'78 Arctic Cat service manual

Panther

Pantera

JAG

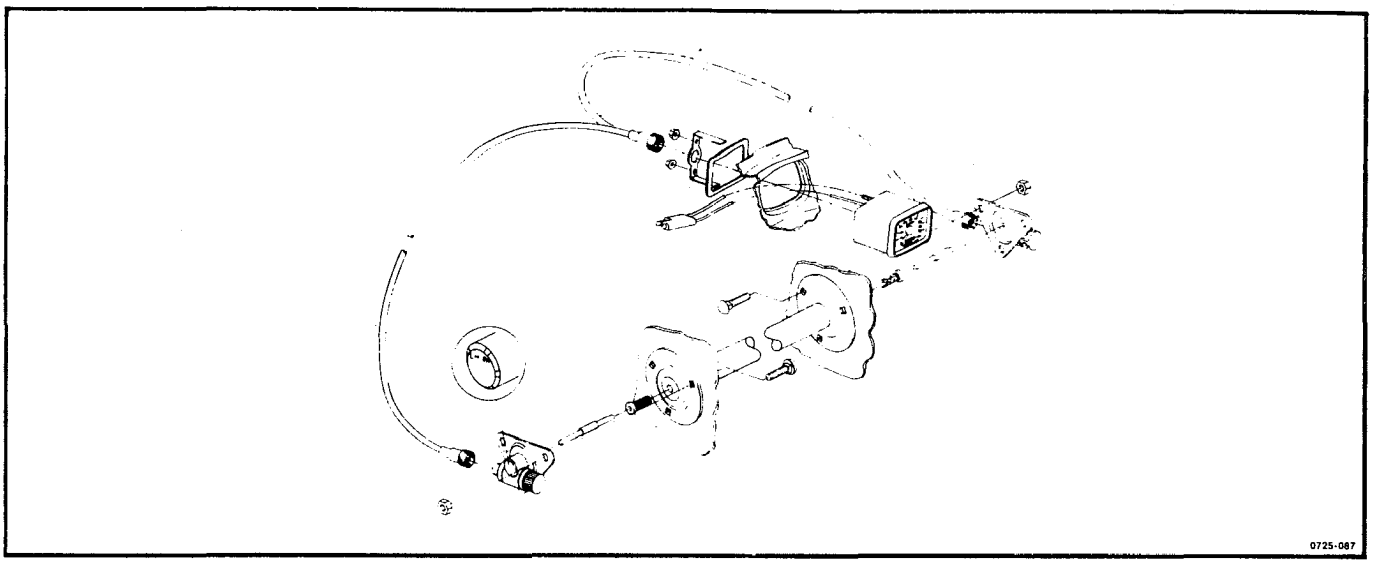
CHEETAH

Lynx

Form No. 0153-072

INSTALLATION INSTRUCTIONS

Speedometer Kit No. 0134-953
(Revised 3-3-77)



Kit consists of the following:

Part No.	Qty.	Description
0123-700	2	Nut, w/Washer
0120-285	1	Speedometer Head
0120-284	1	Drive Adaptor
0120-253	1	Ring Bracket
0120-248	1	Cable, Drive Adaptor
0120-247	1	Bushing, Drive
0120-246	1	Bracket
0120-286	1	Cable, Speedometer Dr.

NOTE: The '77-'78 Pantera models and '77-'78 Lynx models require the use of a cable conversion kit, P.N. 0136-027.

Equipment Necessary: Pliers, Hammer 3/8-inch Wrench, and 1/2-inch Socket.

1. Place the drive bushing in position and drive into the track drive shaft; then insert the short drive adaptor cable.

2. Remove the three lock nuts securing bearing flange on the exposed end of the track drive shaft. DO NOT REMOVE BOLTS.

3. Check the setting of the drive adaptor. The unit can be used for either RH or LH drive. To change setting, just remove cap and place on opposite side of drive adaptor. Use the reference marks on the housings.

4. Connect one end of the speedometer cable to the drive nut.

NOTE: The cable must be threaded through the hole in the front end side plate (just behind tie rod cut-out) on the 1976 Pantera.

5. Remove the dash insert from the console; then slide speedometer head into position.

6. Slide bracket over mounting studs; then secure in place with two lock nuts.

NOTE: For installation on all 1976 models except Jag, the brown harness wire w/terminal must be secured to either mounting stud. For previous models, this is not necessary.

7. Connect the remaining end of speedometer cable to the speedometer head.

8. For all 1976 models except Jag, plug the speedometer harness in main wiring harness. On 1976 Jag and previous models, cut the connector off the speedometer harness; then install the spad-type terminal supplied in the kit on the white w/black wire. Discard the connector.

9. Plug the wire onto an open terminal on the back of the light switch, adjacent to the white w/black wire.

FOREWORD

This comprehensive manual contains service, maintenance and troubleshooting information for the 1978 Pantera, Panther, Cheetah, Jag and Lynx Arctic Cat snowmobiles. The manual is designed to aid service personnel in service-oriented application as well as use as a textbook for service training.

The manual is divided into sections. Each section of the manual covers a specific snowmobile component or system and, in addition to the standard service procedures, includes general troubleshooting and inspection instructions.

The service technician should familiarize himself with the operation and construction of each component or system of the 1978 Pantera, Panther, Cheetah, Jag and Lynx by carefully studying this manual. This manual will assist the service technician to become more aware of and efficient with servicing procedures. Such efficiency not only helps build consumer confidence but saves time and labor too.

At the time of publication, all information, photos and illustrations were technically correct. Because Arctic Enterprises, Inc. constantly refines and improves its products, no retroactive obligation is incurred.

Keep this manual accessible in the shop area for use as a reference tool.

Technical Publications
Arctic Enterprises, Inc.

Thief River Falls, Minnesota 56701

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SECTION 1 — GENERAL INFORMATION

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Break-In Procedure

The 1978 Pantera, Cheetah, Panther, Jag and Lynx snowmobiles require a short break-in when new or after the engine has been overhauled. Strict adherence to the following break-in procedure will contribute to optimum performance and longevity of the Arctic Cat Spirit engine.

For the first ten (10) hours, the engine must not be subjected to heavy load conditions or prolonged full throttle operation. During break-in, a maximum of 3/4 throttle is recommended. Operating speeds should be varied with short bursts of full throttle operation. Do not run the engine at a steady speed or at wide open throttle (WOT) for a prolonged period of time.

After the engine is broken-in, the top speed may gradually be increased.

■ **During any break-in period, only a 25:1 fuel mixture ratio is recommended.**

Fuel Mixing

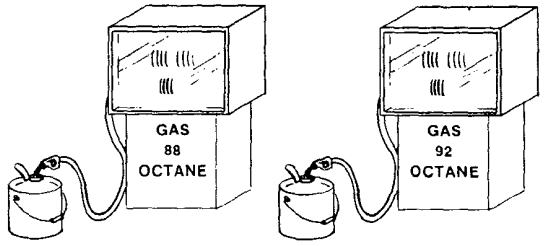
The two-cycle Arctic Cat Spirit engine requires a lubricating oil to be mixed with the gasoline for lubrication and internal engine cooling. The oil is used to lubricate the crankshaft, connecting rods, bearings, pistons and cylinder walls; excessive wear will also be prevented. Because of the importance of a good engine lubricant, Arctic recommends the following fuel and oil:

Fuel	88 Octane minimum - Pantera FC, Panther, Cheetah, Jag, Lynx 92 Octane minimum - Pantera FA
Oil	Arctic Spirit 50:1*

*If this oil is not available, use a good quality SAE 30 W snowmobile oil.

● CAUTION ●

The 1978 Arctic Cat snowmobile carburetors have been calibrated for a mixture of gasoline (88 octane minimum, 92 octane minimum) and Arctic Cat Snowmobile Oil. Therefore, unless absolutely necessary DO NOT use regular brand snowmobile oils. If regular brand snowmobile oil is used, however, mix gasoline (88 octane minimum, 92 octane minimum) and oil using a 20:1 ratio (20 parts gasoline to 1 part oil). DO NOT use outboard motor oil or regular mineral oils because engine damage will likely result.



PANTERA FC
PANTHER, CHEETAH
JAG, LYNX

PANTERA FA

0725-022

The correct ratio of gasoline to oil is 50:1 (fifty parts of 88 or 92 octane minimum grade gasoline with one part of snowmobile oil). This is equivalent to one pint of Arctic Spirit 50:1 oil to 6 US gallons of gasoline.

Genuine Parts

When replacement of a part is necessary, use only genuine Arctic Cat replacement parts. They are precision-made to ensure high quality and correct fit. Refer to the 1978 Pantera Parts Manual (Form No. 0185-107), Panther Parts Manual (Form No. 0185-104), Cheetah Parts Manual (Form No. 0185-103), Jag Parts Manual (Form No. 0185-102) or the Lynx Parts Manual (Form No. 0185-101) for the correct part number, quantity needed and description.

Summer Storage

Prior to storing the snowmobile for the summer, it must be properly serviced to prevent rusting and component deterioration. Arctic recommends the following procedure to prepare the snowmobile for storage.

1. Remove the seat cushion from the tunnel. Wash the cushion with a damp rag and store the cushion in a dry place.

NOTE: On some models the cushion can not be removed, clean with the seat in place.

2. Thoroughly clean all dirt, oil, grass and other foreign matter from all areas of the snowmobile, being careful to keep water out of any part of the engine or intake silencer.

3. Drain all fuel from the tank(s); then allow the engine to idle until it stops from lack of fuel.

4. Plug the hole in the muffler and air intake silencer with clean rags.

5. Remove the spark plugs from the cylinder head. Pull the recoil until the piston reaches TDC; then pour one ounce of Arctic Cat Engine Preservative or snowmobile oil into the spark plug hole. Repeat on the opposite cylinder and install spark plugs. Pull the recoil several times.

6. Remove the chain case cover and drain the lubricant. Install the cover and pour 8 ounces of Arctic Chain Lube into the filler hole.

7. Remove the drive belt and place in a cardboard sleeve.

8. Check the drive clutch and driven pulley for wear.

9. Apply a light coat of oil on all steering post bushings, ski spindles and the front and rear arm pivot bushings of the skid frame.

10. Lubricate the grease fittings on the rear arm of the skid frame and the lower steering post brackets with a low-temperature grease.

NOTE: Lube grease fittings on front arm if so equipped.

11. Loosen the track tension bolts and rotate the track occasionally during the storage period.

12. Tighten all nuts, bolts and screws.

13. Clean and polish the hood, console and chassis with an automotive cleaner wax.

NOTE: Do not use spray waxes containing silicone. Silicone will damage plastic parts.

14. Block the entire machine off the ground and use a cover to protect it from dust and dirt.

SECTION 2 — SPECIFICATIONS

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GENERAL SPECIFICATIONS

ITEM	PANTERA FC	PANTERA FA	PANTHER 4000 5000	CHEETAH 5000	JAG 2000	JAG 3000	LYNX T	LYNX S
Length cm	261	261	265	258	257	257	241	241
w/Skis in.	103	103	104.5	102	101.5	101.5	95	95
Height cm	107	107	107	107	100	100	107	107
w/Windshield in.	42	42	42	42	39.5	39.5	42	42
Height w/o cm	81	81	85	85	82	82	82	82
Windshield in.	32	32	33.5	33.5	32.5	32.5	32.5	32.5
Overall cm	96	96	86	86	86	86	84	84
Width in.	38	38	34	34	34	34	33	33
Track cm	41	41	43	43	38	38	38	38
Width in.	16	16	17	17	15	15	15	15
Curb kg	199	207	198	194	183	183	175	166
Weight lb	438	457	436	427	403	403	385	365
Dry kg	176	173	180	176	165	165	154	146
Weight lb	389	381	396	387	365	365	340	322
Fuel Tank L	26.9	26.9 or 38.2	24.6	24.6	24.6	24.6	24.6	24.6
Capacity US gal	7.1	7.1 or 10.1	6.5	6.5	6.5	6.5	6.5	6.5
Ski cm	76	76	66	66	71	71	69	69
Centers in.	30	30	26	26	28	28	27	27
Brake Type	Caliper Disc	Caliper Disc	Caliper Disc	Caliper Disc	Caliper Disc	Caliper Disc	Caliper Disc	Caliper Disc

ENGINE SPECIFICATIONS

ITEM	PANTERA FC	PANTERA FA	PANTHER 4000	PAN/CHE 5000	JAG 2000	JAG 3000	LYNX T	LYNX S
Model	AE50A2	AC50F2	AC44A3	AB50A3	AA28F3	AA34F3	AA28F2/F3	AB25F1
Type	2 cycle	2 cycle	2 cycle	2 cycle	2 cycle	2 cycle	2 cycle	2 cycle
No. of Cylinders	2	2	2	2	2	2	2	1
Lubrication System	Gas/Oil Mix	Gas/Oil Mix	Gas/Oil Mix	Gas/Oil Mix	Gas/Oil Mix	Gas/Oil Mix	Gas/Oil Mix	Gas/Oil Mix
Manual Start	Std.	Std.	Std.	Std.	Std.	Std.	Std.	Std.
Electric Start	Optional	N/A	Optional	Optional	Optional	Optional	N/A	N/A
Bore (mm) (in.)	70 2.756	70 2.756	65 2.559	70 2.756	54 2.126	60 2.362	54 2.126	70 2.756
Stroke (mm) (in.)	65 2.559	65 2.559	65 2.559	65 2.559	60 2.362	60 2.362	60 2.362	65 2.559
Displacement (cc) (cu in.)	500 30.50	500 30.50	431 26.29	500 30.50	275 16.77	339 20.67	275 16.77	250 15.25
Compression Ratio	6.5:1	6.9:1	6.6:1	6.5:1	6.5:1	6.8:1	6.5:1	6.8:1
Piston Ring End Gap Wear Limit (mm) (in.)	0.20 - 0.83 0.008 - 0.033	0.20 - 0.83 0.008 - 0.033	0.15 - 0.80 0.006 - 0.031	0.20 - 0.83 0.008 - 0.033	0.15 - 0.80 0.006 - 0.031	0.15 - 0.80 0.006 - 0.031	0.15 - 0.80 0.006 - 0.031	0.20 - 0.83 0.008 - 0.033
Piston Skirt/ Cylinder Clearance* (mm) (in.)	0.05 - 0.06 0.0020 - 0.0025	0.05 - 0.06 0.0020-0.0025	0.05 - 0.06 0.0020-0.0025	0.05 - 0.06 0.0020-0.0025	0.04 - 0.06 0.0015-0.0025	0.04 - 0.06 0.0015-0.0020	0.04 - 0.06 0.0015-0.0025	0.05 - 0.06 0.0020-0.0025
Piston Pin Diameters (mm) (in.)	18 0.7085-0.7087	18 0.7085-0.7087	18 0.7085-0.7087	18 0.7085-0.7087	16 0.6297-0.6299	16 0.6297-0.6299	16 0.6297-0.6299	18 0.7085-0.7087
Piston Pin Bore Diameters (mm) (in.)	18 0.7085-0.7089	18 0.7085-0.7089	18 0.7085-0.7089	18 0.7085-0.7089	16 0.6298-0.6301	16 0.6298-0.6301	16 0.6298-0.6301	18 0.7085-0.7089
Connecting Rod Small End Diameter (mm) (in.)	23.00-23.03 0.9059-0.9067	23.00-23.03 0.9059-0.9067	23.00-23.03 0.9059-0.9067	23.00-23.03 0.9059-0.9067	21.00-21.01 0.8268-0.8273	21.00-21.01 0.8268-0.8273	21.00-21.01 0.8268-0.8273	23.00-23.03 0.9059-0.9067
Connecting Rod Radial Play (mm) (in.)	0.02-0.03 0.0008-0.0012	0.02-0.03 0.0008-0.0012	0.02-0.03 0.0008-0.0012	0.02-0.03 0.0008-0.0012	0.02-0.03 0.0008-0.0012	0.02-0.03 0.0008-0.0012	0.02-0.03 0.0008-0.0012	0.02-0.03 0.0008-0.0012
Crankshaft End Play (mm) (in.)	0.05-0.10 0.002-0.004	0.05-0.10 0.002-0.004	0.05-0.10 0.002-0.004	0.05-0.10 0.002-0.004	0.05-0.10 0.002-0.004	0.05-0.10 0.002-0.004	0.05-0.10 0.002-0.004	0.05-0.10 0.002-0.004
Crankshaft Runout (mm) (in.)	0.05 0.002	0.05 0.002	0.05 0.002	0.05 0.002	0.06 0.002	0.05 0.002	0.05 0.002	0.05 0.002

*The specifications in the above chart are manufacturing tolerances. The piston skirt/cylinder clearance wear limit for all models is 0.15 mm or 0.006 of an inch.

DRIVE SYS SPECIFICATIONS

ITEM	PANTERA FC	PANTERA FA	PANTHER 4000	PAN/CHE 5000	JAG 2000	JAG 3000	LYNX T	LYNX S
DRIVE CLUTCH:								
Engagement Speed - rpm	2600	3300	3300	3400	3400	3200	3400	3200
Weight Color/ Part Number	Yellow 0146-123	Black 0146-105	Yellow 0146-307	Red 0146-286	White 0146-104	Black 0146-105	White 0146-104	Yellow 0146-123
Spring Color/ Part Number	Green 0146-068	Green 0146-068	Red 0146-313	Green 0146-068	Green 0146-068	Yellow 0146-067	Green 0146-068	Yellow 0146-067
Roller Assembly Part Number	0146-355	0146-355	0146-214	0146-355	0146-355	0146-214	0146-355	0146-355
Ramp Part Number	0146-362	0146-294	0146-290	0146-294	0146-294	0146-290	0146-294	0146-294
Drive Clutch/ Driven Pulley Center-to-Center Distance (cm)	30.5	30.5	25.9	25.9	28.9	28.9	25.9	25.9
(in.)	12.0	12.0	10.2	10.2	11.375	11.375	10.2	10.2
Drive Clutch/ Driven Pulley Offset (mm)	11.5	11.5	11.5	11.5	11.5	11.5	11.5	11.5
(in.)	0.454	0.454	0.454	0.454	0.454	0.454	0.454	0.454
DRIVE BELT:								
Part Number	0227-020	0227-020	0227-007	0227-019	0227-014	0227-014	0227-007	0227-007
Belt Width (cm)	3.17	3.17	3.17	3.17	3.17	3.17	3.17	3.17
(in.)	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25
Outside Circumference (cm)	118.6	118.6	109.8	109.8	115.6	115.6	109.8	109.8
(in.)	46.7	46.7	43.25	43.25	45.5	45.5	43.25	43.25
Belt Taper Angle	$26^{\circ}\ ^{+3}_{-2}$	$26^{\circ}\ ^{+3}_{-2}$	$28^{\circ}\ ^{+3}_{-2}$	$28^{\circ}\ ^{+3}_{-2}$	$28^{\circ}\ ^{+3}_{-2}$	$28^{\circ}\ ^{+3}_{-2}$	$28^{\circ}\ ^{+3}_{-2}$	$28^{\circ}\ ^{+3}_{-2}$
CHAIN AND SPROCKETS:								
Sprocket-Top/Bottom	18/33	20/35	21/33	21/33	19/39	20/39	19/39	19/39
Chain Pitch	66	68	90	90	70	70	90	90

FUEL SYSTEM SPECIFICATIONS

ITEM	PANTERA FC	PANTERA FA	PANTHER 4000	PAN/CHE 5000	JAG 2000	JAG 3000	LYNX T	LYNX S
Carburetor Type	Mikuni VM-34	Mikuni VM-32	Mikuni VM-34	Mikuni VM-34	Mikuni VM-30	Mikuni VM-30	Mikuni VM-30	Mikuni VM-30
No. of Carburetors	1	2	1	1	1	1	1	1
Venturi Dia. (mm)	34	32	34	34	30	30	30	30
(in.)	1.33	1.25	1.33	1.33	1.18	1.18	1.18	1.18
Main Jet	300	350	270	280	180	210	160	160
Pilot Jet	22.5	30	30	25	20	25	20	20
Jet Needle	6DH4-4	6DH7-4	6DH4-3	6DH8-2	5DP7-3	5DP7-3	5DP7-3	5DP7-3
Needle Jet	Q-0 (166)	Q-0 (159)	P-6 (251)	P-6 (251)	P-0 (169)	P-4 (169)	P-0 (169)	P-4 (169)
Cutaway	3.0	3.5	2.5	3.0	2.0	2.5	2.0	2.0
Inlet Seat	1.5	1.2	1.5	1.5	1.5	1.5	1.5	1.5
Air Screw - Turns Out	1-1/2	1	3/4	1-1/4	1-1/2	1-1/2	1-1/2	1-1/2
Fuel Pump Part Number	0109-875	0109-780	0109-875	0109-875	0109-887	0109-887	0109-887	0109-887
Recommended Fuel - Min. Octane	88	92	88	88	88	88	88	88
Mixing Ratio -								
-- Spirit Oil	50:1	50:1	50:1	50:1	50:1	50:1	50:1	50:1
-- Other Oil	20:1	20:1	20:1	20:1	20:1	20:1	20:1	20:1
Engine Break-In Ratio w/Spirit Oil	25:1	25:1	25:1	25:1	25:1	25:1	25:1	25:1

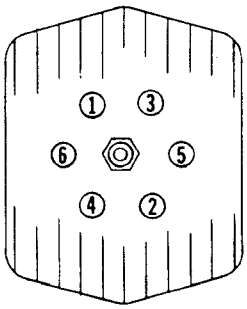
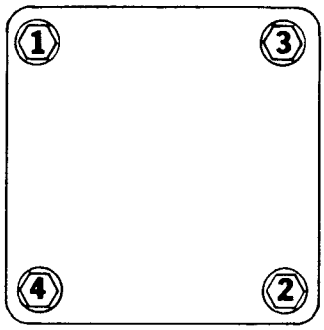
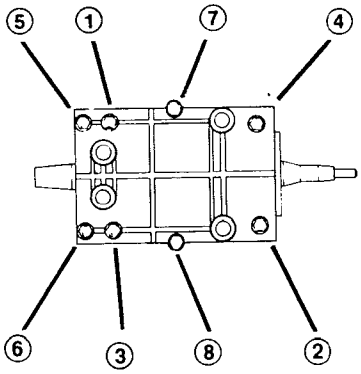
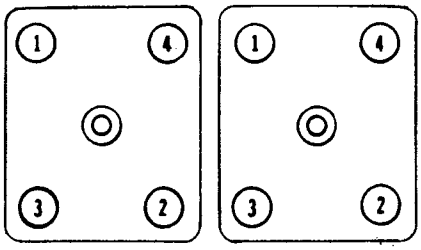
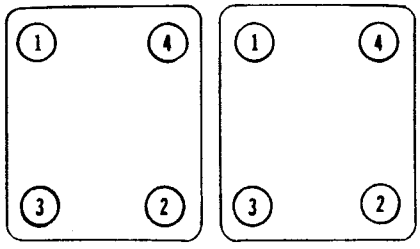
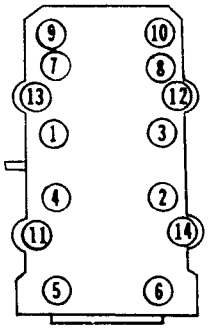
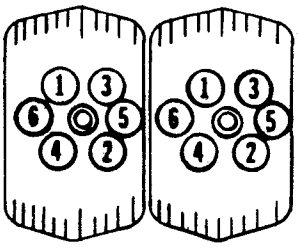
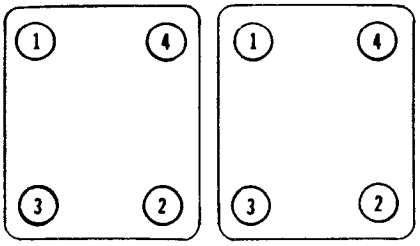
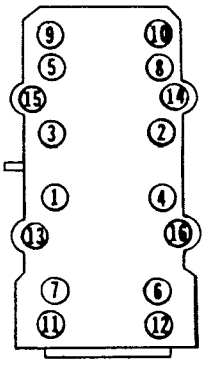
IGNITION SYSTEM SPECIFICATIONS

ITEM	PANTERA FC	PANTERA FA	PANTHER 4000	PAN/CHE 5000	JAG 2000	JAG 3000	LYNX T	LYNX T	LYNX S
Ignition Type	Nippon Denso CDI	Kokusan CDI	Nippon Denso CDI	Nippen Denso CDI	Kokusan CDI	Kokusan CDI	Kokusan CDI	Nippon Denso CDI	Nippon Denso Breaker Point
Volt/Watt	12/150	12/120	12/150	12/150	12/120	12/120	12/120	12/120	12/120
Ignition Timing —Degree BTDC —mm BTDC —in. BTDC	 18° @6000 2.02 0.080	 20° @6000 2.49 0.098	 18° @6000 2.02 0.080	 18° @6000 2.02 0.080	 16° @6000 1.44 0.056	 16° @6000 1.44 0.056	 16° @6000 1.44 0.056	 18° @6000 1.86 0.073	 22° @6000 3.00 0.118
Spark Plug-Std.	BR9ES NGK	BR9ES NGK	BR8ES NGK	BR9ES NGK	BR8ES NGK	BR8ES NGK	BR8ES NGK	BR8ES NGK	BR9ES NGK
Spark Plug Gap (mm) (in.)	0.5 0.020	0.5 0.020	0.5 0.020	0.5 0.020	0.5 0.020	0.5 0.020	0.5 0.020	0.5 0.020	0.5 0.020
Plug Cap Resistance - ohms	 5k	 10k	 5k	 5k	 5k	 5k	 5k	 10k	 10k
Ignition Coil — Primary Resistance (ohm) — Secondary Resistance (ohms)	 0.3 1.4k	 0.23 1.4k	 0.3 1.4k	 0.3 1.4k	 0.22 5.8k	 0.22 5.8k	 0.22 5.8k	 0.22 5.8k	 0.9 7.6k
Charge/Trigger Coil Resistance (ohms)	Charge 200 Trigger 32	Charge 127 Trigger 31	Charge 200 Trigger 32	Charge 200 Trigger 32	Charge 127 Trigger 44	Charge 127 Trigger 44	Charge 127 Trigger 44	Charge 127 Trigger 44	3.82 Excitor
Lighting Coil Resistance (ohm)	 0.17	 0.18	 0.17	 0.17	 0.18	 0.18	 0.18	 0.18	 0.14
Condenser Capacity	—	—	—	—	—	—	—	—	0.3 micro farad
Condensor Series Resistance	—	—	—	—	—	—	—	—	Less than 1 ohm
Condenser Leakage	—	—	—	—	—	—	—	—	20 megohms

ENGINE FASTENING TORQUE SPECIFICATIONS

ITEM		PANTERA FC	PANTERA FA	PANTHER 4000	PAN/CHE 5000	JAG 2000	JAG 3000	LYNX T	LYNX S
Cylinder Head	kg-m	1.8 - 2.2	1.8 - 2.2	1.8 - 2.2	1.8 - 2.2	3.0 - 4.0	3.0 - 4.0	3.0 - 4.0	1.8 - 2.2
	ft-lb	13 - 16	13 - 16	13 - 16	13 - 16	22 - 29	22 - 29	22 - 29	13 - 16
Cylinder Base	kg-m	3.0 - 4.0	3.0 - 4.0	3.0 - 4.0	3.0 - 4.0	3.0 - 4.0	3.0 - 4.0	3.0 - 4.0	3.0 - 4.0
	ft-lb	22 - 29	22 - 29	22 - 29	22 - 29	22 - 29	22 - 29	22 - 29	22 - 29
Crankcase 6 mm	kg-m	0.8 - 1.0	0.8 - 1.0	0.8 - 1.0	0.8 - 1.0	0.8 - 1.0	0.8 - 1.0	0.8 - 1.0	0.8 - 1.0
	ft-lb	6 - 7	6 - 7	6 - 7	6 - 7	6 - 7	6 - 7	6 - 7	6 - 7
Crankcase 8 mm	kg-m	1.8 - 2.2	1.8 - 2.2	1.8 - 2.2	1.8 - 2.2	1.8 - 2.2	1.8 - 2.2	1.8 - 2.2	1.8 - 2.2
	ft-lb	13 - 16	13 - 16	13 - 16	13 - 16	13 - 16	13 - 16	13 - 16	13 - 16
Crankcase 10 mm	kg-m	2.0 - 3.0	2.0 - 3.0	2.0 - 3.0	2.0 - 3.0	2.0 - 3.0	2.0 - 3.0	2.0 - 3.0	2.0 - 3.0
	ft-lb	15 - 22	15 - 22	15 - 22	15 - 22	15 - 22	15 - 22	15 - 22	15 - 22
Flywheel	kg-m	6.8 - 8.7	6.8 - 8.7	6.8 - 8.7	6.8 - 8.7	6.8 - 8.7	6.8 - 8.7	6.8 - 8.7	6.8 - 8.7
	ft-lb	49 - 63	49 - 63	49 - 63	49 - 63	49 - 63	49 - 63	49 - 63	49 - 63
Intake Manifold	kg-m	1.5 - 1.9	1.5 - 1.9	1.5 - 1.9	1.5 - 1.9	1.5 - 1.9	1.5 - 1.9	1.5 - 1.9	1.5 - 1.9
	ft-lb	11 - 14	11 - 14	11 - 14	11 - 14	11 - 14	11 - 14	11 - 14	11 - 14
Exhaust Manifold	kg-m	1.5 - 1.9	1.5 - 1.9	1.5 - 1.9	1.5 - 1.9	1.5 - 1.9	1.5 - 1.9	1.5 - 1.9	1.5 - 1.9
	ft-lb	11 - 14	11 - 14	11 - 14	11 - 14	11 - 14	11 - 14	11 - 14	11 - 14
Engine Mounting Bolts	kg-m	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6
	ft-lb	55	55	55	55	55	55	55	55
Spark Plug	kg-m	2.5 - 2.8	2.5 - 2.8	2.5 - 2.8	2.5 - 2.8	2.5 - 2.8	2.5 - 2.8	2.5 - 2.8	2.5 - 2.8
	ft-lb	18 - 20	18 - 20	18 - 20	18 - 20	18 - 20	18 - 20	18 - 20	18 - 20

Engine Torque Patterns

CYLINDER HEAD	CYLINDER BASE	CRANKCASE
		
Lynx 2000 S		
		
Lynx 2000 T, Jag 2000, Jag 3000		
		
Pantera, Panther, Cheetah		

SECTION 3 — SET-UP AND PRE-DELIVERY

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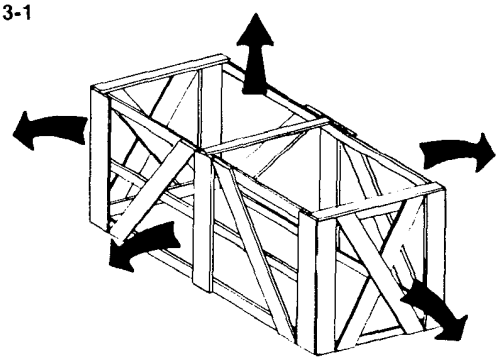
Remove Snowmobile From Crate

Pantera

1. Set the crate on a flat surface.
2. Remove the top and four sides of the crate; then remove the parts package around the snowmobile, the individually packaged parts and the mounting hardware located in the toolbox.

Fig. 3-1



0725-327

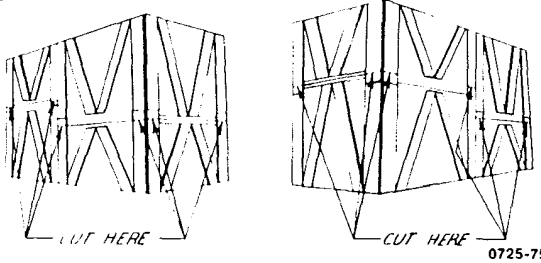
3. Remove all mounting hardware securing the snowmobile to base of crate; then remove snowmobile.

Panther, Cheetah, Jag and Lynx

1. Set crate on a flat surface.
2. Using a circular power saw with the depth adjustment set at 5/8-inch, cut the two overlapping boards at the center, ends and sides of the crate. Cut only one (1) side at this time.

NOTE: There are a total of six (6) cuts that must be made on each side of the crate.

Fig. 3-2



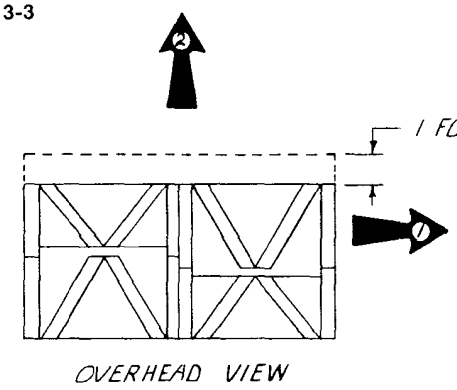
0725-753

3. Carefully tip the crate on the side that was cut. Refer to note below for tipping instructions.

NOTE: Use steps 4-7 for use of a forklift or steps 8-9 if tipped manually.

4. Hook a chain to the corner of the top crate; then hook the chain to one of the forks.
5. Raise the forks until the chain is tight.
6. Slowly back the forklift until crate begins to tip. Continue backing until crate is over center.
7. Slowly lower the forks until the crate is lying on the side that was cut; then proceed to step 10.
8. With a person on each side of the crate, begin to tip the crate to the side that was cut. Continue until crate is just about balanced on the bottom side.
9. Grasp and slowly tip the crate to the floor. DO NOT LET THE CRATE DROP.
10. Repeat step 2 on the opposite side of the crate.
11. Slide each crate about a foot forward to clear the handlebars; then slide the crates apart.

Fig. 3-3



0725-756

12. Carefully tip the snowmobiles upright. DO NOT LET THE CRATES DROP.
13. Remove the top and side boards from the crate.
14. Remove the back brackets.
15. Remove the nuts securing the snowmobile to the base of the crate.
16. Remove the nuts securing the eyebolts to the ski spindles; then remove the eyebolts.
17. Remove the snowmobile from the base of the crate.

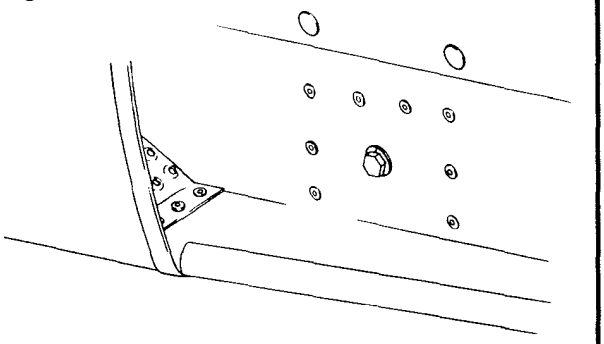
Install Skid Frame

Pantera, Panther, Cheetah, Jag, Lynx

1. Tip snowmobile on its side using cardboard to protect against scratching.

2. Move the front mounting arm of the skid frame into position with the front mounting hole in the tunnel, Fig. 3-4. Secure in place with a cap screw and lock washer. DO NOT TIGHTEN CAP SCREW.

Fig. 3-4



0725-017

NOTE: To aid in centering the front arm with the mounting holes in the tunnel, position the skid frame at a 45 degree angle in relation to the bottom of the tunnel.

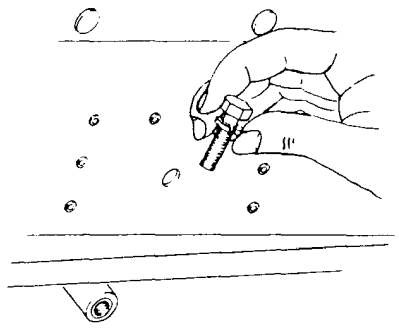
3. Push the track, skid frame and tunnel together; then carefully tip the snowmobile on its opposite side using cardboard to protect against scratching.

4. Secure the front mounting arm to the tunnel following the directions in step 2.

5. Move the rear mounting arm of the skid frame into position with the rear mounting holes in the tunnel, Fig. 5. Secure in place with a cap screw and lock washer. DO NOT TIGHTEN CAP SCREW.

NOTE: The rear mounting arm of the skid frame may not line up with the holes in the tunnel. To obtain rear mounting arm and mounting hole alignment, drive the rear mounting arm until alignment is obtained.

Fig. 3-5



0725-018

6. Tip snowmobile on opposite side. Secure the rear mounting arm to the tunnel following directions given in step 5; then tip the snowmobile upright.

7. Tighten the four skid frame mounting cap screws to 2.9-3.6 kg-m or 21-26 ft-lb.

NOTE: Be sure to grease the rear arm telescopes frequently. Grease fittings are provided on the rear arms.

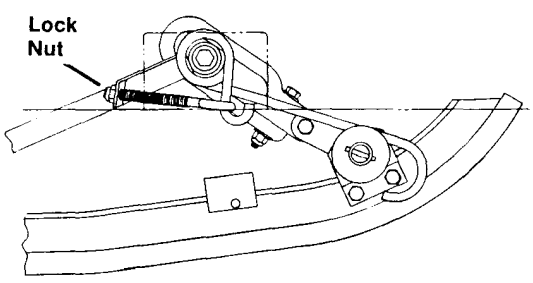
Install Eyebolts

Pantera FC

1. Tip snowmobile on its side using cardboard to protect against scratching.

2. Using a 4-9/16 inch eyebolt from hardware package, secure the front spring to front arm eyebolt flange.

Fig. 3-6



0725-685

3. Tip snowmobile on opposite side using cardboard to protect against scratching.

4. Repeat step 2 on opposite side spring.

5. On late production snowmobiles, it will be necessary to secure the rear suspension spring on the adjustment cam. Be sure the cams are adjusted equally.

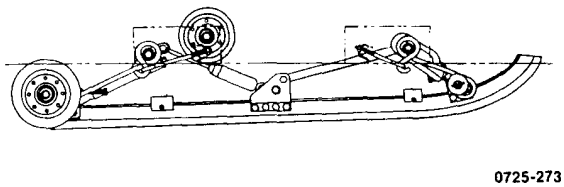
6. Adjust suspension (See: Suspension Adjustment, page 00).

Pantera FA

1. Tip the snowmobile on its side using cardboard to protect against scratching.

2. Using a 4-9/16 inch eyebolt and lock nut from the hardware package, secure the front spring to tunnel weldment.

Fig. 3-7



0725-273

3. Using a 6-1/4 inch eyebolt and lock nut from the hardware package, secure the rear spring to the tunnel weldment.

4. Tip the snowmobile on the opposite side using cardboard to protect against scratching.

5. Repeat steps 2 and 3 on opposite side springs.

6. Adjust suspension (See: Suspension Adjustment, page 00).

Install Skis

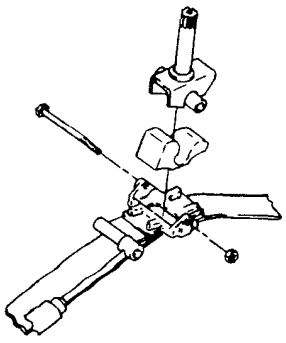
Pantera

1. Remove the two ski assemblies from the crate.

2. Tip the snowmobile on its side using cardboard to protect against scratching.

3. Place a rubber damper between the spindle and ski saddle.

Fig. 3-8



0725-325

4. Place ski in position.

NOTE: Threaded hole in ski saddle is positioned to the inside; therefore, start the cap screw from the outside of the saddle.

5. Apply low-temperature grease to the non-threaded portion of the cap screw. Tighten to 2.9-3.6 kg-m or 21-26 ft-lb. Thread lock nut onto cap screw and tighten to 2.9-3.6 kg-m or 21-26 ft-lb.

6. Tip snowmobile on its remaining side. Install the remaining ski assembly on the ski spindle following directions in steps 3-5.

7. Tip the snowmobile upright.

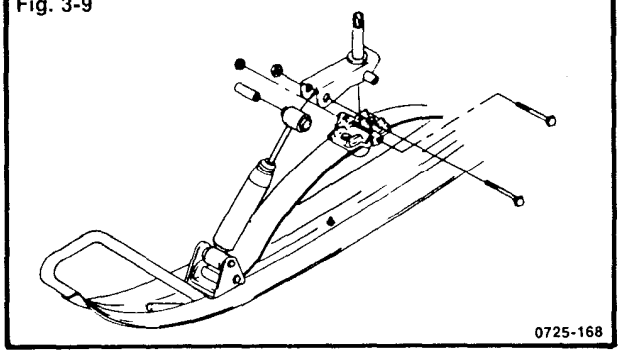
Panther, Cheetah, Jag, Lynx

1. Remove the two skis from the crate.

2. Tip the snowmobile on its side using cardboard to protect against scratching.

3. Place the ski in position.

Fig. 3-9



0725-168

4. Apply low-temperature grease to the non-threaded portion of the cap screw. Secure the ski in place with the cap screw. Tighten to 2.9-3.6 kg-m or 21-26 ft-lb. Thread lock nut onto the cap screw and tighten to 2.9-3.6 kg-m or 21-26 ft-lb.

5. Apply low-temperature grease to the non-threaded portion of the cap screw that holds the moveable end of the shock absorber to spindle bracket.

NOTE: On the Lynx models, the shock absorber is an optional item and can be obtained through your Arctic Cat dealer (part no. 0134-874).

6. Slide a short sleeve through the moveable end of the shock absorber; then position the end between the spindle bracket. Secure in place with cap screw and lock nut making sure the cap screw is started from the outside of the spindle bracket. Tighten the lock nut 4.4-5.3 kg-m or 32-38 ft-lb.

7. Tip the snowmobile on its opposite side. Install the remaining ski assembly on the ski spindle following the directions given in steps 3-6.

8. Tip the snowmobile upright.

Install Windshield

Pantera, Panther, Cheetah, Jag, Lynx

1. Remove the windshield from the package on snowmobile.

2. Push the rubber well-nuts into the mounting holes in the hood.

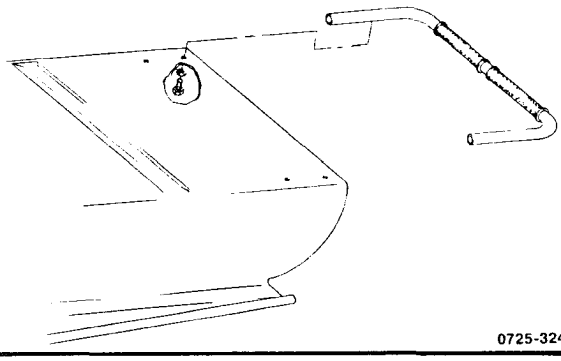
3. On the Pantera, Panther and Cheetah models, position the windshield and trim in place with two phillips screws on each side of center. On Jag and Lynx models, position the windshield (no trim strip) in place with two phillips screws on each side of center. Install all the windshield screws; then tighten all screws working from the center to the outside.

Install Rear Bumper Pantera

1. Remove the rear bumper, stored for shipment below the seat.

2. Slide the bumper ends through the cut-outs in the rear shroud.

Fig. 3-10



3. Viewing the mounting holes from the underside of the tunnel, insert the bumper until mounting holes are aligned with the holes in the tunnel.

4. Secure the rear bumper to the tunnel using four cap screws and washers. Tighten the cap screws to 0.6-0.9 kg-m or 4-6 ft-lb.

NOTE: DO NOT lift machine by rear bumper before the cap screws are tightened.

Install Front Bumper Pantera

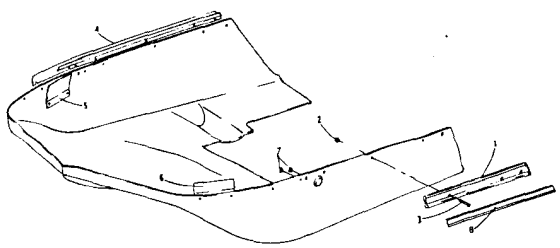
1. Tilt the hood forward.

2. Remove the four machine screws which secure the belly pan to the axle ends and footrests. The screws will be used in securing bumper in place.

NOTE: Use a washer on inside of belly pan whenever a nut would be in direct contact with the belly pan.

3. Place front bumper in position on belly pan.

Fig. 3-11



0725-400

4. Begin inserting the machine screws that secure bumper to belly pan. Place the PTO and MAG side hood channels in place; then install lock nuts on the front bumper bolts.

NOTE: Be sure to correctly position the high (Fig. 3-11, Ref. 6) and low (Fig. 3-11, Ref. 5) hood channels on the belly pan. Also, the wiring harness clip for the light is secured to the front bolt on the high channel.

5. When front bumper is in place, clean the bumper tape surface with solvent. Slowly remove the protective backing from the tape and guide the strip onto the bumper surface.

6. Trim the ends of the bumper strip with a knife.

Final Delivery Instructions

1. Test ride the snowmobile checking all electrical and mechanical functions:

2. Check the brake for correct operation. Adjust if necessary.

3. After the engine has been run for 1/2 hour, tighten cylinder head nuts on free-air models to the proper torque values.

4. Make sure all safety decals are in place and clearly legible.

5. Check toolbox for all operator printed material, warranty registration form and tool kit.

6. Clean and polish the snowmobile just prior to pick-up or delivery.

7. Instruct customer on the operation, maintenance and safety features of the snowmobile.

8. Explain the Warranty Policy.

9. Instruct the customer to read the Operator's Manual and Safety Handbook.

SECTION 4 — ENGINE

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General

The engines used in the 1978 model snowmobile can be divided into four basic groups:

1. Single cylinder - Lynx S
2. Twin cylinder free air - Lynx T, Jag
3. Twin cylinder free air - Pantera FA
4. Twin cylinder fan cooled - Pantera FC, Panther and Cheetah

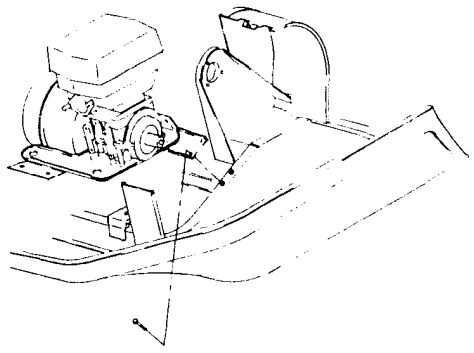
This section will deal with disassembly, inspection and assembly of each engine. Throughout this section the engine model numbers will be used to distinguish particular engine differences. Snowmobile models and corresponding engine models are listed below.

Snowmobile Model	Engine Model
Lynx S	AB25F1/F2
Lynx T	AA28F2/F3
Jag 2000	AA28F3
Jag 3000	AA34F3
Panther 4000	AC44A3
Panther 5000	AB50A3
Cheetah 5000	AB50A3
Pantera FA	AC50F2
Pantera FC	AE50A2

Lynx Engine Removal

1. Remove the two push nuts and pins securing the hood; then disconnect the hood cable.
2. Disconnect the headlight harness and remove the hood.
3. Remove the four bolts and lock washers securing recoil.
4. Disconnect the engine wire plug from the main wiring harness.
5. Remove the nuts and washers securing the exhaust manifold.
6. Remove the two pins securing the clutch shield; then remove shield. Remove the drive belt.
7. Loosen the carburetor flange clamp and slide carburetor out of flange; then disconnect the fuel pump impulse line from the crankcase.
8. Remove the four cap screws securing the rear engine motor bracket.

Fig. 4-1



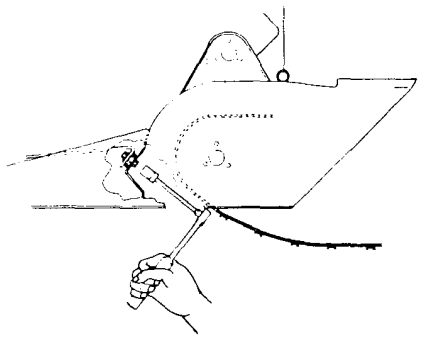
0725-507

9. Remove the two front motor mount cap screws.
10. Lift the motor plate assembly free of the chassis.
11. Remove the cap screw securing the drive clutch to the crankshaft. Using the special Arctic drive clutch puller (part no. 0144-110), remove the drive clutch.
12. Remove the four cap screws securing the engine to the motor plate.

Jag
Engine Removal

1. Remove the hood hinge E-ring and disconnect the two hood cables.
2. Disconnect the headlight harness and remove the hood.
3. Remove the four bolts and lock washers securing recoil.
4. Disconnect the engine wire plug from the main harness.
5. Remove the four nuts and washers securing the exhaust manifold.
6. Remove the drive belt from the clutches.
7. Loosen the carburetor flange clamp and slide carburetor out of flange; then disconnect the fuel pump impulse line from the crankcase.
8. Tip the snowmobile on the MAG side. Remove the two rear engine mounting nuts.

Fig. 4-2



0725-066

9. Tip the snowmobile upright; then remove the three front motor mount nuts. Lift engine out of chassis.
10. Remove motor plate from engine.

Panther/Cheetah
Engine Removal

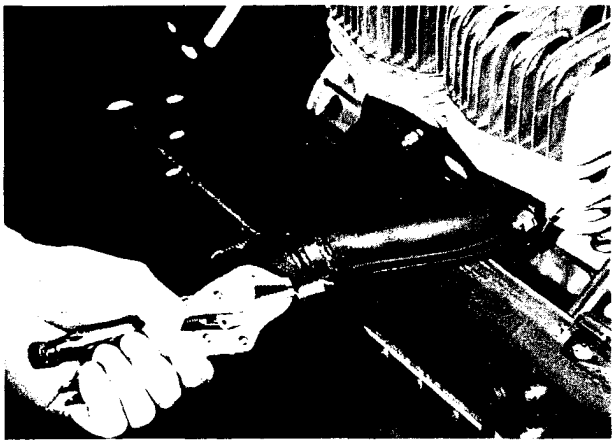
1. Open the hood. Remove the pins securing belt guard; then remove guard.
2. Remove the drive belt from the drive clutch and driven pulley.
3. Loosen the carburetor flange clamp; then slide carburetor free of flange.
4. Disconnect the fuel pump impulse line from the crankcase fitting.
5. Disconnect the main harness from the engine connector.
6. Remove the four cap screws securing the recoil in position; then place recoil in belly pan.
7. Tip the snowmobile on the side. Remove the lock nuts and washers from the two rear motor mounts.
8. Tip the snowmobile upright. Remove the lock nuts and washers from the two front motor mounts. Lift engine out of chassis.
9. Remove drive clutch bolt and lock washer; then remove drive clutch using the Arctic clutch puller (part no. 0144-110).
10. Remove the four cap screws and lock washers securing motor plate to the engine; then remove motor plate.
11. Disconnect the two springs securing the muffler to the manifold. Remove the four nuts and washers securing exhaust manifold to the engine; then remove manifold.

Pantera Engine Removal

1. Remove the hood.

2. Remove the springs securing pulse charger to exhaust manifold.

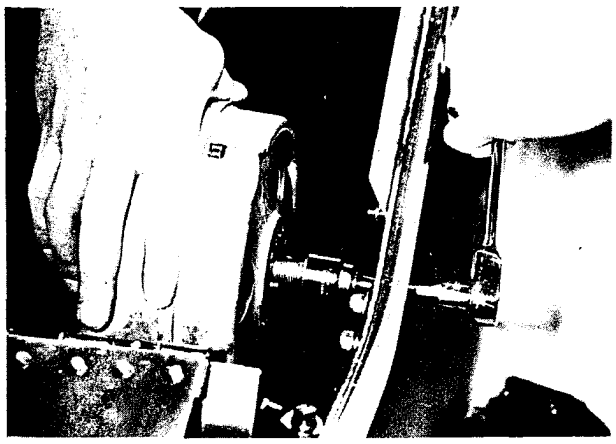
Fig. 4-3



A398

3. Remove the drive clutch from the engine with the aid of the Arctic clutch puller (part no. 0144-110).

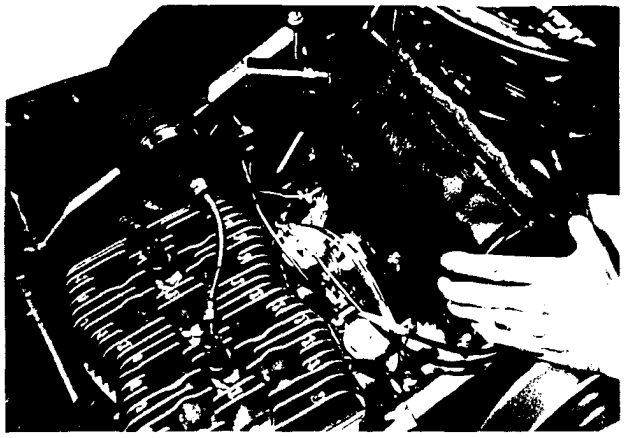
Fig. 4-4



A399

4. Remove air intake hose from silencer. Loosen clamps that hold silencer on carburetors; then remove silencer.

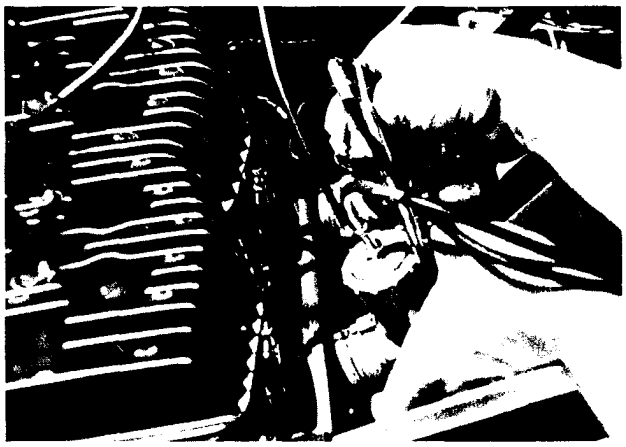
Fig. 4-5



A400

5. Loosen carburetor clamps and remove carburetors from flanges. Disconnect impulse line at this time; then disconnect wiring harness from engine.

Fig. 4-6



A401

6. Remove the three cap screws securing the recoil; then move recoil free of engine.

7. Remove the two cap screws securing the adjustable snubber to the front end.

8. Remove the four plastic plugs from the underside of belly pan.

9. Remove the two cap screws and two socket head cap screws securing engine to the motor plate.

10. Lift engine free of chassis.

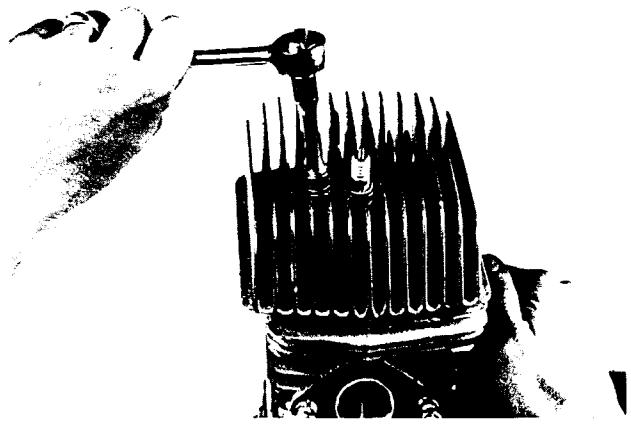
11. Remove the four nuts and lock washers securing the exhaust manifold to the engine.

Disassembly

AB25F1/F2

1. Remove the six nuts and washers securing the cylinder head to the cylinder.

Fig. 4-7

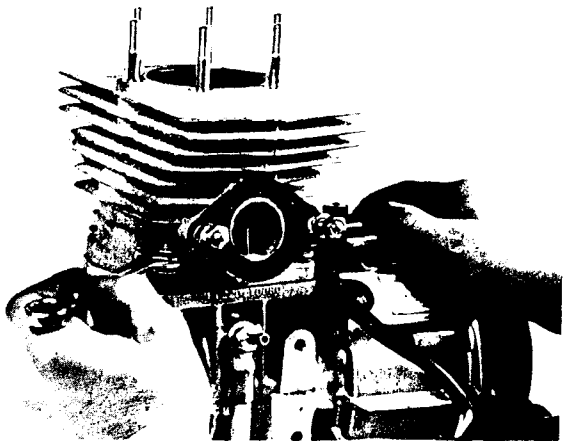


A420

2. Carefully lift the head free of cylinder; then remove the cylinder head gasket.

3. Remove the cylinder base nuts.

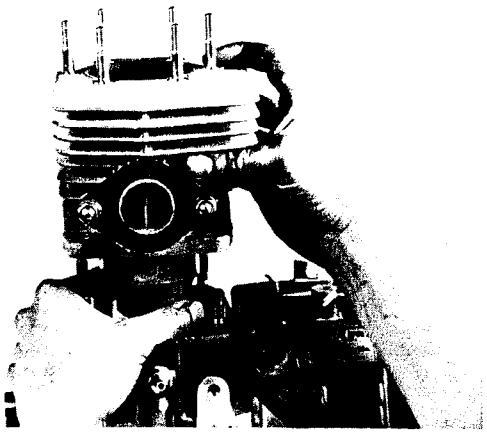
Fig. 4-8



A421

4. Carefully lift the cylinder straight up.

Fig. 4-9



A422

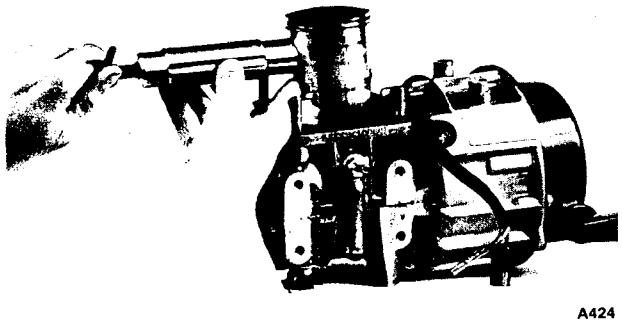
5. Remove the piston pin circlips.

Fig. 4-10

A423

6. Using the Arctic piston pin puller, remove the piston pin.

Fig. 4-11

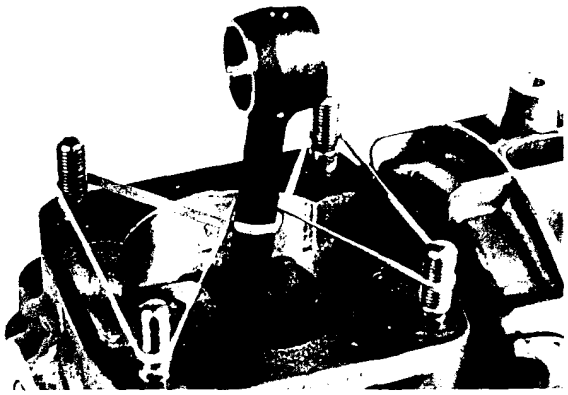


A424

7. Remove the connecting rod bearing and place it with the piston pin.

8. Install a rubber band over the connecting rod. This will prevent the rod from damaging the cylinder base surface should the crankshaft be rotated.

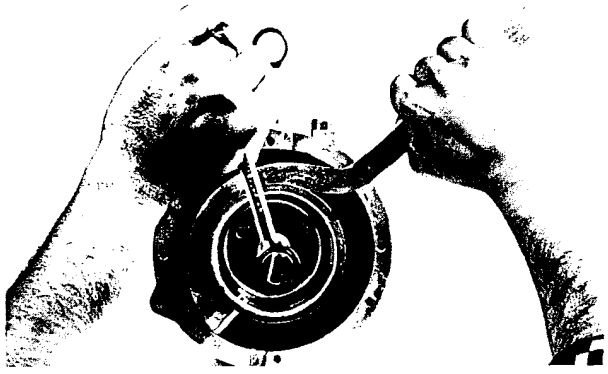
Fig. 4-12



A425

9. Remove the nut, lock washer and spacer washer securing the magneto on the crankshaft.

Fig. 4-13



A412

10. Using the Arctic flywheel puller (part no. 0144-112), remove the flywheel from the crankshaft by tightening the large puller bolt. If flywheel has not broken loose, give the puller bolt a sharp rap with a hammer. The shock should loosen the flywheel. If it doesn't, repeat procedure until the flywheel is free.

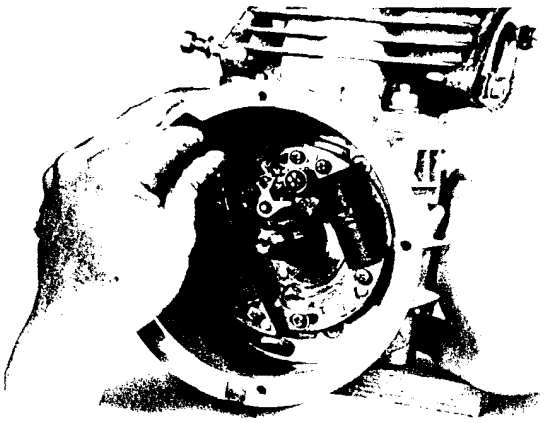
Fig. 4-14

A414

11. Place the flywheel on a clean work bench with the flywheel magnets facing upward.

12. Using a scribe, mark the magneto baseplate so it can be replaced in the same position for timing purposes. Remove the two screws holding the baseplate in position.

Fig. 4-15

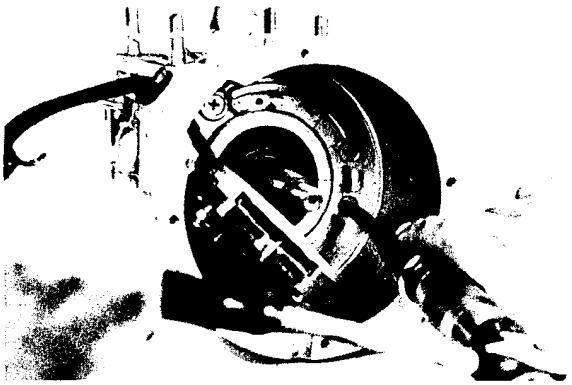


A415

13. Slide the baseplate off the crankcase and lay it in the magneto housing. DO NOT remove.

14. Remove the eight screws securing magneto case to the crankcase. Use an impact driver to loosen the screws.

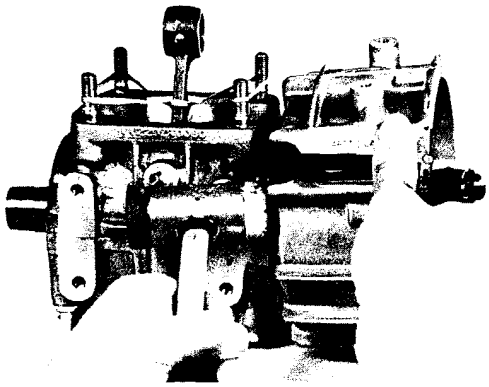
Fig. 4-16



A417

15. When all screws have been removed, tap the magneto case with a soft mallet to remove it from the crankcase.

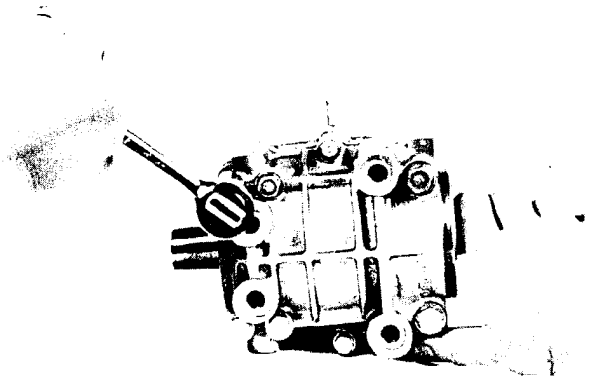
Fig. 4-17



A418

16. Lay the engine on its side. Remove the cap screws and washers securing crankcase halves together.

Fig. 4-18

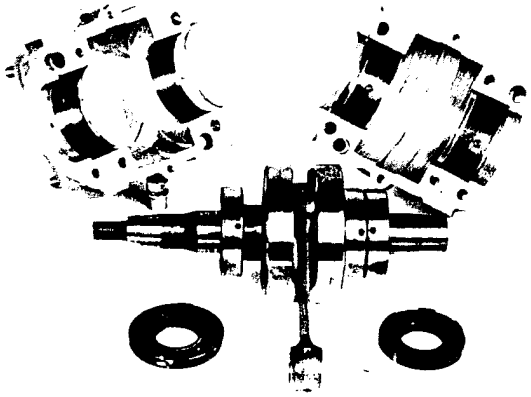


A428

17. Split the crankcase halves by tapping the sides with a soft mallet. DO NOT use a screwdriver or chisel to pry the cases apart. Any damage to the sealing surfaces may result in serious engine damage.

18. Separate the cases; then remove the crankshaft.

Fig. 4-19

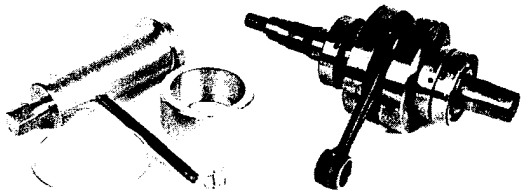


A430

19. Slide the crankcase seals off the ends of the crankshaft.

20. If the crankshaft bearings are to be removed, use the Arctic bearing puller kit with the appropriate shells and retaining ring (See: Crankshaft Repair, page 37).

Fig. 4-20



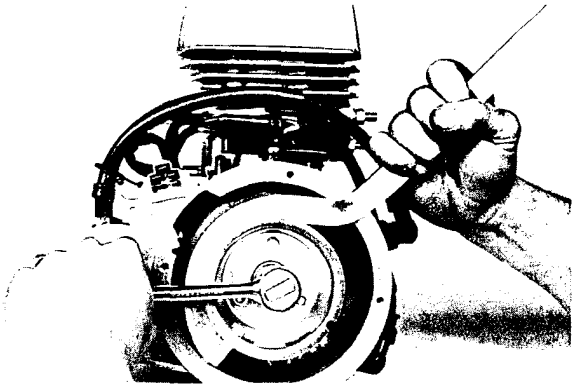
A436

21. If no further disassembly is required, proceed to Cleaning and Inspecting.

AA28F2/F3, AA34F3

1. Remove the nut, lock washer and spacer washer securing the flywheel on the crankshaft.

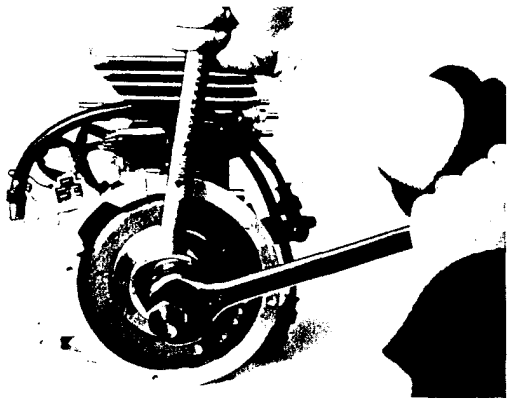
Fig. 4-21



A240

2. Using the Arctic flywheel puller (part nos. 0144-064 or 0144-112), remove the flywheel from the crankshaft by tightening the large puller bolt. If flywheel does not break loose, give the puller bolt a sharp rap with a hammer. The shock should free the flywheel. Repeat until the flywheel is free.

Fig. 4-22

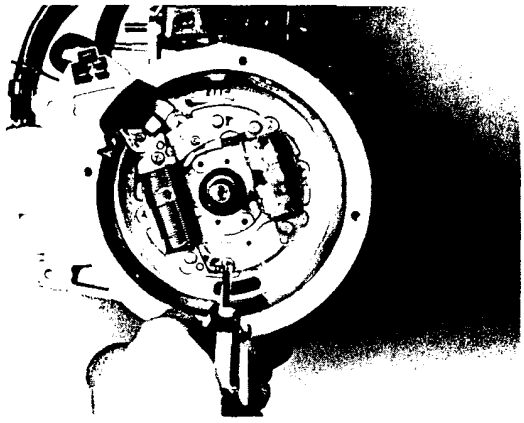


A016

3. Place the flywheel on a clean workbench with the flywheel magnets facing upward.

4. Using a scribe, mark the magneto baseplate so it can be replaced in the same position for timing purposes. Remove the two screws holding the baseplate in position.

Fig. 4-23



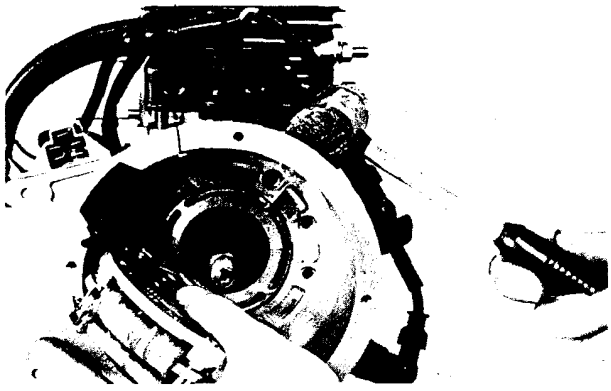
A017

5. Slide the baseplate off the crankshaft and lay it in the magneto housing. DO NOT remove.

6. Using an impact driver, loosen the eight screws securing the magneto case to the crankcase; then remove screws.

7. Using a soft mallet, tap the flywheel housing to remove it from the crankcase.

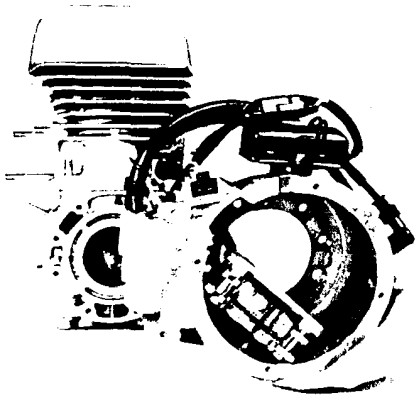
Fig. 4-24



A019

NOTE: The electrical system can be left intact and removed with the housing.

Fig. 4-25



A028

8. Remove the nuts and washers securing the intake manifold to the cylinders.

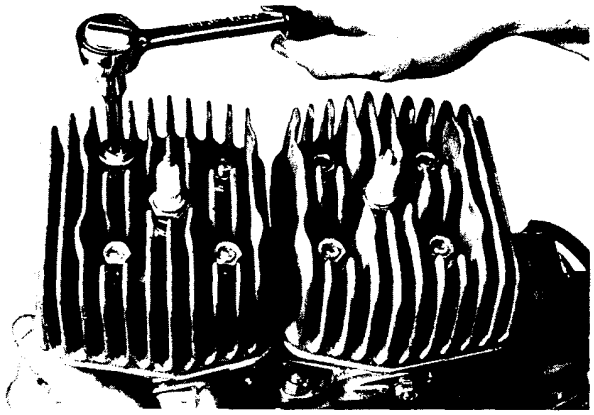
9. Remove the manifold from the cylinders; then remove the intake gaskets.

Fig. 4-26

A117

10. Remove the nuts and washers securing the cylinder heads in place.

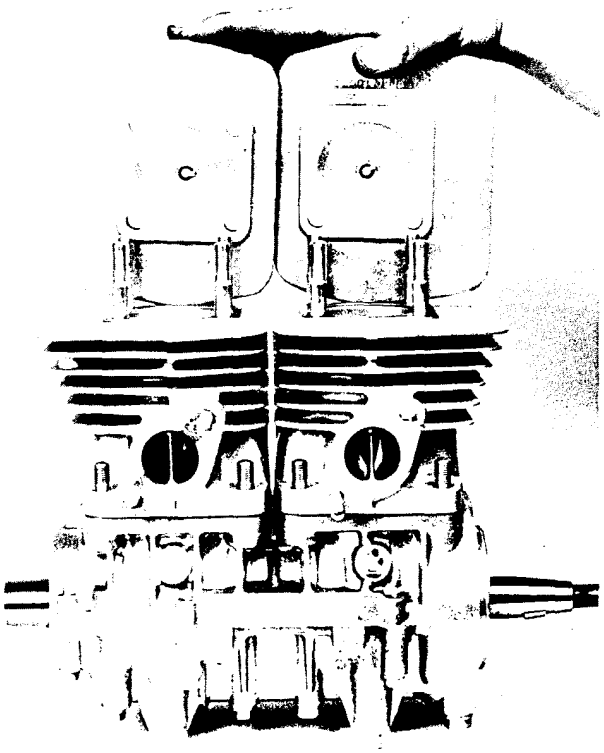
Fig. 4-27



A040

11. Remove the cylinder heads and cylinder head gaskets.

Fig. 4-28



A243

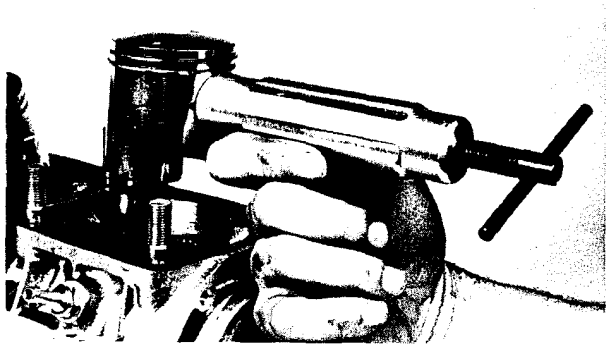
12. Remove the cylinder base nuts and washers.
13. Carefully lift the cylinders straight up.
14. Remove the piston pin circlips.

Fig. 4-29

A046

15. Using the Arctic piston pin puller, remove the piston pin.

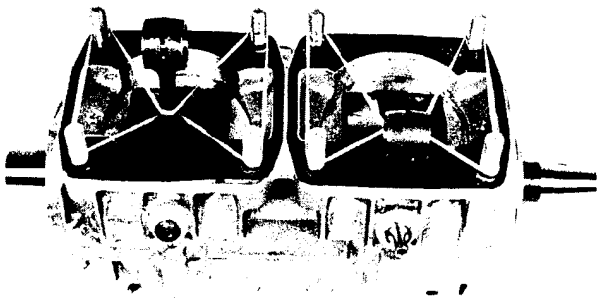
Fig. 4-30



A048

16. Install rubber bands over the connecting rods.

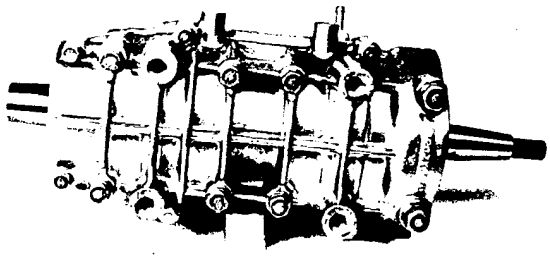
Fig. 4-31



A063

17. Lay the engine on its side. Remove the bolts and washers securing crankcase together.

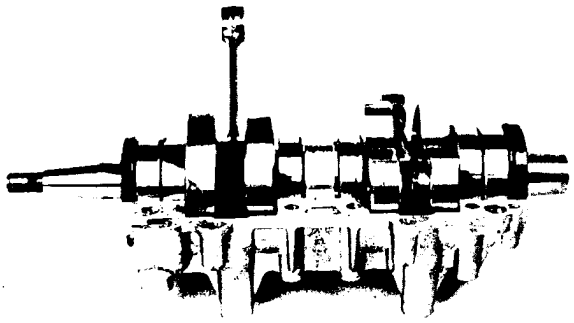
Fig. 4-32



A156

18. Split the crankcase halves by tapping the sides with a plastic hammer. DO NOT use a screwdriver or chisel to pry the cases apart. Any damage to the sealing surface may result in serious engine damage.
19. Lift the top half of the case off the bottom; then remove the crankshaft.

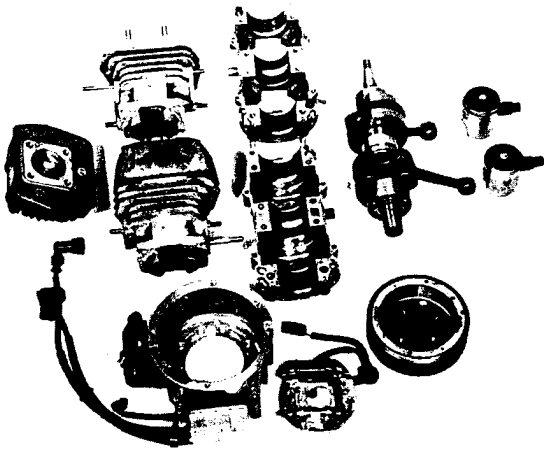
Fig. 4-33



A160

20. The major engine components are shown. If the crankshaft bearings are to be removed, use the Arctic bearing puller kit with the appropriate shells and retaining ring (See: Crankshaft Repair, page 37).

Fig. 4-34



A236

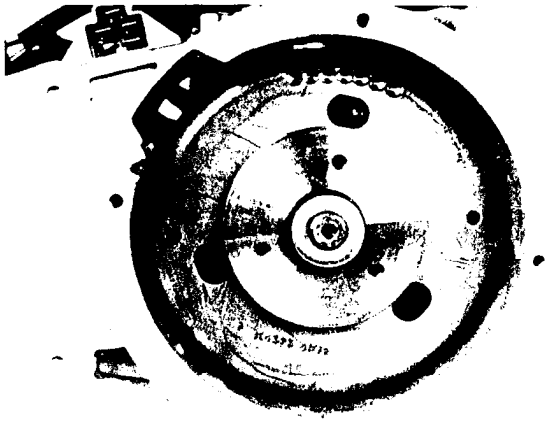
21. If no further disassembly is required, proceed to Cleaning and Inspecting.

AC50F2

1. Remove the nut, lock washer and spacer washer securing the flywheel on the crankshaft.

2. Using the Arctic flywheel puller (part nos. 0144-064 or 0144-112), remove the flywheel from the crankshaft by tightening the large puller bolt. If flywheel does not break loose, give the puller bolt a sharp rap with a hammer. The shock should free the flywheel. Repeat until flywheel is free.

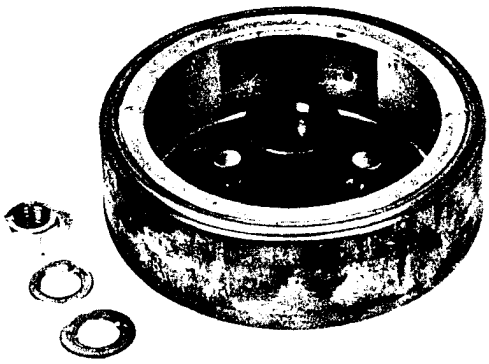
Fig. 4-35



A015

3. Place the flywheel on a clean workbench with the flywheel magnets facing upward.

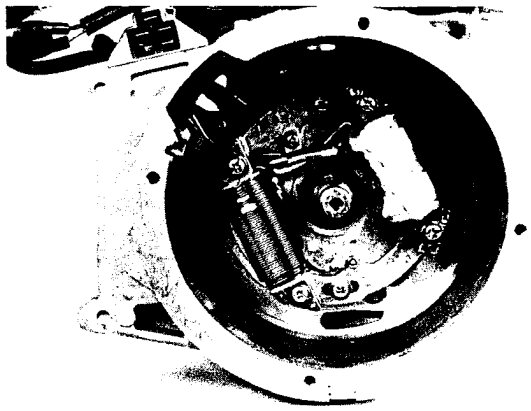
Fig. 4-36



A113

4. Using a scribe, mark the magneto baseplate so it can be replaced in the same position for timing purposes. Remove the two screws holding the baseplate in position.

Fig. 4-37

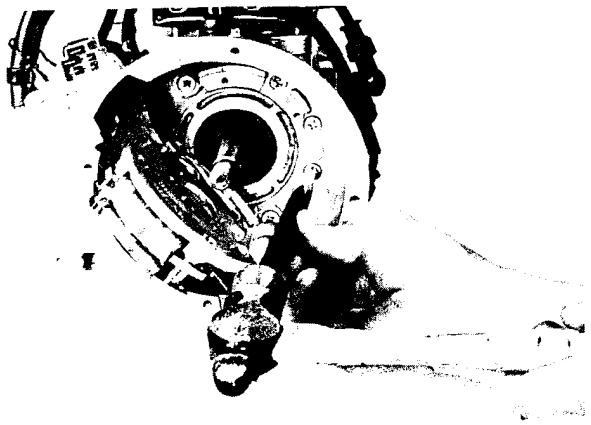


A104

5. Slide the baseplate off the crankshaft and lay it on the magneto housing. DO NOT REMOVE.

6. Remove the eight screws securing magneto case to crankcase, using an impact screwdriver.

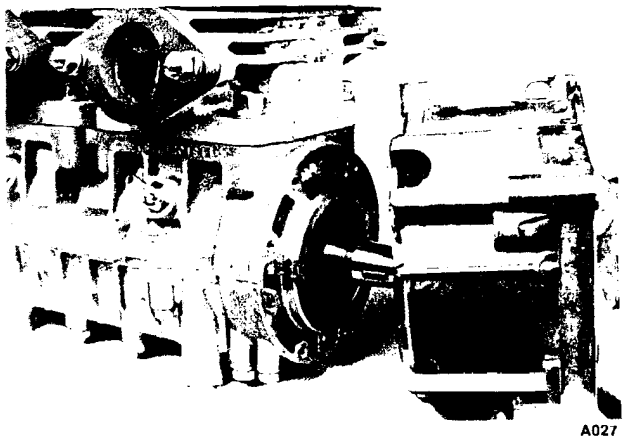
Fig. 4-38



A018

7. Using a soft mallet, tap the flywheel housing to remove it from the crankcase.

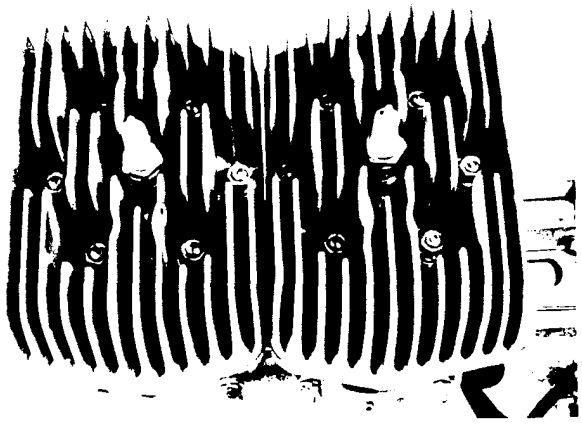
Fig. 4-39



A027

8. Remove the twelve nuts and washers securing cylinder heads.

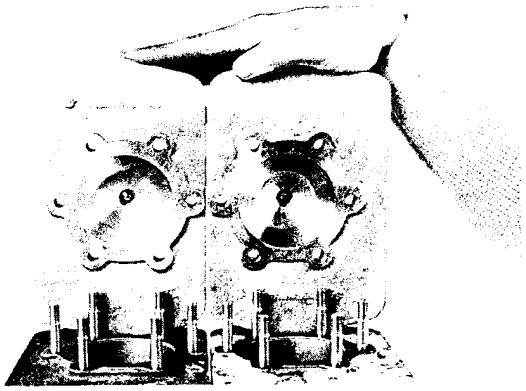
Fig. 4-40



A036

9. Remove the cylinder heads and head gaskets.

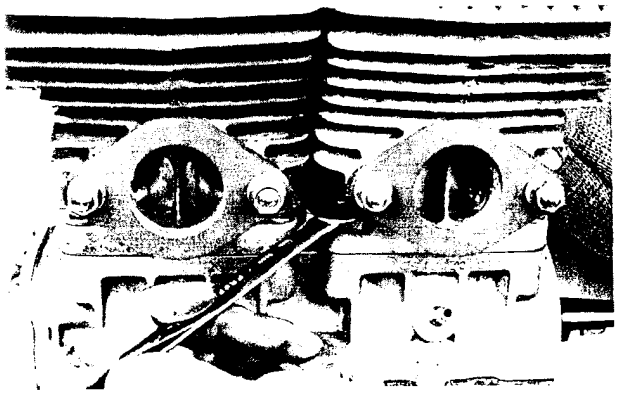
Fig. 4-41



A037

10. Remove the cylinder base nuts and carefully lift the cylinders straight up until free of piston.

Fig. 4-42



A098

11. Remove piston pin circlips.

Fig. 4-43

A047

12. Using the Arctic piston pin puller, remove the piston pin.

Fig. 4-44

A048

13. Remove the piston pin bearing and place it with the corresponding piston pin and piston. Keep the piston, pin and bearing as a set.

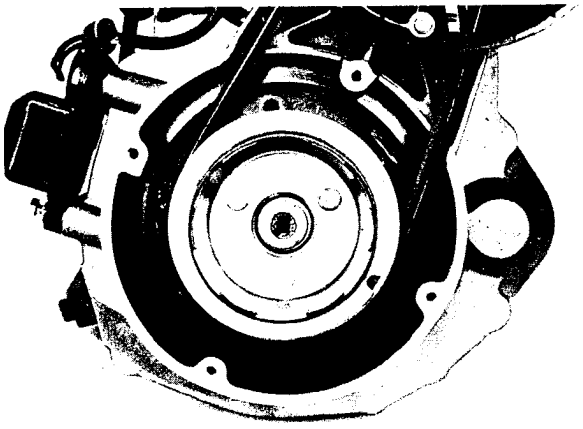
14. For further disassembly, the engine is basically the same as model AE50A2. To disassemble crankcase, proceed to AE50A2, AC50F2 Crankcase, page 36).

AC44A3, AB50A3, AE50A2

1. Remove the cap screws and washers securing the recoil.

2. Remove the three cap screws and lock washers securing starter pulley.

Fig. 4-45



A144

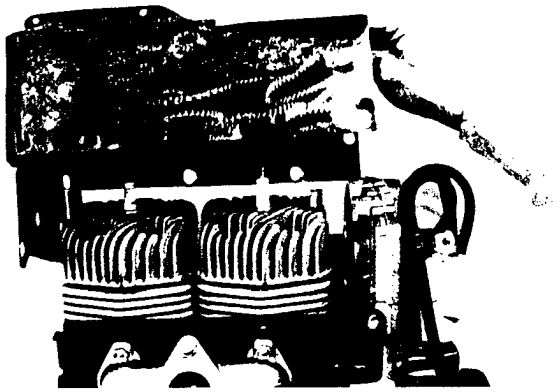
3. Remove the starter pulley and fan drive pulley from the flywheel.

Fig. 4-46

A132

4. Remove the bolts and washers securing the upper cowling; then lift off cowling.

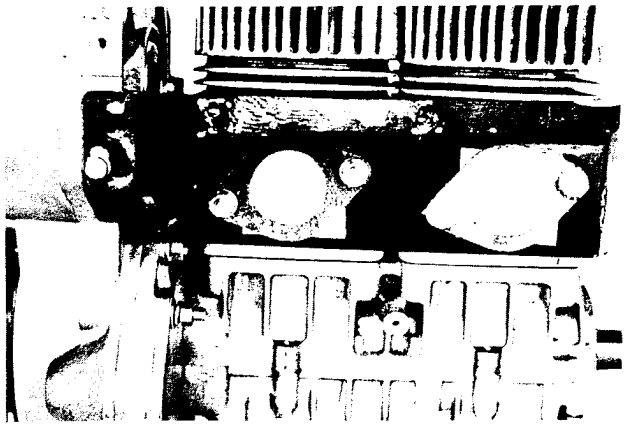
Fig. 4-47



A145

5. Remove the exhaust gaskets and front cowling.

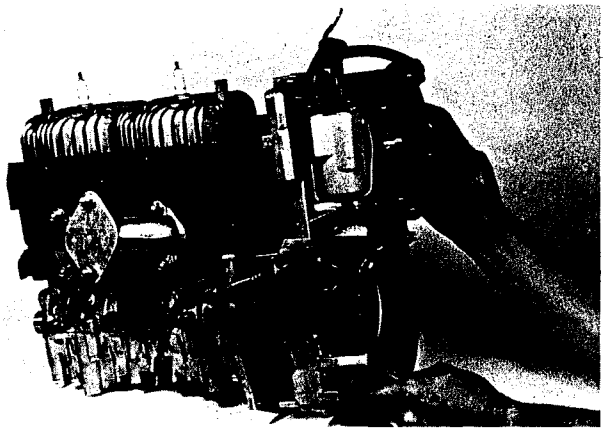
Fig. 4-48



A146

6. Remove the nuts and washers from the fan housing studs. Remove the fan housing assembly. For further disassembly of the fan housing, proceed to step 7. For further engine disassembly, proceed to step 13.

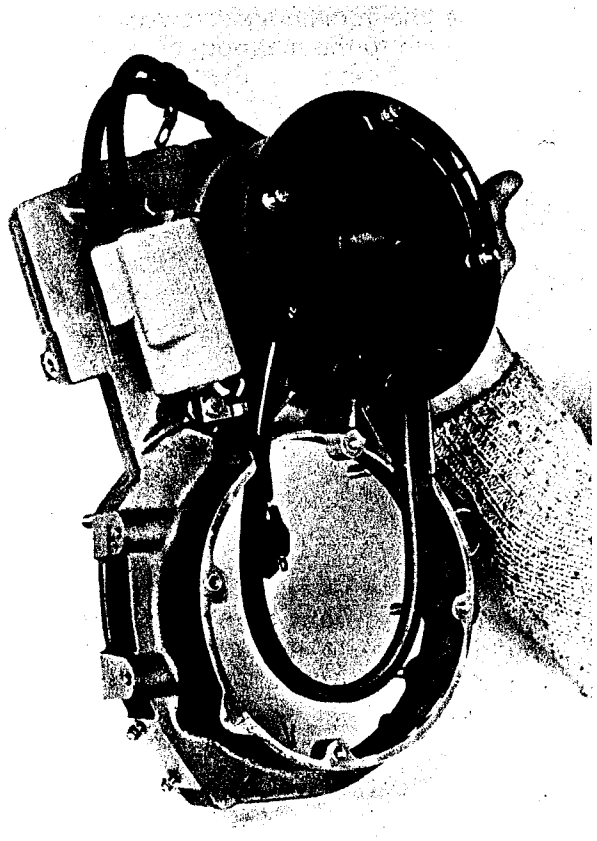
Fig. 4-49



A233

7. Remove the screws and washers securing the fan protector.

Fig. 4-50

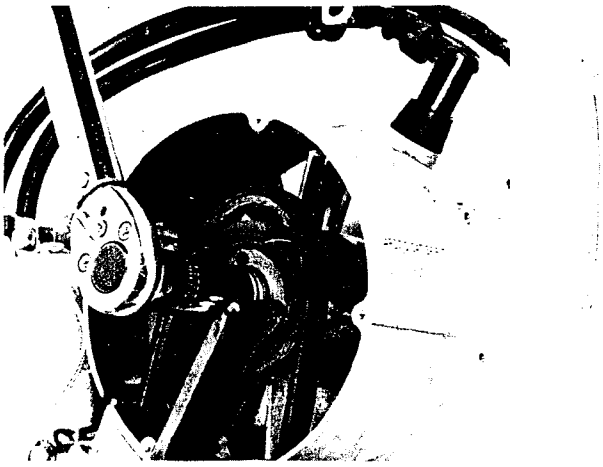


A133

8. Remove the nut and washers securing driven fan pulley. Use the pulley spanner wrench to prevent the fan from turning. DO NOT try to hold the fan by prying on the fan blades.

NOTE: A broken fan blade will cause engine vibration and will also accelerate fan bearing wear.

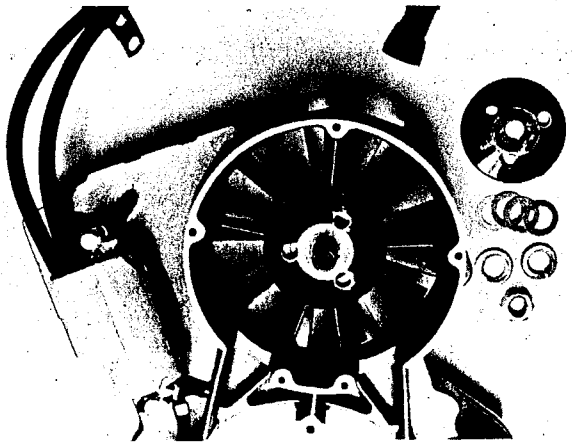
Fig. 4-51



A354

9. Remove the outer pulley, shims and finally, the inner pulley; then remove the spacer.

Fig. 4-52

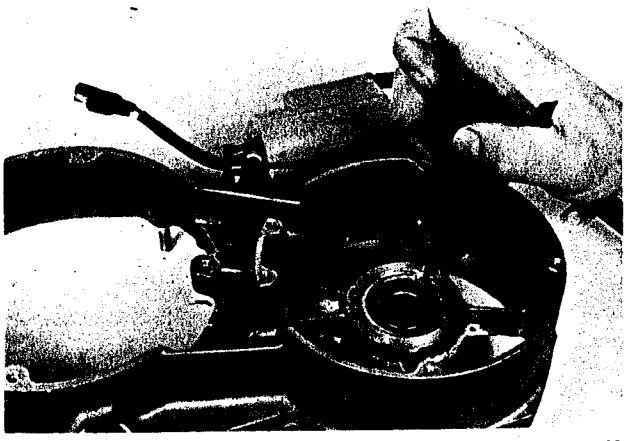


A136

10. Carefully tap the fan assembly out of the bearings and case.

11. Remove the large snap ring.

Fig. 4-53

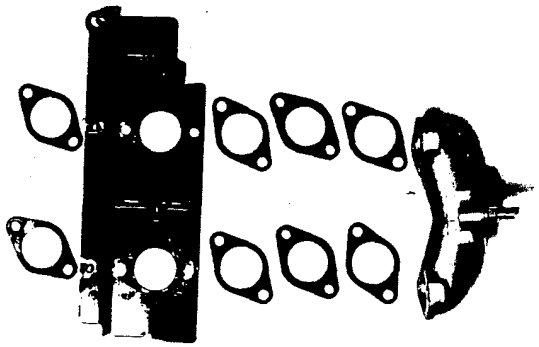


A138

12. Carefully drive the bearings out of the housing.

13. Remove the four nuts and washers securing intake manifold; then, in order, remove the manifold, gaskets, insulators, gaskets, cowling and gaskets.

Fig. 4-54



A121

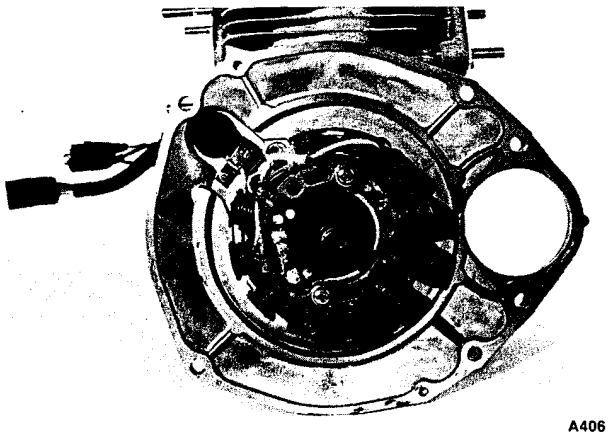
14. Remove the flywheel nut. To prevent engine from turning over, install the starter pulley with three recoil cap screws; then use flywheel spanner wrench (part no. 0144-007) to hold engine flywheel.

15. Tighten the puller bolt while holding flywheel with the spanner wrench. If flywheel does not break loose, tighten puller bolt; then sharply rap the large puller bolt with a hammer. The impact should free the flywheel. Repeat procedure until flywheel is free.

16. Remove puller. Place flywheel on a clean surface with magnets facing upward.

17. Remove the two screws securing the coil ring to the stator plate.

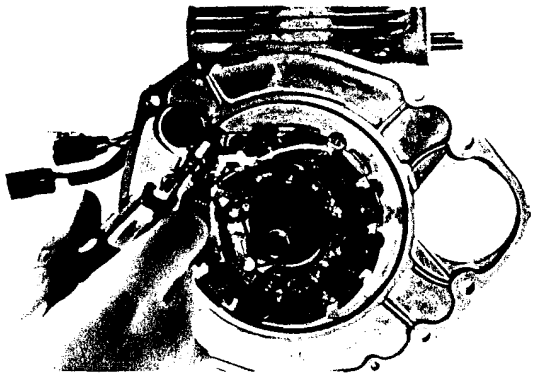
Fig. 4-55



A406

18. Loosen the wiring harness clamp.

Fig. 4-56

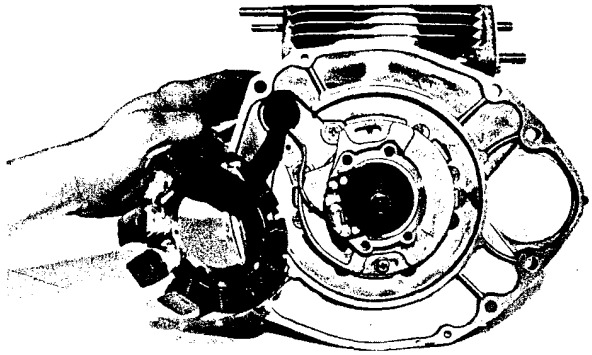


A408

19. Slide the coil ring free of the stator plate; then remove the top stator plate screw. Note the position of the timing marks in relation to the screw hole. The marks correspond left to right with 16, 18, 20 and 22 degrees before top dead center (BTDC). The stator must be correctly positioned during assembly.

20. Remove the remaining screw securing the stator plate to the magneto case; then slide plate free of case.

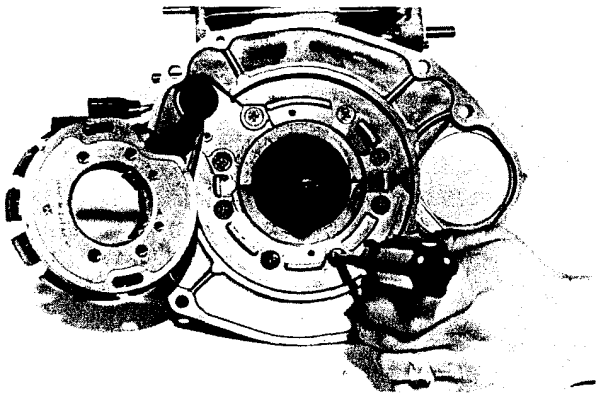
Fig. 4-57



A409

21. Remove the eight screws securing the magneto case to the crankcase, using an impact screwdriver.

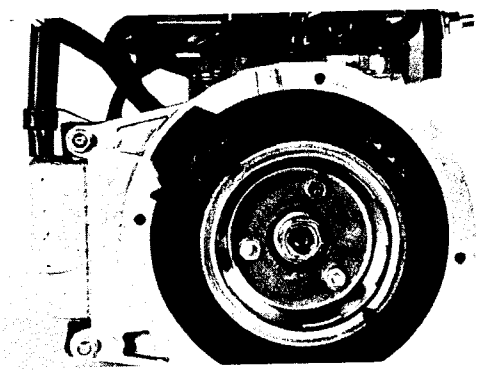
Fig. 4-58



A410

22. Using a rubber mallet, carefully tap the magneto housing until it is free of the crankcase.

Fig. 4-59

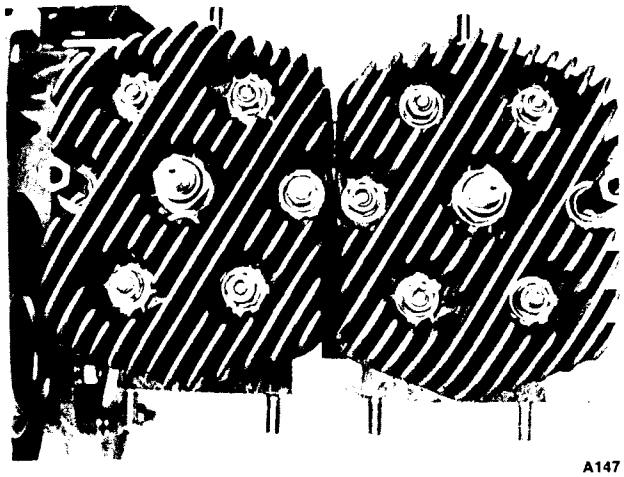


A411

23. Remove the twelve nuts and washers securing cylinder heads.

NOTE: The two long nuts are located on the most outward stud on both the MAG and PTO sides.

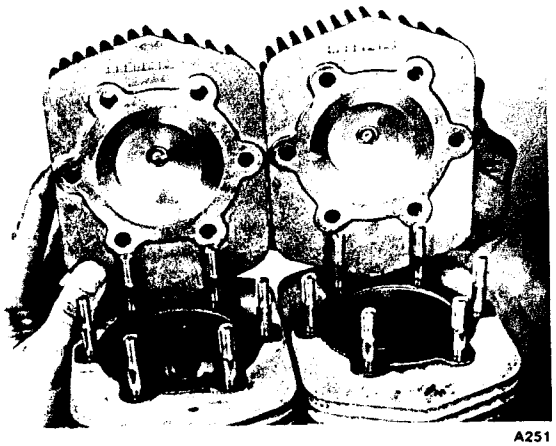
Fig. 4-60



A147

24. Remove the cylinder heads and head gaskets.

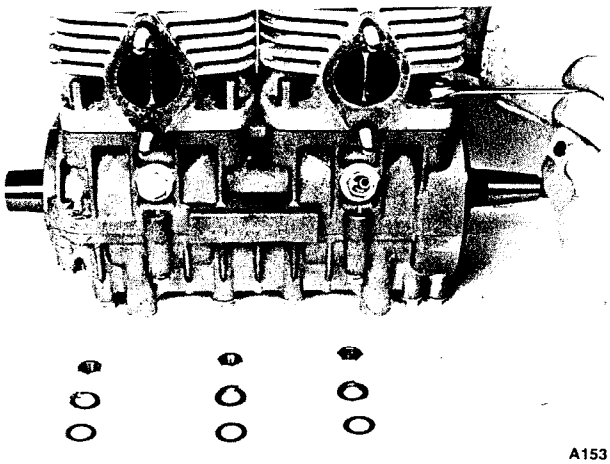
Fig. 4-61



A251

25. Remove the nuts and washers securing the cylinders. Be sure to keep parts with their respective cylinders.

Fig. 4-62



A153

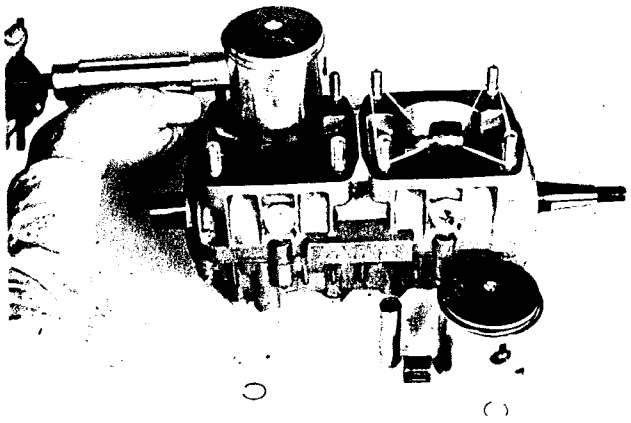
26. Remove the outside piston pin circlips.

Fig. 4-63

A047

27. Remove the piston pin using the Arctic piston pin puller (part no. 0144-003).

Fig. 4-64



A091

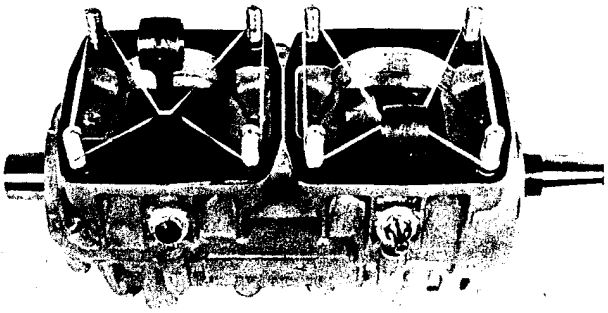
28. Remove the piston rings.

Fig. 4-65

A090

29. Place rubber bands over rods. This will prevent the rods from hitting and nicking cylinder base surfaces should the crankshaft be rotated.

Fig. 4-66



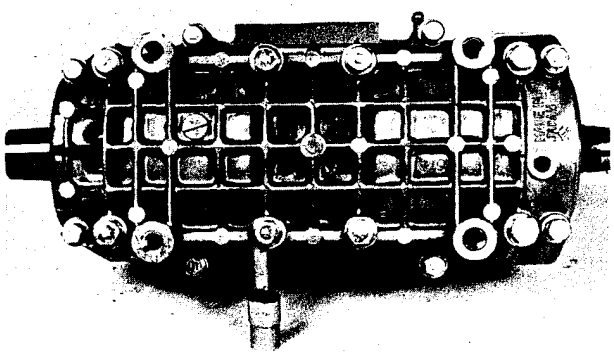
A063

30. To disassemble crankcase, proceed to either AC44A3, AB50A3 Crankcase or AC50F2, AE50A2 Crankcase.

AC44A3, AB50A3 Crankcase

1. Remove the sixteen cap screws and washers holding the crankcase halves together.

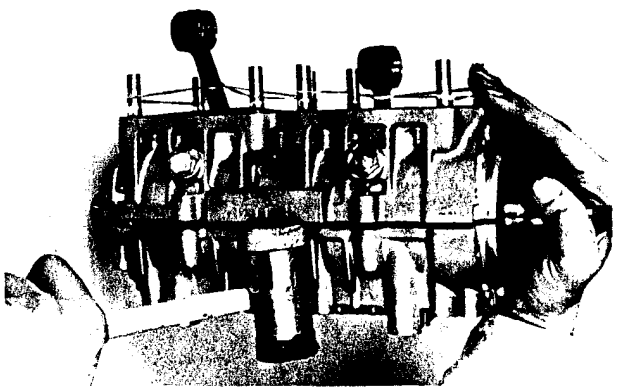
Fig. 4-67



A071

2. Carefully tap the crankcase halves apart. Be careful not to damage the sealing surfaces.

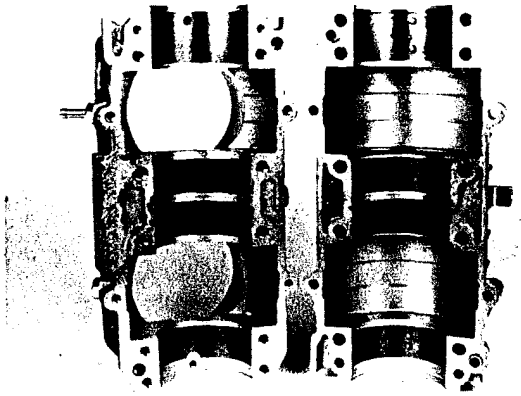
Fig. 4-68



A257

3. Lift the crankshaft out of the crankcase. Be sure to account for the C-ring and dowel pins in the lower half of the crankcase.

Fig. 4-69

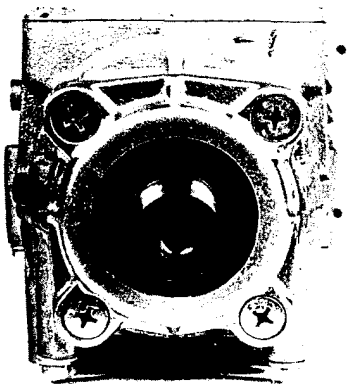


A072

4. Slide the crankshaft oil seals off the crankshaft. If bearings need to be replaced, use the Arctic bearing puller kit with the appropriate shells and retaining ring (See: Crankshaft Repair, page 37).

AC50F2, AE50A2 Crankcase

Fig. 4-70

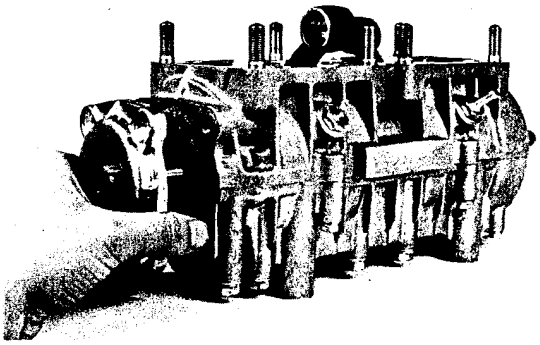


A093

1. Remove the four large phillips head cap screws from the PTO end crankshaft seal holder.

2. Slide the PTO side seal plate and gasket away from the crankcase.

Fig. 4-71



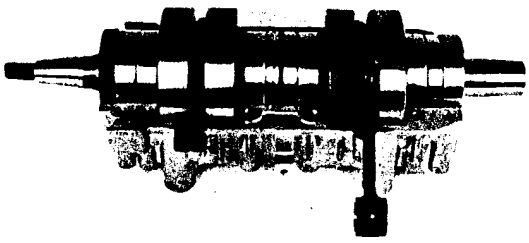
A092

3. Lay the engine on its side. Remove the sixteen cap screws and washers securing crankcase halves together (refer to Fig. 4-67).

4. Separate the crankcase halves by tapping the sides with a soft mallet. DO NOT use a screwdriver or chisel to pry the cases apart. Any damage to the sealing surface may result in serious engine damage.

5. Lift the top half of the case off the bottom; then remove the crankshaft.

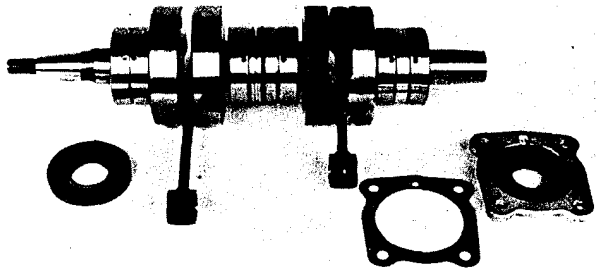
Fig. 4-72



A088

6. Slide the crankcase seal off the MAG end of the crankshaft. The Pantera series crankshaft and seals are shown.

Fig. 4-73



A087

7. If bearings need to be removed, use the Arctic bearing puller kit with the appropriate shells and retaining ring (See: Crankshaft Repair, below).

Crankshaft Repair

Rebuilding

The Spirit engine uses a crankshaft consisting of many replaceable components. Individual replacement parts are shown in the parts manuals and can be ordered as needed.

Because the crankshaft is one of the principal moving parts in the engine, the crankshaft must be handled carefully to ensure balance and trueness. Arctic recommends that replacement of any crankshaft parts be done only by professional servicemen in shops equipped with the proper tooling and equipment.

Any dealer wishing the necessary tooling for crankshaft repair can contact the Field Service Department at Arctic for a list of suppliers.

Remove Bearings

The Arctic bearing puller kit and additional shells may be used to remove crankshaft bearings from any of the Spirit snowmobile engines.

Bearing Removal Tools		
Item	Part No.	Usage
Bearing Puller Kit	0144-080	All Models
Bearing Puller Shells	0144-114	2000 and 3000 Series
Bearing Puller Shells	0144-115	4000 and 5000 Series

NOTE: The PTO and MAG side bearings are identical in size and appearance but are different in composition. Be sure to mark bearings to ensure correct installation. New bearings can be identified by box part number only.

1. To remove bearings from the MAG end of the crankshaft, use a medium bearing puller or a bearing splitter to separate the MAG bearings enough to allow use of the Arctic bearing puller.

NOTE: Be sure to place some type of support under the bearings when using a bearing splitter to prevent the crankshaft from being damaged.

2. Thread the flywheel nut onto the threaded portion of the crankshaft so it is flush with the end of the shaft. This will prevent damage to the threads.

3. Make a small drawing of the crankshaft and bearings making special note of dowel pin holes in bearings.

4. Slide puller over end of crankshaft. Place shells over bearings; then slide retaining ring over shells.

5. Tighten the puller bolt until the bearing releases from the crankshaft taper. Remove the remaining bearing using instructions in steps 1-5.

6. Separate the PTO side outer bearing using a bearing splitter.

NOTE: Be sure to place some type of support under the bearings when using a bearing splitter to prevent the crankshaft from being damaged.

7. Install the protective dowel into the threaded bore in the PTO end of the crankshaft.

8. Install the bearing puller and shells around the bearing; then slide the retaining ring over the shells.

9. Tighten the bearing puller bolt until the bearing releases from the crankshaft taper.

10. Remove the bearing spacer (AC50F2 and AE50A2 only) and the remaining PTO end bearing using the instructions in steps 6-9.

● CAUTION ●

Make note of any shims that were removed as to thickness and position. The shims must be replaced during assembly, otherwise, engine damage may result.

Cleaning and Inspecting

NOTE: Whenever a part is worn excessively, cracked, defective or damaged in any way, replacement is necessary.

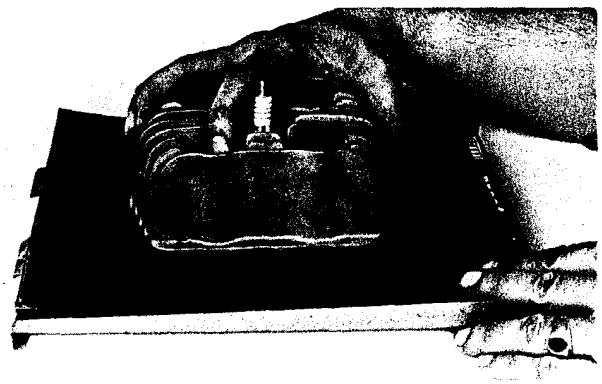
Cylinder Head

1. Remove any carbon buildup which has collected in the combustion chamber. Use a non-metallic tool to prevent scratching and scoring of the combustion chamber.

2. Thoroughly clean the cylinder head using cleaning solvent.

3. Place the cylinder head on a surface plate. Move the head in a large circular motion. Examine the sealing surface. The surface must seat evenly. Any "high" areas will be noted by a shiny finish on the sealing surface.

Fig. 4-74



A105

4. Correct an uneven surface with 200 grit emery paper and finish with 400 grit emery paper.

Cylinder

1. Remove carbon buildup from the exhaust port. Use a non-metallic tool to prevent scratching and scoring of the exhaust port.

2. Wash the cylinder in cleaning solvent.

3. Inspect cylinder for pitting, scoring, scuffing or corrosion. Replace if damaged.

Piston

1. Examine dome of piston for any area that may be "washed" free of carbon. A "washed" area may indicate worn rings or an out-of-round cylinder, however, a washed area near the transfer ports is common.

2. Remove carbon buildup from dome of piston; then clean piston ring grooves with a piece of an old ring.

NOTE: Because the Spirit engines use Keystone-type rings, conventional ring groove cleaners must not be used. Use a piece of an old ring to remove any carbon buildup in the ring grooves. An old ring may also be used to remove carbon buildup on the dome of the piston.

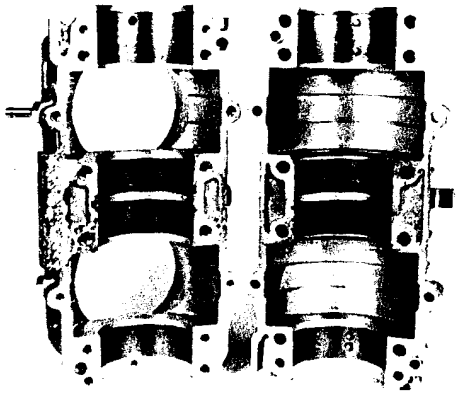
Crankcase Halves

1. Throughly wash halves using cleaning solvent.

2. Inspect halves for scoring, pitting, scuffing or any imperfections in the castings.

3. Check to ensure that the sealing surfaces are not nicked or damaged.

Fig. 4-75

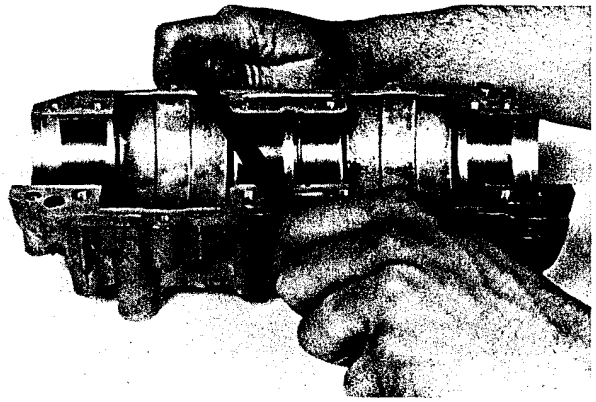


A072

4. Check the bearing areas for signs of cracking or bearing movement; also check retaining pins for wear.

5. If any nicks or scratches are found in the crankcase sealing area, they can be removed with a file as shown or else on a surface plate. If a file is used, practice the draw file method. This is done by pushing and pulling the file the complete length of the crankcase using very light pressure. Continue until the high spots have been removed. DO NOT file across the crankcase.

Fig. 4-76



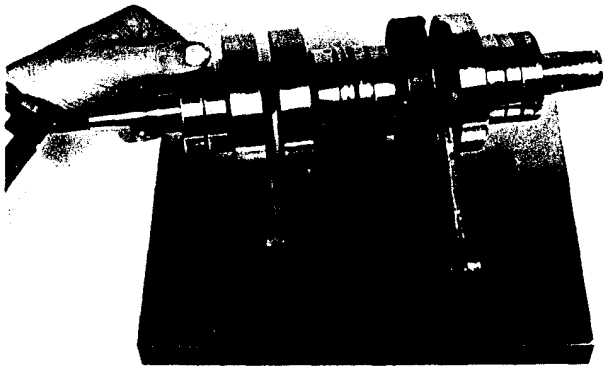
A183

Crankshaft

1. Thoroughly wash crankshaft and bearings using fresh cleaning solvent.

2. Inspect bearings for external wear, scoring, scuffing and free rotation. Turn the bearings by hand to ensure they turn freely without binding or roughness.

Fig. 4-77



A185

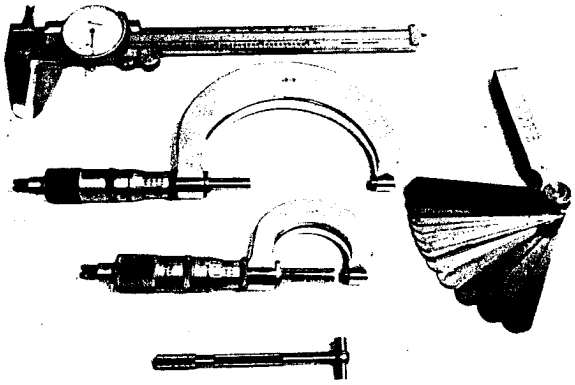
3. Check the connecting rod using the same method. If binding or roughness is noted, the connecting rod, bearing and crankpin will have to be replaced.

Measuring Critical Components

General

Special instruments are needed for measuring critical parts and tolerances. The tools shown must be kept in the shop area, must be kept clean at all times, and must be handled properly.

Fig. 4-78

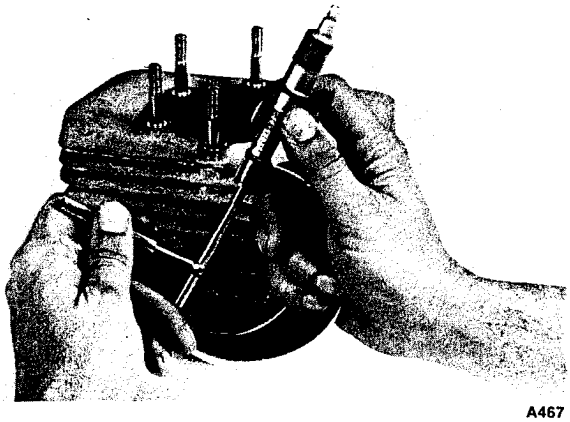


A184

Check Cylinder Wear

1. Insert an inside micrometer, cylinder gauge or snap gauge into the cylinder bore, approximately 3/8-inch below the top of the cylinder bore and take two measurements; the first, front to back; the second, side to side. If the measurements vary by more than 0.05 mm or 0.002 of-an-inch, or if the piston skirt/cylinder clearance is not within the acceptable tolerance range, the cylinder must be replaced. (See chart on page 41).

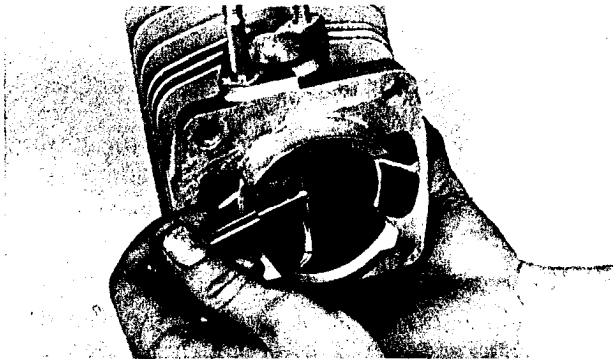
Fig. 4-79



A467

2. Take two measurements just below the intake port (front to back, side to side). If the measurements vary more than 0.05 mm or 0.002 of-an-inch, or if the piston skirt/cylinder clearance is not within the acceptable tolerance range, the cylinder must be replaced. (See chart on page 41).

Fig. 4-80



A100

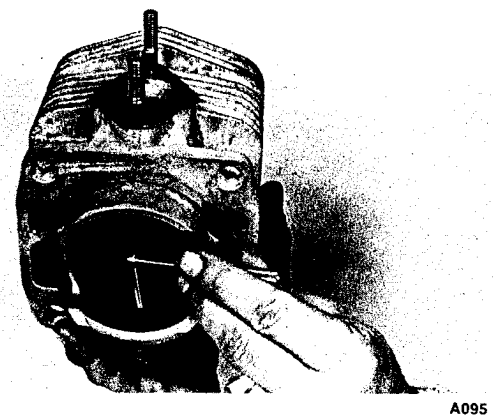
NOTE: If the measurements of step 1 and step 2 vary by more than 0.05 mm or 0.002 of-an-inch, the cylinder must be replaced.

NEW CYLINDER DIAMETERS		
Engine	**Diameter (mm)**	**Diameter (in.)**
AB25F1/F2	70.00-70.015	2.7559-2.7565
AA28F2/F3	54.015-54.030	2.126-2.127
AA34F3	60.000-60.015	2.362-2.363
AC44A3	65.000-65.015	2.559-2.560
AB50A3	70.000-70.015	2.7559-2.7565
AC50F2	70.000-70.015	2.7559-2.7565
AE50A2	70.000-70.015	2.7559-2.7565

Check Piston Skirt Clearance

1. Insert an inside micrometer approximately one inch into the bottom of the cylinder bore. Take the measurement from front to back.

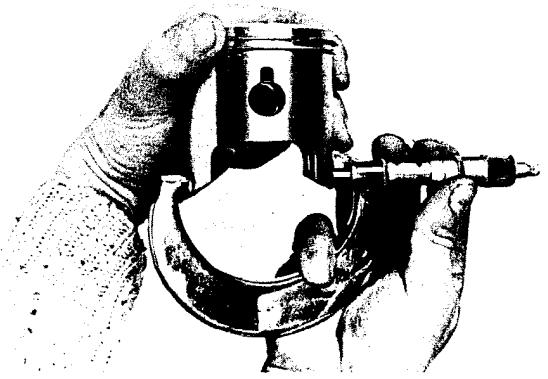
Fig. 4-81



A095

2. Measure the piston 1/4-inch above the bottom of the piston skirt from front to back.

Fig. 4-82



A049

3. Subtract the piston skirt measurement (step 2) from the cylinder bore measurement (step 1). The difference must fall between the values listed in the chart. If the difference exceeds the values listed, the problem must be corrected before the engine is assembled.

NOTE: If the cylinder bore is within tolerance, but the clearance exceeds the maximum value for the engine, the piston must be replaced. When replacing a piston, a new piston pin and needle bearing must also be installed.

Acceptable Piston Skirt/Cylinder Clearance			Wear Limit Clearance	
Engine	(mm)	(in.)	(mm)	(in.)
AB25F1/F2	0.05-0.06	0.0020-0.0025	Up to 0.15	Up to 0.006
AA28F2/F3	0.04-0.06	0.0015-0.0025	Up to 0.15	Up to 0.006
AA34F3	0.04-0.06	0.0015-0.0020	Up to 0.15	Up to 0.006
AC44A3	0.05-0.06	0.0020-0.0025	Up to 0.15	Up to 0.006
AB50A3	0.05-0.06	0.0020-0.0020	Up to 0.15	Up to 0.006
AC50F2	0.05-0.06	0.0020-0.0025	Up to 0.15	Up to 0.006
AE50A2	0.05-0.06	0.0020-0.0025	Up to 0.15	Up to 0.006

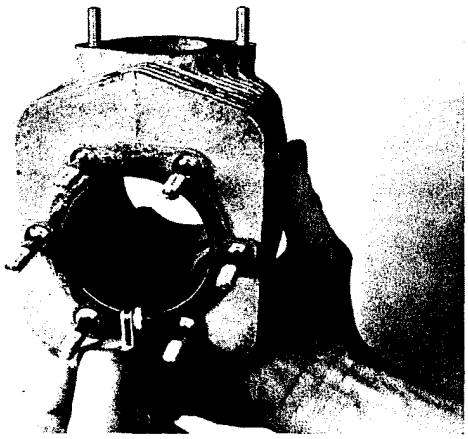
Check Piston Ring End Gap

1. Remove carbon buildup from the piston rings.

2. Insert the piston ring approximately 3/8-inch into the top of the cylinder bore. Position the ring horizontally in cylinder by pressing the dome of the piston against the ring.

3. Slide a feeler gauge between the ends of the ring. Piston ring end gap is listed below for either all new components or for acceptable wear limits.

Fig. 4-83



A057

4. Since the amount of wear at the ends and center of the piston ring arc affects the end gap, replace the ring set if the ring gap is excessive. If new rings are installed, cylinders should be deglazed with a cylinder hone. Use 500 or 600 grit stones on a hone with honing oil for lubrication.

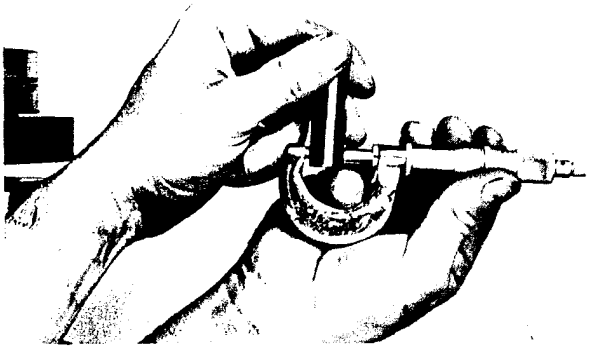
ACCEPTABLE RING END GAP CLEARANCES		
New Components		
Engine	Clearance (mm)	Clearance (in.)
AB25F1/F2	0.20-0.40	0.008-0.016
AA28F2/F3	0.15-0.36	0.006-0.014
AA34F3	0.15-0.36	0.006-0.014
AC44A3	0.15-0.36	0.006-0.014
AB50A3	0.20-0.40	0.008-0.016
AC50F2	0.20-0.40	0.006-0.014
AE50A2	0.15-0.36	0.006-0.014
Wear Limit		
AB25F1/F2	0.20-0.83	0.008-0.033
AA28F2/F3	0.15-0.80	0.006-0.031
AA34F3	0.15-0.80	0.006-0.031
AC44A3	0.15-0.80	0.006-0.031
AB50A3	0.20-0.83	0.008-0.033
AC50F2	0.20-0.83	0.008-0.033
AE50A2	0.20-0.83	0.008-0.033

Check Piston Pin Diameter

1. Clean the piston pin of any lubricant or coating.

2. Measure the piston pin approximately 1/4-inch from both ends. Piston pin specifications must be within the accepted values. If piston pin is not within specifications, replace piston pin and bearing as a set.

Fig. 4-84



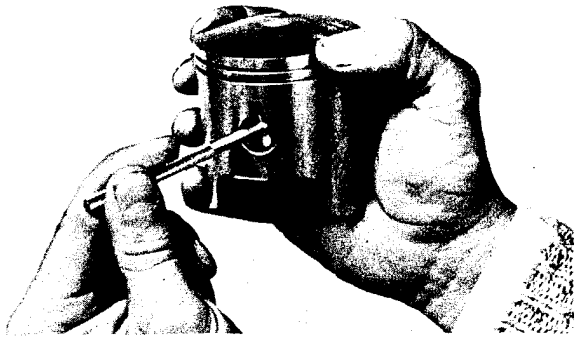
A050

ACCEPTABLE PISTON PIN DIAMETERS		
Engine	Diameter (mm)	Diameter (in.)
AB25F1/F2	18	0.7085-0.7087
AA28F2/F3	16	0.6297-0.6299
AA34F3	16	0.6297-0.6299
AC44A3	18	0.7085-0.7087
AB50A3	18	0.7085-0.7087
AC50F2	18	0.7085-0.7087
AE50A2	18	0.7085-0.7087

Check Piston Pin Bore Diameter

1. Insert an inside snap gauge about 1/4-inch from the outside of the piston pin bore.

Fig. 4-85



A051

2. Remove the snap gauge and measure it with an outside micrometer. If piston pin bore is not within specifications, replace the piston, piston pin and bearing.

ACCEPTABLE PIN BORE DIAMETERS		
Engine	Diameter (mm)	Diameter (in.)
AB25F1/F2	18	0.7085-0.7089
AA28F2/F3	16	0.6298-0.6301
AA34F3	16	0.6298-0.6301
AC44A3	18	0.7085-0.7089
AB50A3	18	0.7085-0.7089
AC50F2	18	0.7085-0.7089
AC50A2	18	0.7085-0.7089

Check Connecting Rod Small End Diameter

1. Insert a snap gauge into the bore of the connecting rod small end approximately 1/4 to 1/2-inch. Lock the gauge and carefully remove it.

Fig. 4-86

A064

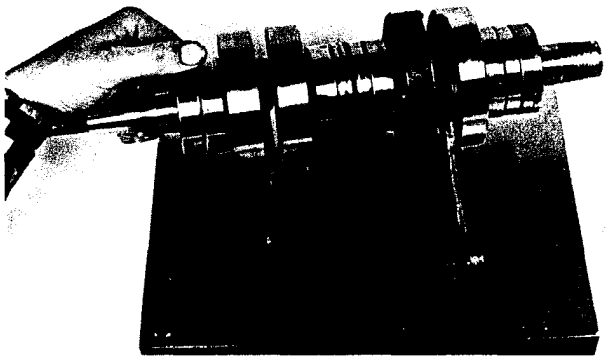
2. Measure the snap gauge using an outside micrometer. The diameter must be within the acceptable diameters. If the diameter is not within specifications, the connecting rod must be replaced.

ACCEPTABLE SMALL END DIAMETERS		
Engine	Diameter (mm)	Diameter (in.)
AB25F1/F2	23.00-23.03	0.9059-0.9067
AA28F2/F3	21.00-21.01	0.8268-0.8273
AA34F3	21.00-21.01	0.8268-0.8273
AC44A3	23.00-23.03	0.9059-0.9067
AB50A3	23.00-23.03	0.9059-0.9067
AC50F2	23.00-23.03	0.9059-0.9067
AE50A2	23.00-23.03	0.9059-0.9067

Check Crankshaft Runout

1. Firmly mount the crankshaft in a truing jig or on a set up as shown, using a surface plate, V-blocks and a dial indicator with a mounting base.

Fig. 4-87

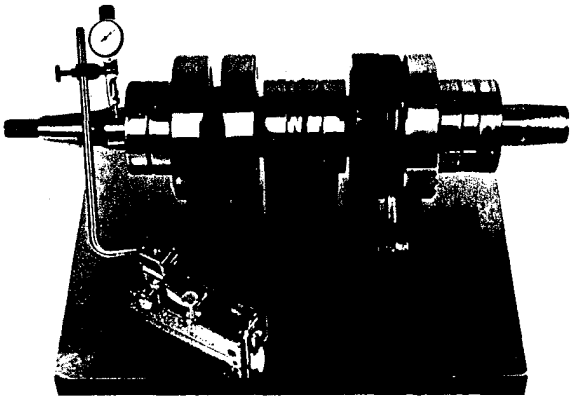


A185

2. Support the crankshaft with the OUTER crankshaft bearings on the V-blocks.

3. Mount the dial indicator against the crankshaft at the area of the oil seals. Be sure the crankshaft is clean. DO NOT take readings on the tapered areas of the crankshaft because an inaccurate reading will be obtained.

Fig. 4-88



A186

4. Slowly rotate the crankshaft and observe the "total" crankshaft runout. This is the difference between the highest and lowest obtained readings. Maximum runout must not exceed 0.05 mm or 0.002 of-an-inch. This specification applies to all Spirit engines. If the runout exceeds this, crankshaft must be straightened.

5. Check the remaining end of the crankshaft.

Check Connecting Rod Big End Radial Play

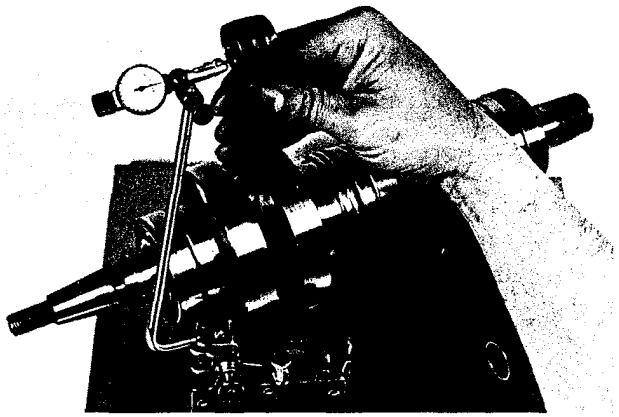
1. Use the same equipment as Check Crankshaft Runout.

2. Place the connecting rod at top dead center (TDC).

3. With the crankshaft held at TDC, lift the connecting rods straight up and observe the reading.

4. Push the connecting rod straight down and observe the reading.

Fig. 4-89



A187

5. For all models, crankshaft radial play must be from 0.02 - 0.03 mm or 0.0008 - 0.0012 of-an-inch. If radial play exceeds the maximum limit, the connecting rod, lower rod bearing and crankshaft pin must be replaced.

Check Crankshaft End Play

The Spirit engine uses a combination of a C-ring and dowel pins for locating the crankshaft in the crankcase. The dowel pins are used to prevent the bearing from turning. The bearing dowel pin holes have sufficient clearance to allow easy crankshaft replacement with the need for shimming nearly eliminated. The C-ring determines the crankshaft placement in the crankcase. During repair or replacement of the crankshaft, install the standard shim and bearing and check the end play.

1. Place the crankshaft in the lower crankcase half.

2. Rotate the bearings until correctly positioned over the crankcase dowel pins.

3. Mount a dial indicator against either end of the crankshaft.

4. Carefully push the crankshaft towards the PTO end; then toward the MAG end. Observe the "total" end play.

5. Crankshaft end play must be 0.05 - 0.10 mm or 0.002 - 0.004 of-an-inch. If end play is excessive, shim the bearings for the correct end play.

Assembly

Install Crankshaft Bearings - All Models

NOTE: On all 4000 and 5000 series engines the PTO and MAG side bearings are identical in size. In replacement, however, be sure to install the correct bearing on the appropriate side. The physical appearance of the bearings is identical, but the make-up is different. They are distinguishable by box part number only.

1. Place the crankshaft in a vise, make sure the MAG end is pointing upward. Wrap a rag around the crankshaft to guard against possible damage from the vise jaws.
2. Using hot oil, heat the inner race of the new bearing (this will cause the center race to expand allowing the bearing to be slid onto the shaft).
3. Refer to the drawing of bearing and shim position made during assembly. Slide any shims onto the shaft if they were removed.
4. Making note of dowel pin hole in bearing, grasp the heated bearing with a pliers. Slide bearing onto the MAG end until it seats against the MAG side flyweight.
5. Install any necessary shims and install the remaining bearing (twin cylinder models only) using the same procedure.

NOTE: Be sure to install any shims that were removed during disassembly.

6. Install the crankshaft in a vise, PTO end upward. Use a rag to protect crankshaft from vise jaws.
7. Install any shims or washers that were removed during disassembly.
8. Making note of dowel pin position, install the PTO end bearings using instructions in steps 2-4.
9. On Pantera models, install the bearing spacer.
10. Install the remaining bearing on the PTO end of the crankshaft.
11. The crankshaft is now ready for engine assembly.

AC50F2, AE50A2 Crankcase

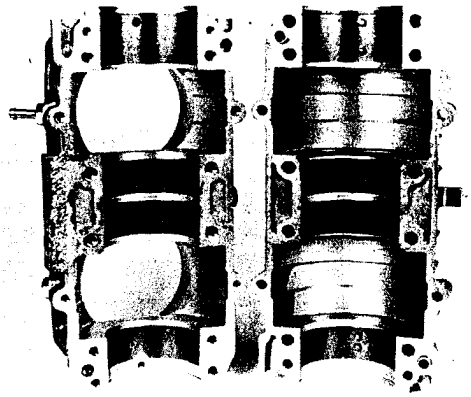
1. Lubricate the crankshaft seals by applying a liberal amount of grease between double lip of the seal; then slide MAG seal onto crankshaft with the spring side toward bearings.

Fig. 4-90

A239

2. Lubricate lower connecting rod bearings and main bearings with oil.

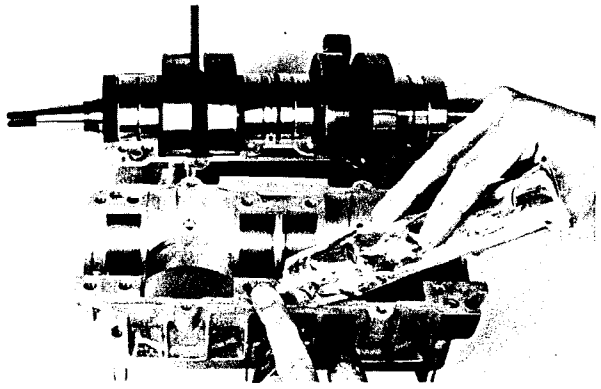
Fig. 4-91



A073

3. Apply a thin coat of crankcase sealer to both halves of the crankcase. Use a sealer that remains pliable when dry (such as Liquid Gasket, RTV Sealer, Silicone Sealer, etc.).

Fig. 4-92



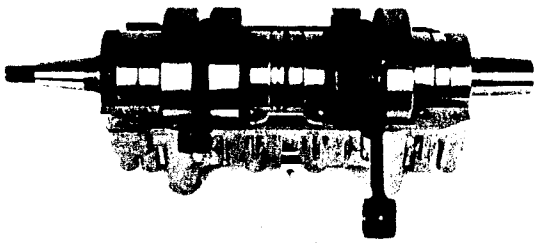
A074

4. Using a piece of #50 cotton thread, lay the thread just to the inside of the crankcase bolts. This will serve as an additional seal.

NOTE: Use cotton thread only. Polyester thread will not mushroom, resulting in an indentation of the crankcase halves.

5. Install crankshaft in bottom half of crankcase. Be sure the alignment hole in each bearing is positioned over the dowel pin in the crankcase. If the bearings are not properly seated, the case halves will not bolt together tightly. Be sure the C-ring is installed in the center of the crankshaft.

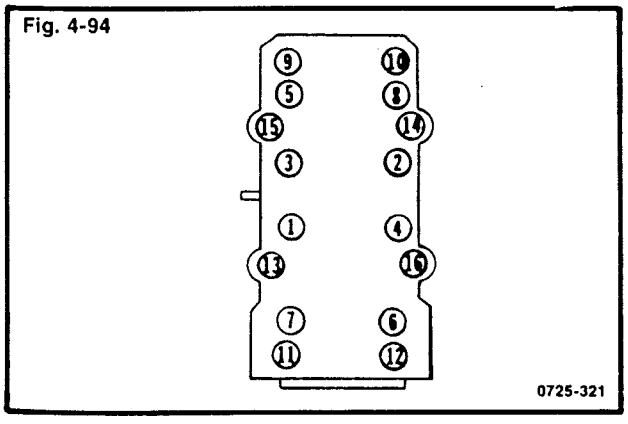
Fig. 4-93



A088

6. Install the top half of the crankcase. Install the various bolts finger tight only.

Fig. 4-94



0725-321

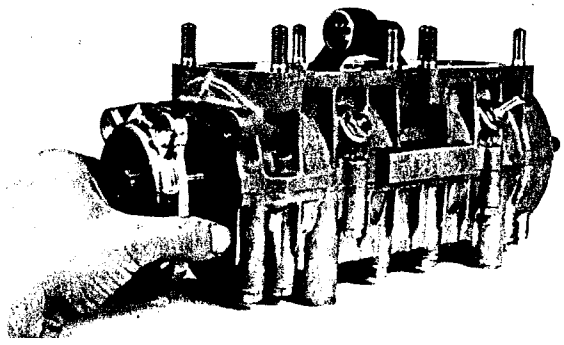
7. Tighten the bolts to the required torque value in increments of 0.5 kg-m or 4 ft-lb, using the sequence in Fig. 4-94.

CRANKCASE BOLT TORQUE		
Bolt Size	**kg-m**	**ft-lb**
6 mm	0.8 - 0.9	6 - 7
8 mm	1.8 - 2.2	13 - 16
10 mm	2.0 - 3.0	15 - 22

8. Tip the engine upright.

9. Place a light coat of RTV sealer on the PTO gasket surface of the crankcase. Install the gasket making sure oiling hole of gasket aligns with crankcase hole. Install the seal end plate.

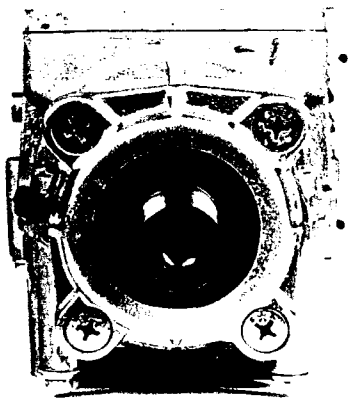
Fig. 4-95



A092

10. Place a small amount of Loc-Tite on the four phillips screws that secure end plate in position. Install the four screws and tighten with an impact driver.

Fig. 4-96



A093

AC44A3, AB50A3 Crankcase

1. Lubricate the crankshaft seals by applying a liberal amount of grease between double lip of the seal; then slide seals onto crankshaft with the spring side toward bearings.

2. Lubricate lower connecting rod bearings and main bearings with oil.

3. Apply a thin coat of crankcase sealer to both halves of the crankcase. Use a sealer that remains pliable when dry (such as Liquid Gasket, RTV Sealer, Silicone Sealer, etc.).

4. Using a piece of #50 cotton thread, lay the thread on the lower crankcase half just to the inside of the crankcase bolts. This will serve as an additional seal.

NOTE: Use cotton thread only. Polyester thread will not mushroom, but rather results in an indentation of the crankcase halves.

5. Install crankshaft in bottom half of crankcase. Be sure the alignment hole in each bearing is positioned over the dowel pin in the crankcase. If the bearings are not properly seated, the case halves will not bolt together tightly. Be sure the C-ring is installed in the center of the crankshaft.

6. Install the top half of the crankcase. Install the various bolts finger tight.

7. Tighten the bolts to the required torque value in increments of 0.5 kg-m or 4 ft-lb, using the values listed and torque sequence shown under AC50F2, AE50A2 Crankcase.

AC44A3, AB50A3, AE50A2

1. Apply a thin coat of RTV sealer to both sides of the base gaskets; then install base gaskets.

2. Install the pistons with the arrows on top of pistons pointing toward the exhaust side. Apply oil to the piston pins and install.

Fig. 4-97

A053

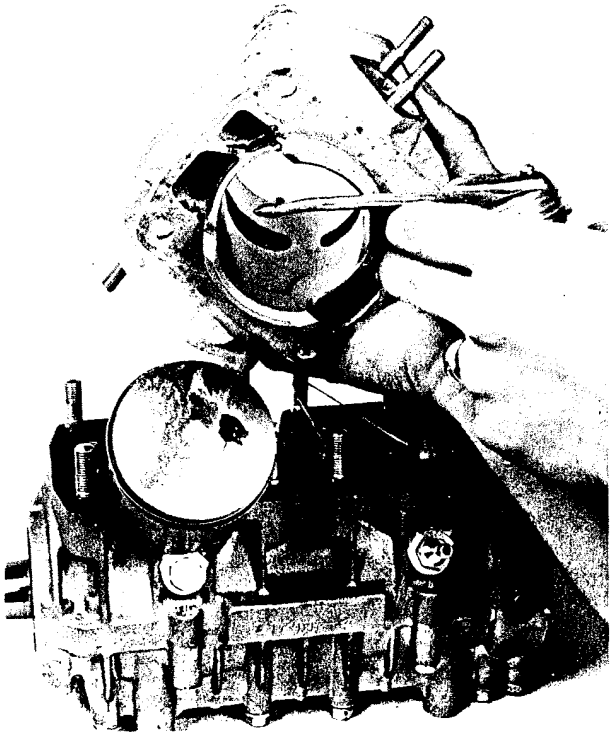
3. Install the piston pin circlips. Be sure all clips are correctly installed and in position before continuing. Open end of circlip must be positioned downward.

Fig. 4-98

A054

4. Apply a coat of oil to both the piston assembly and the cylinder. This will provide additional lubrication when the engine is first started.

Fig. 4-99



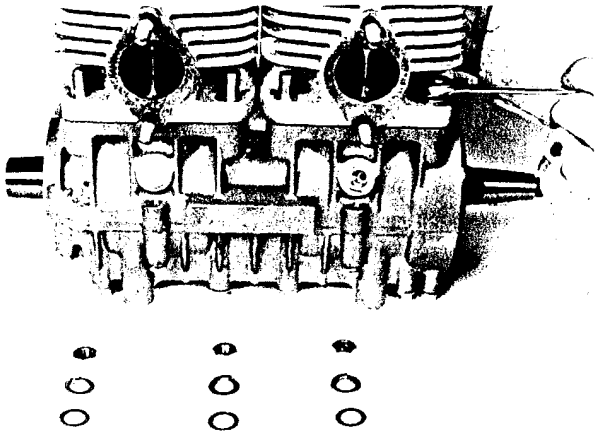
A154

5. Use a piece of hi-fax or a piston holder to hold the piston.

6. Use an Arctic ring compressor to seat rings and carefully slide cylinder onto piston. If cylinder seems to bind, do not use force because the rings could be damaged. Remove cylinder and try again.

7. Install cylinder base nuts and washers. DO NOT tighten.

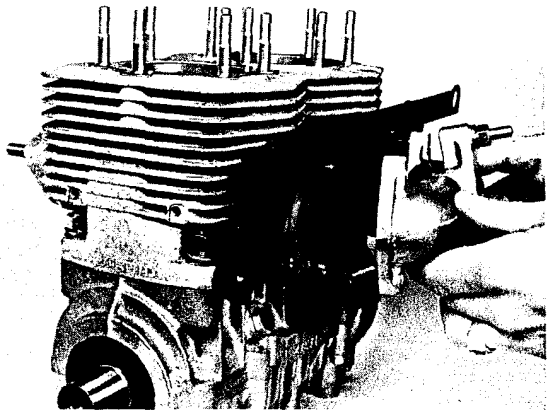
Fig. 4-100



A153

8. In sequence, install the intake gaskets, rear cowling, intake gaskets, insulators, gaskets and finally, the intake manifold.

Fig. 4-101



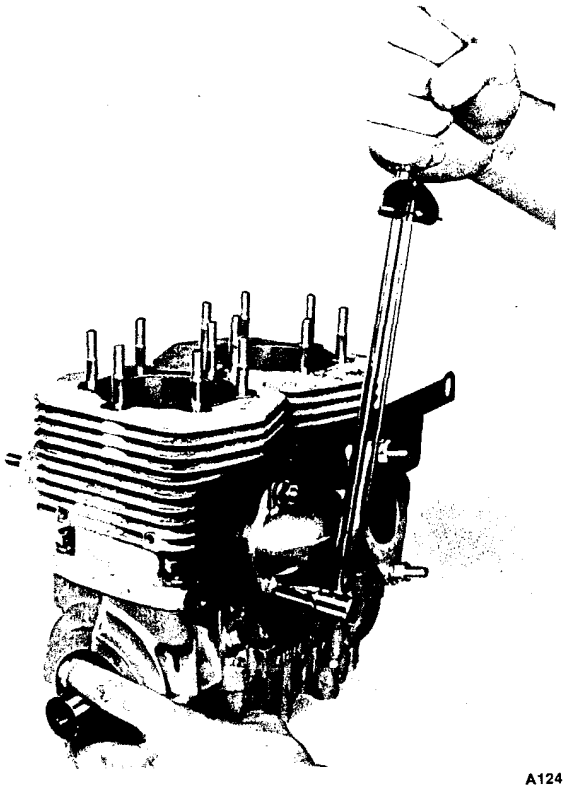
A123

9. Install the nuts and washers on the intake manifold studs. Tighten the nuts to 2.2 kg-m or 16 ft-lb using a crisscross pattern.

10. Tighten the front side cylinder base nuts; then remove intake manifold so rear cylinder nuts can be tightened. Tighten the base nuts to 3.0 - 4.0 kg-m or 22 - 29 ft-lb using a crisscross pattern.

NOTE: This procedure is necessary to properly index the intake manifold and cylinders. When cylinder base nuts are tight, apply RTV sealer on all intake gaskets; then install the manifold, gaskets and insulators. Tighten manifold to 1.5 - 1.9 kg-m or 11 - 14 ft-lb, using a crisscross pattern.

Fig. 4-102



A124

11. Coat both sides of the head gasket with RTV sealer and install.

Fig. 4-103

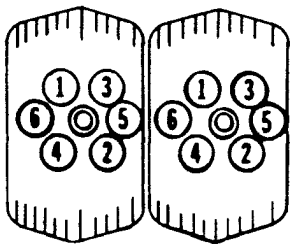
A148

12. Place the cylinder heads in position. Install the cylinder head nuts and washers.

NOTE: The long nuts are to be positioned on the most outward PTO and MAG side studs.

13. Tighten the head nuts to 1.8 - 2.2 kg-m or 13 - 16 ft-lb using the pattern shown.

Fig. 4-104

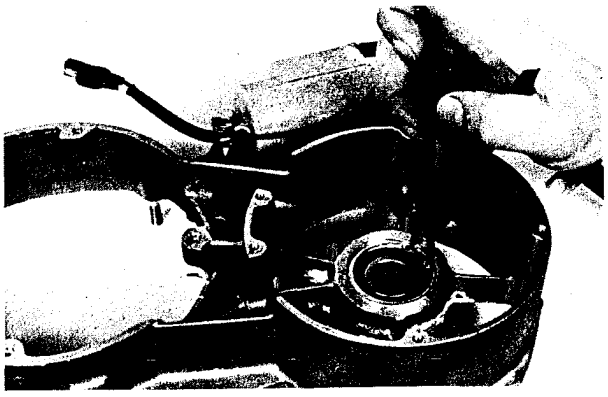


0725-320

14. Test the engine for any air leaks (See: Check Engine Sealing).

15. If the fan housing was not disassembled, proceed to step 24.

Fig. 4-105



A138

16. Carefully press the fan bearings into the fan case from the recoil side. Insert shim between bearings.

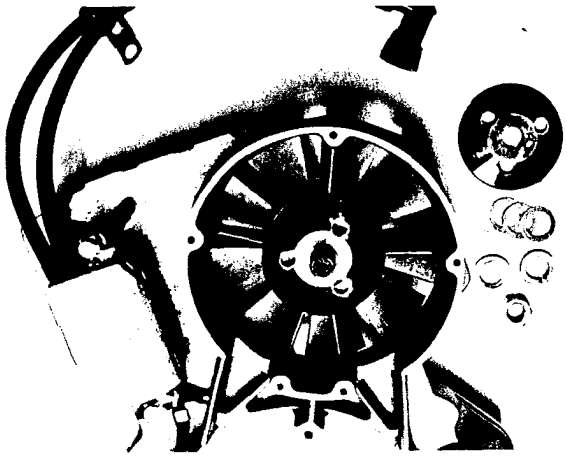
17. Insert snap ring in the groove of fan case.

18. Slide fan assembly through the bearings; then place spacer onto fan shaft.

19. Tap woodruff key into place on the fan shaft.

20. Place one of the driven fan pulleys on the fan shaft.

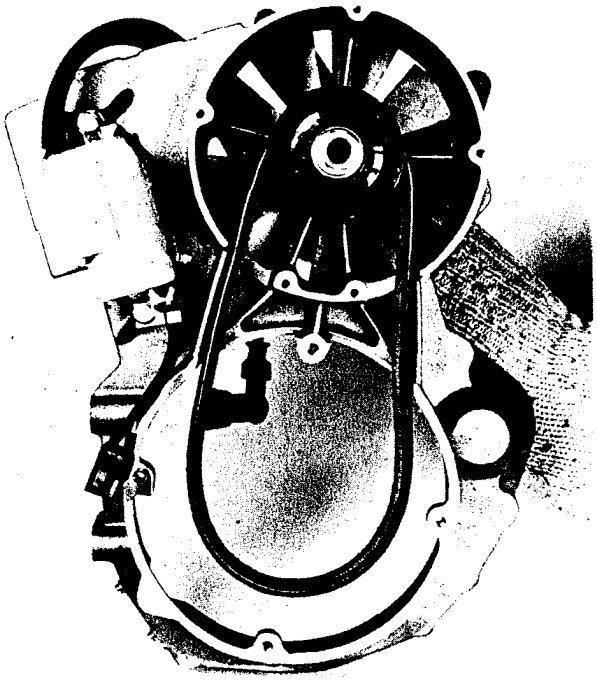
Fig. 4-106



A136

21. Install the shims, pulley, washers and nut on the fan shaft. Loop belt over the pulley.

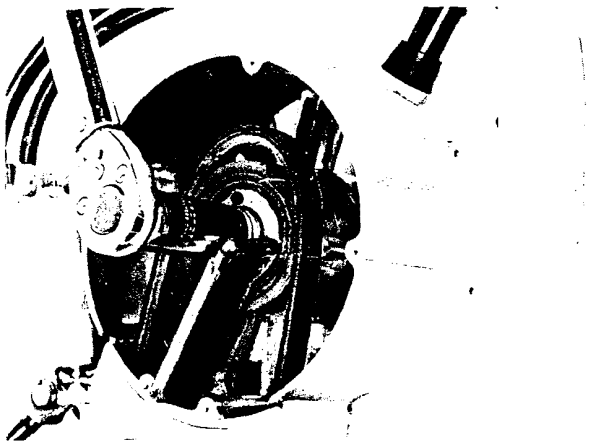
Fig. 4-107



A134

22. Using a fan holder, tighten the fan nut securely.

Fig. 4-108



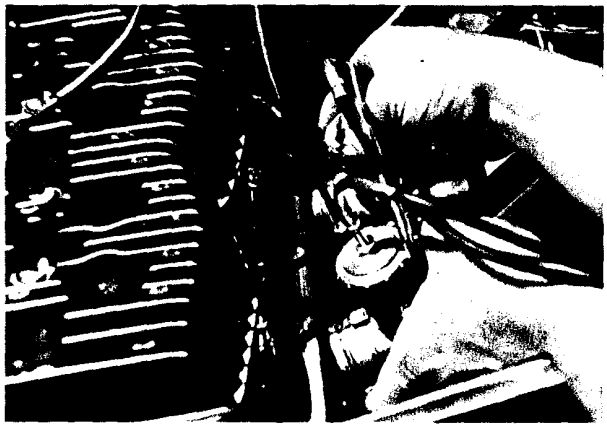
A354

23. Install the fan protector and mounting screws.

24. Move the magneto case into place on the MAG end of the crankcase.

25. Apply a liberal amount of Loc-Tite to each screw before installing. Use an impact driver to tighten the screws.

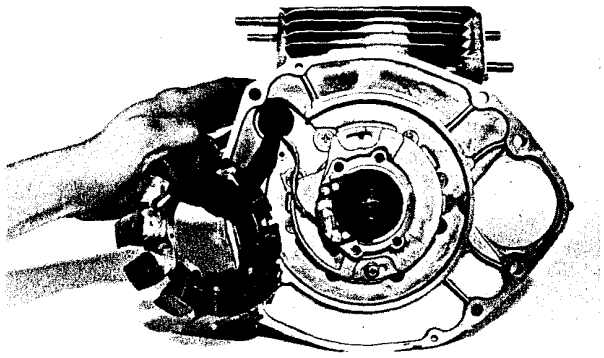
Fig. 4-109



A410

26. Place the magneto baseplate in position against the magneto case; then install the lower screw only. Align the timing marks as noted during disassembly.

Fig. 4-110

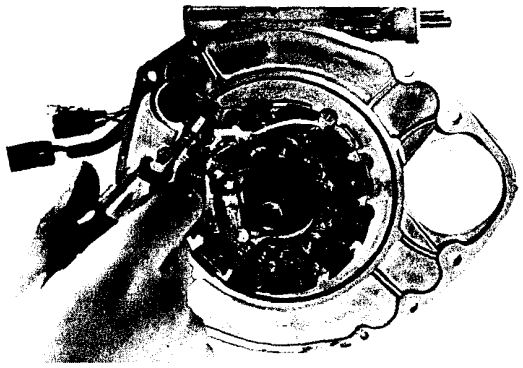


A409

27. Install the upper baseplate screw; then tighten both screws.

28. Position the coil ring against the baseplate. Install the wire harness clamp and secure with the mounting screw.

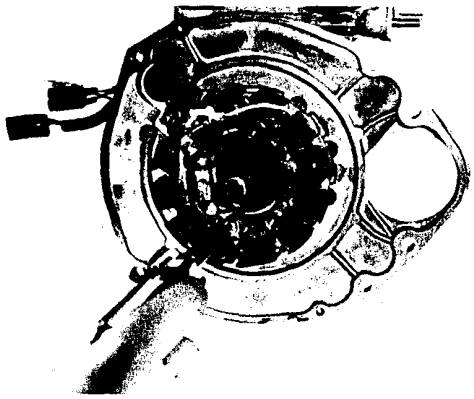
Fig. 4-111



A408

29. Apply a small amount of Loc-Tite to the coil ring screws and secure ring to the baseplate. Tighten securely.

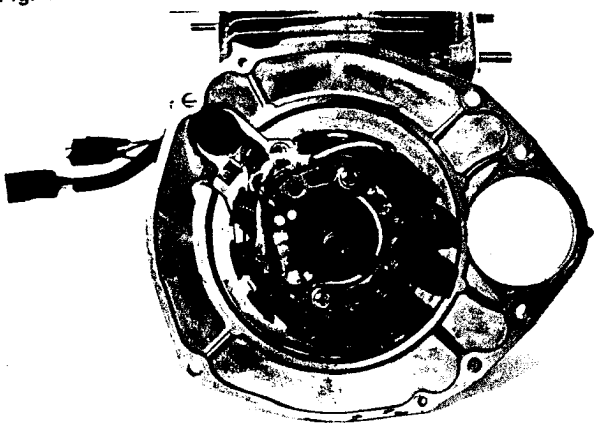
Fig. 4-112



A407

30. Insert the woodruff key in the slot in the crankshaft; then place flywheel in position. Make sure the magnets are clean and free of any foreign particles.

Fig. 4-113



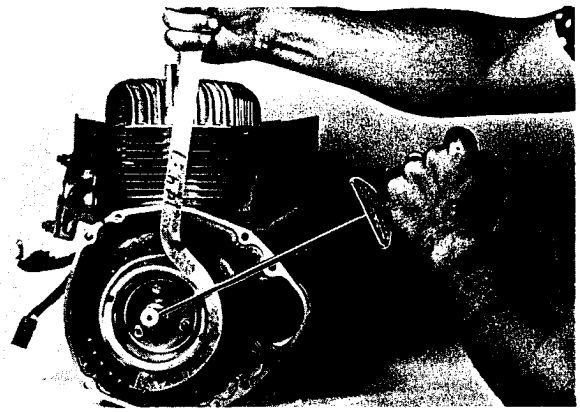
A406

31. Install the spacer washer, lock washer and flywheel nut. Install finger tight only.

32. Place the pulley starter and the fan drive pulley in position; then insert mounting bolts.

33. Use the Arctic spanner wrench (part no. 0144-007) to hold the engine when the flywheel nut is tightened to 6.8 - 8.7 kg-m or 49 - 63 ft-lb.

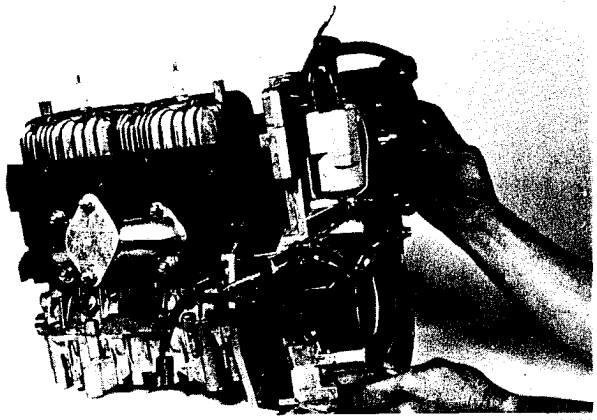
Fig. 4-114



A234

34. Slide the fan housing assembly into place. Install the nuts and washers on the fan housing studs. Tighten the nuts to 1.8 - 2.2 kg-m or 13 - 16 ft-lb.

Fig. 4-115



A233

35. Remove pulley starter and fan drive pulley. Place the fan drive belt in position. Secure pulley starter and fan drive pulley in place with the three cap screws.

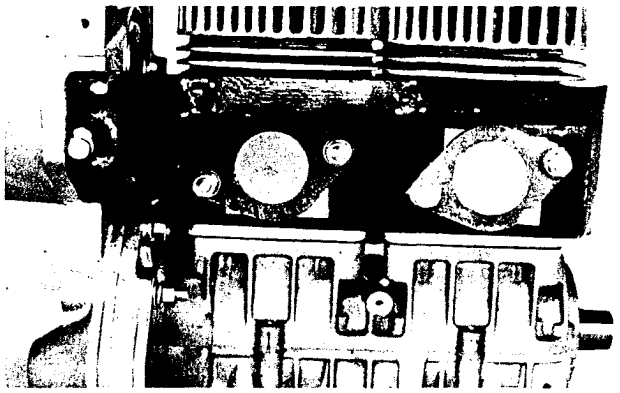
NOTE: The belt tension may not allow bolt holes to align. Start one bolt and then carefully rotate crankshaft until the remaining holes line up.

Fig. 4-116

A232

36. Install the front cowling.

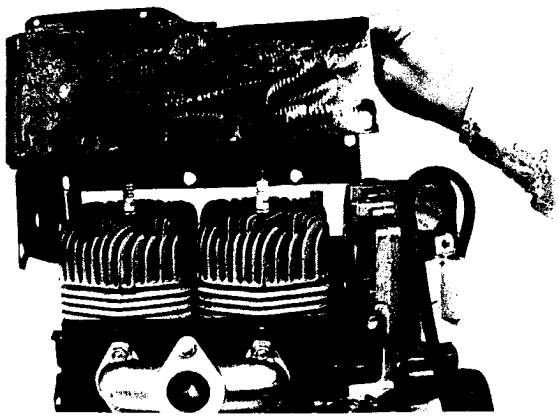
Fig. 4-117



A146

37. Install the upper cowling. Install all the screws and washers; then tighten.

Fig. 4-118



A145

38. Install the high tension wire bracket and clamp.

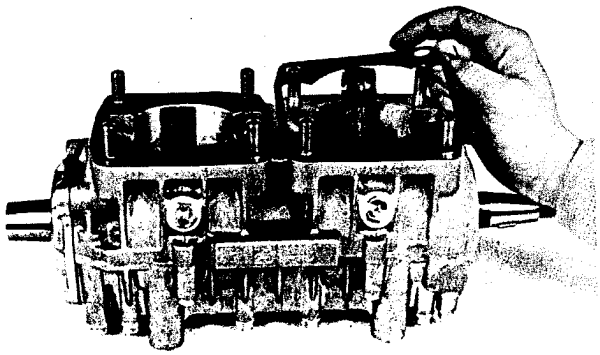
39. Fasten motor plate to engine. Tighten cap screws to 7.6 kg-m or 55 ft-lb.

40. Install exhaust manifold. Tighten nuts to 1.5 - 1.9 kg-m or 11 - 14 ft-lb.

AC50F2

1. Apply a thin coat of RTV sealer to both sides of the base gaskets. Place gaskets in position.

Fig. 4-119

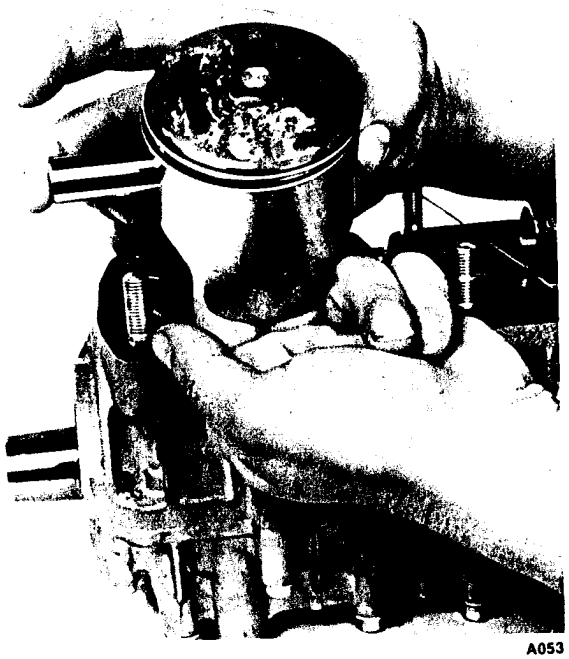


A096

2. Apply oil to both the piston pin and bearing before installation.

3. Position the pistons with the arrow on top of piston pointing toward the exhaust side; then install the piston pin.

Fig. 4-120



A053

4. Install the piston pin retaining clips so that the open end of the clip is opposite notch in piston. Be sure all clips are correctly installed and in position before continuing.

Fig. 4-121

A054

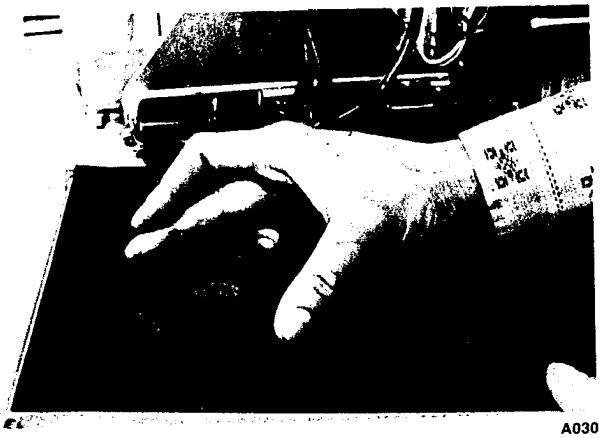
5. Use a piece of hi-fax or a piston holder to hold the piston.

6. Use an Arctic ring compressor to seat rings; then carefully slide cylinder onto piston. If cylinder seems to bind, remove cylinder and try again.

7. Place exhaust manifold in position and tighten to correctly index cylinders. Tighten the base nuts to 3.0 - 4.0 kg-m or 22 - 29 ft-lb using a crisscross pattern.

8. Check intake insulator blocks for trueness on a surface plate.

Fig. 4-122



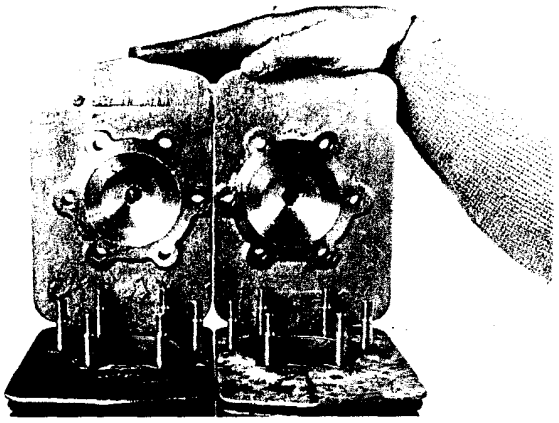
A030

9. Apply RTV to the carburetor gaskets; then install. Slide insulator blocks onto cylinder studs. Apply RTV to rubber carburetor flange; then install and tighten to 1.5 - 1.9 kg-m or 11 - 14 ft-lb.

10. Apply a thin coat of RTV to both sides of the head gaskets and install.

11. Install cylinder heads. Install nuts and washers.

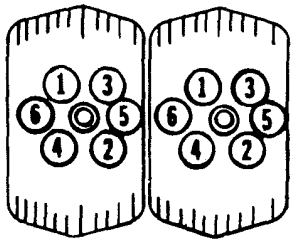
Fig. 4-123



A037

12. Tighten head nuts to 2.2 kg-m or 16 ft-lb using the pattern shown.

Fig. 4-124



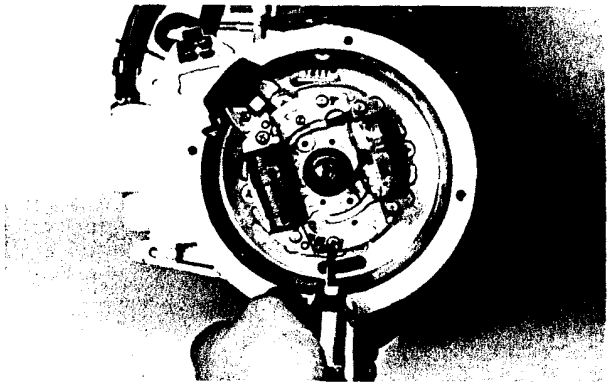
0725-320

13. Check the engine for any air leaks (See: Check Engine Sealing).

14. Install flywheel housing; apply Loc-Tite to screws and tighten with impact driver.

15. Install the magneto baseplate assembly. Align the marks made during disassembly; then install and tighten fasteners.

Fig. 4-125



A017

16. Tighten the engine wiring harness clamp. This will prevent the flywheel from contacting harness.

17. Check the flywheel magnets for any foreign particles. Be sure the magnets are clean. Install flywheel over woodruff key and crankshaft. Install a spacer washer, lock washer and nut. Tighten the flywheel nut to 6.8 - 8.7 kg-m or 49 - 63 ft-lb.

18. Install the starter pulley with the three cap screws and lock washers. Tighten to 0.6 kg-m or 5 ft-lb.

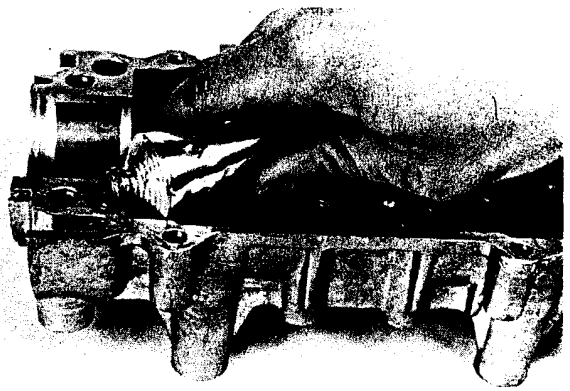
19. Install the exhaust manifold. Tighten nuts to 1.5 - 1.9 kg-m or 11 - 14 ft-lb.

AA28F2/F3, AA34F3

1. Lubricate the crankshaft seals by applying a liberal amount of grease between double lip of seal; then slide seals onto crankshaft with spring side of seal toward bearing.

2. Apply a thin coat of crankcase sealer to both halves of the crankcase. Always use a sealer that remains pliable when dry (such as Liquid Gasket or RTV silicone sealer).

Fig. 4-126

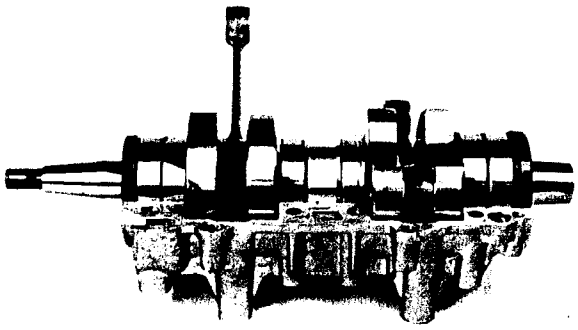


A161

3. Lay a piece of #50 cotton thread on lower half of crankcase just to the inside of the crankcase bolt holes.

4. Install crankshaft in bottom half of crankcase. Be sure the alignment hole in each bearing is positioned over the dowel pin in the crankcase. If the bearings are not properly seated, the case halves will not bolt together tightly. Be sure the C-ring is installed in the center section of the crankcase halves.

Fig. 4-127

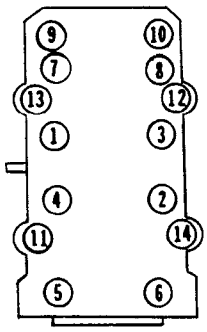


A160

5. Install the top half of the crankcase; then insert bolts and finger tighten.

6. Tighten the bolts to the required torque value in increments of 0.5 kg-m or 4 ft-lb using the pattern shown.

Fig. 4-128

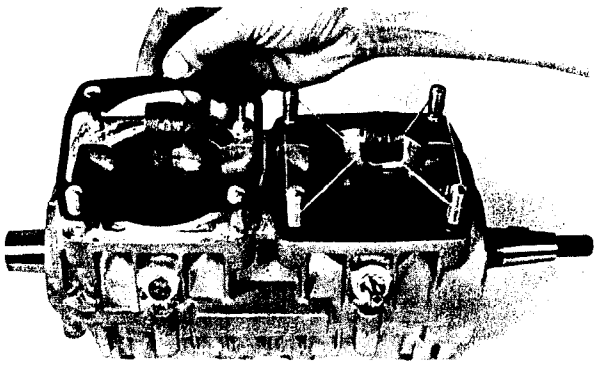


0725-319

CRANKCASE BOLT TORQUE		
Bolt Size	**kg-m**	**ft-lb**
6 mm	0.8 - 1.0	6 - 7
8 mm	1.8 - 2.2	13 - 16
10 mm	2.0 - 3.0	15 - 22

7. Apply a thin coat of RTV to both sides of the base gasket; then install gasket.

Fig. 4-129



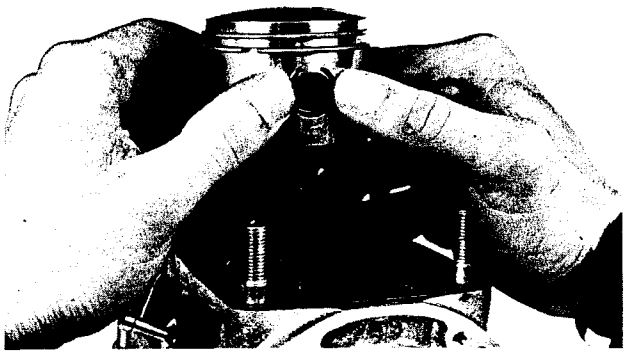
A254

8. Install the piston pin bearings in the connecting rod upper ends.

9. Apply oil to the piston pin and bearing. Install the pistons with the arrow on top of piston pointing toward the exhaust side.

10. Install the piston pin retaining clips with the open end positioned upward. Be sure all clips are in position.

Fig. 4-130

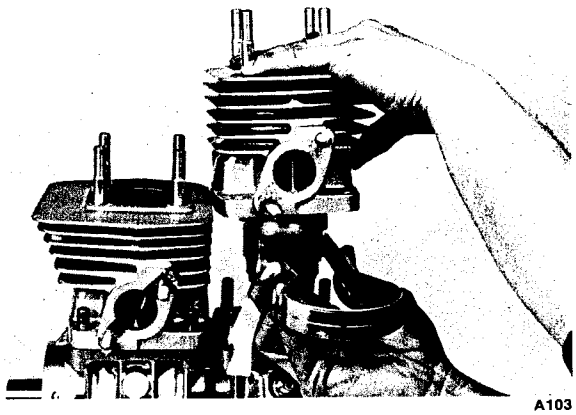


A045

11. Apply a coat of oil to the cylinder wall and piston. This will provide additional lubrication when the engine is first started.

12. Use a piece of hi-fax or a piston holder to hold the piston.

Fig. 4-131

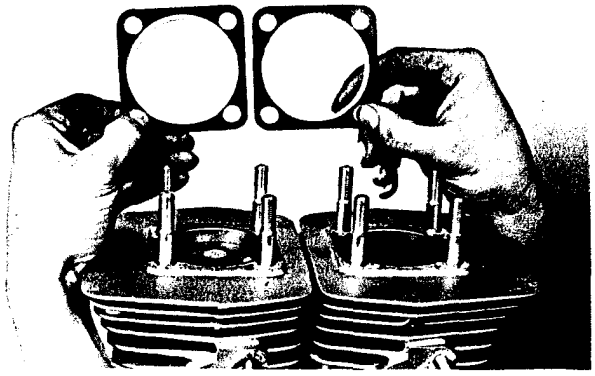


A103

13. Use an Arctic ring compressor to seat rings; then carefully slide cylinder onto piston. If cylinder seems to bind, remove and try again. Install base nuts but do not tighten.

14. Apply a thin coat of RTV sealer to both sides of the head gaskets; then install.

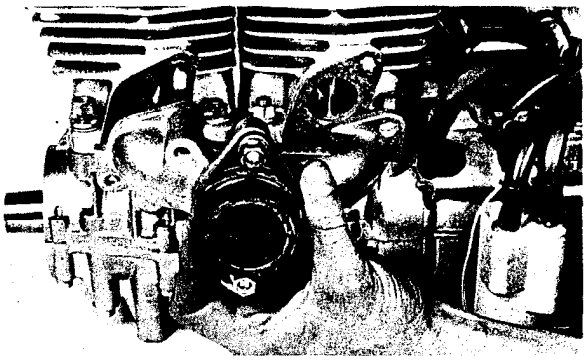
Fig. 4-132



A041

15. Apply a thin coat of RTV to intake manifold gaskets. Place the intake and exhaust manifolds in position. Tighten nuts to correctly index cylinders.

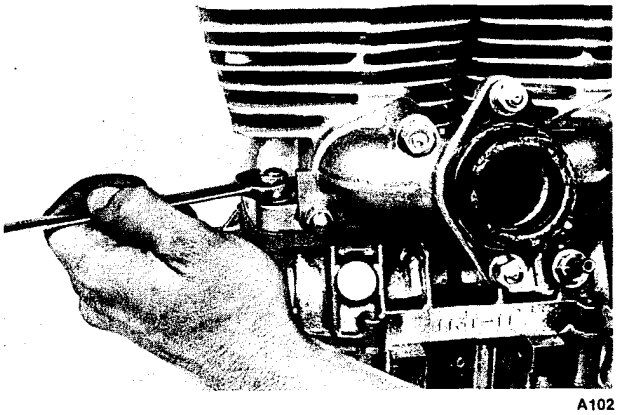
Fig. 4-133



A117

16. Now tighten the cylinder base nuts to 3.0 - 4.0 kg-m or 22 - 29 ft-lb, using a crisscross pattern.

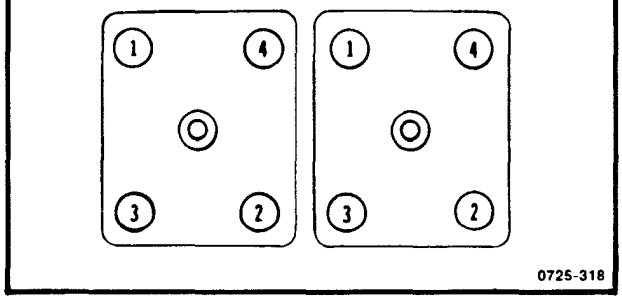
Fig. 4-134



A102

17. Install cylinder heads, nuts and washers. Tighten nuts to 3.0 - 4.0 kg-m or 22 - 29 ft-lb using the sequence shown.

Fig. 4-135



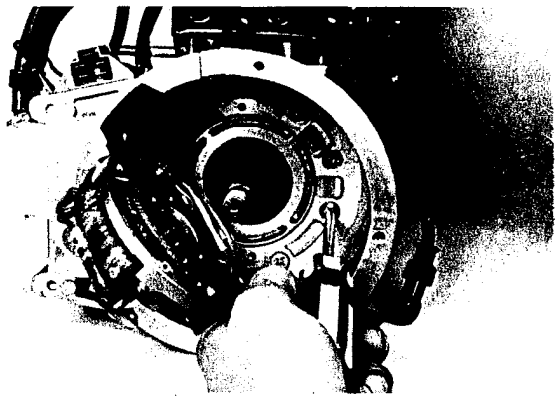
0725-318

18. Check the engine for any air leaks (See: Check Engine Sealing).

19. Move the magneto housing into place on the MAG end of the crankcase.

20. Apply Loc-Tite to each screw before installing. Use an impact driver to tighten the screws.

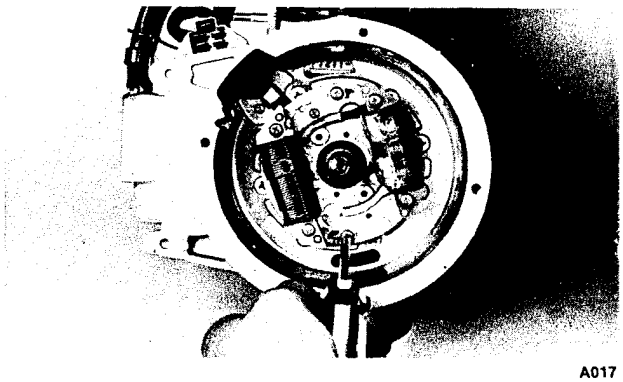
Fig. 4-136



A020

21. Install the magneto baseplate assembly. Align the marks made during disassembly. Install and tighten mounting screws; then tighten the magneto wiring clamp in the magneto case.

Fig. 4-137

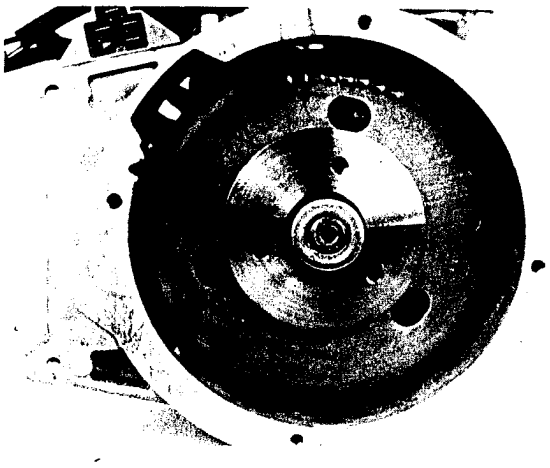


A017

22. Place the woodruff key in the slot on the MAG end of crankshaft.

23. Check the flywheel for any metallic particles. Be sure magnets are clean. Install flywheel over woodruff key; then install spacer.

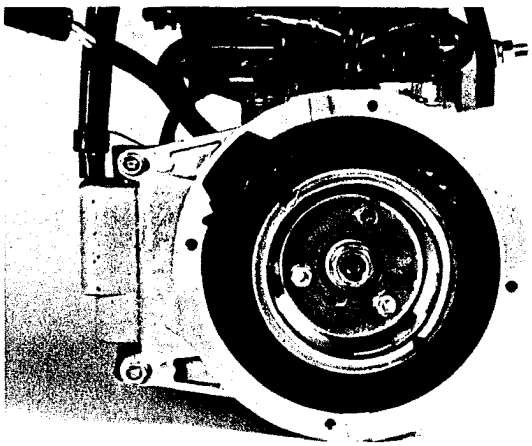
Fig. 4-138



A015

24. Place the starter pulley in position and secure with the three bolts and washers. Install flywheel lock washer and nut.

Fig. 4-139



A114

25. Using a spanner wrench to hold the flywheel, tighten the flywheel nut to 6.8 - 8.7 kg-m or 49 - 63 ft-lb.

AB25F1

1. Lubricate the crankshaft seals by applying a liberal amount of grease between double lip of the seal; then slide seals onto crankshaft.

NOTE: Make sure spring side of seal is placed against bearing.

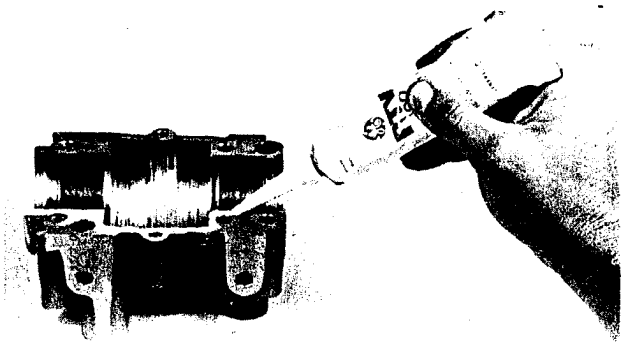
Fig. 4-140

A437

2. Lubricate the connecting rod bearings and the crankshaft bearings with oil.

3. Apply a thin coat of crankcase sealer to both halves of the crankcase. Always use a sealer that remains pliable when dry (such as liquid gasket or RTV silicone seal).

Fig. 4-141

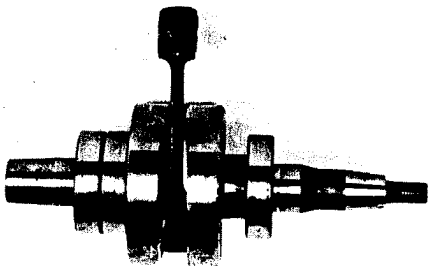


A461

4. Install crankshaft in bottom half of crankcase. Be sure the alignment hole in each bearing is positioned over the dowel pin in the crankcase.

5. If the bearings are not properly seated, the crankcase halves will not bolt together tightly.

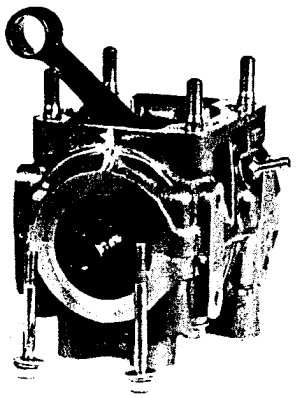
Fig. 4-142



A431

6. Install the top half of the crankcase. Install the various sized bolts finger tight only. At this time, note the two different lengths of the PTO side crankcase bolts.

Fig. 4-143

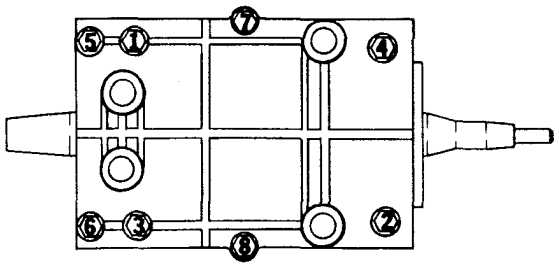


A429

7. Tighten the bolts to the required torque value and in the proper sequence in increments of 0.4 kg-m or 3 ft-lb.

CRANKCASE BOLT TORQUE		
Bolt Size	**kg-m**	**ft-lb**
6 mm	0.8 - 1.0	6 - 7
8 mm	1.8 - 2.2	13 - 16
10 mm	2.0 - 3.0	15 - 22

Fig. 4-144

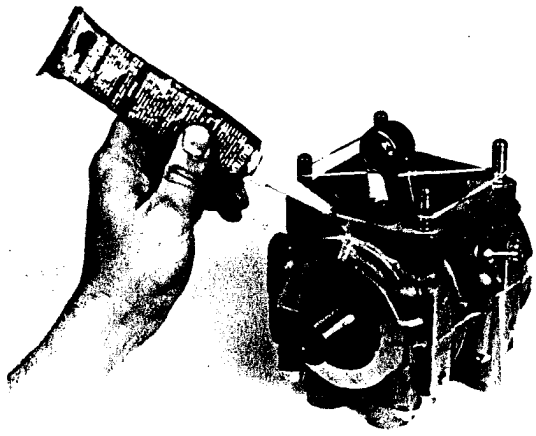


0725-491

8. Tip the engine upright.

9. Apply a thin coat of RTV sealer to the cylinder base gasket surface. Install the base gasket; then again apply a small amount of RTV sealer to the gasket surface.

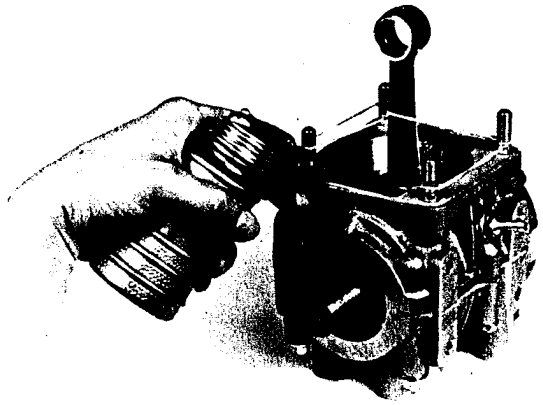
Fig. 4-145



A440

10. Lubricate the lower rod bearing.

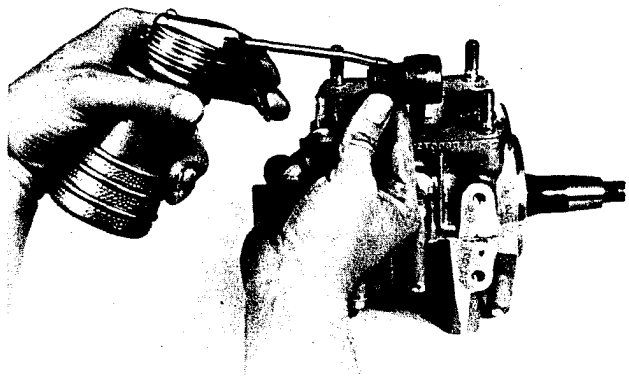
Fig. 4-146



A441

11. Apply oil to the small connecting rod bearing.

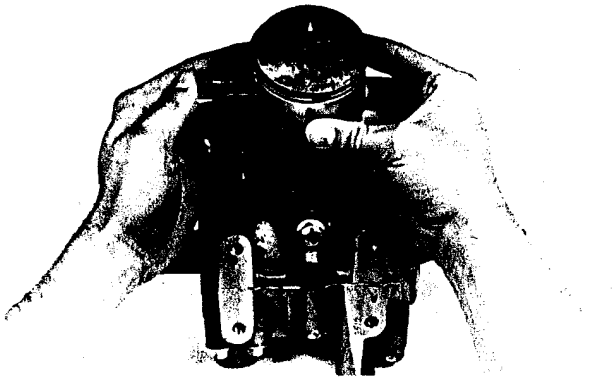
Fig. 4-147



A442

12. Place the piston assembly over the connecting rod and bearing in such a manner that the arrow on the piston points toward the exhaust side of the engine. Install the piston pin carefully.

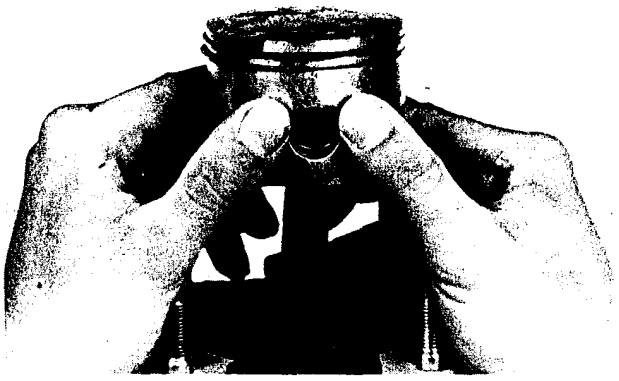
Fig. 4-148



A443

13. Secure the piston pin in position with the circlips. Make sure the circlips are correctly positioned before proceeding with engine assembly.

Fig. 4-149

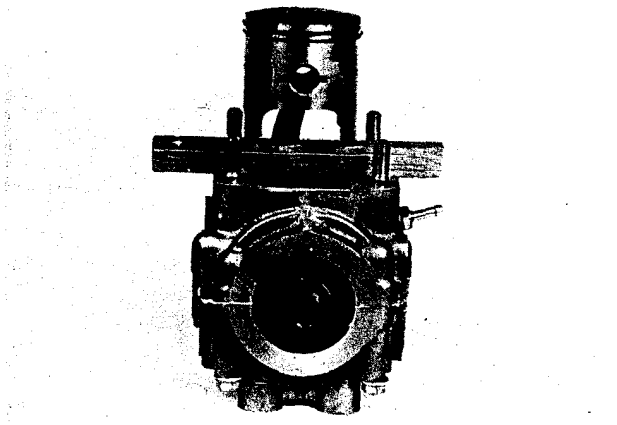


A444

14. Apply a coat of oil to the piston and piston rings.

15. Using a small piece of wood or hi-fax, place the piston flat against the surface.

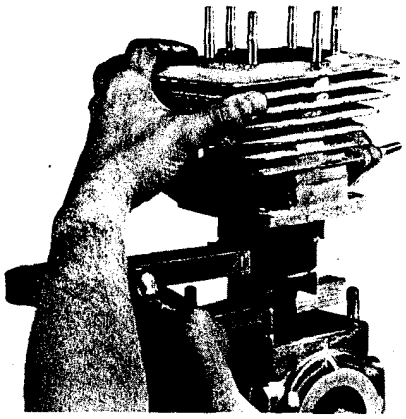
Fig. 4-150



A447

16. Using a ring compressor carefully slide the cylinder over the piston assembly; make sure to slide the cylinder straight down. If binding occurs, do not force. Remove and try again. Forcing the cylinder will damage the piston or piston rings.

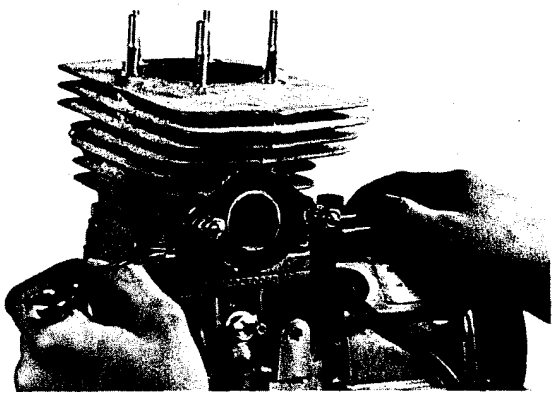
Fig. 4-151



A448

17. Place the lock washers and nuts in position and tighten cylinder base nuts to 3.0 - 4.0 kg-m or 22 - 29 ft-lb, using a crisscross pattern.

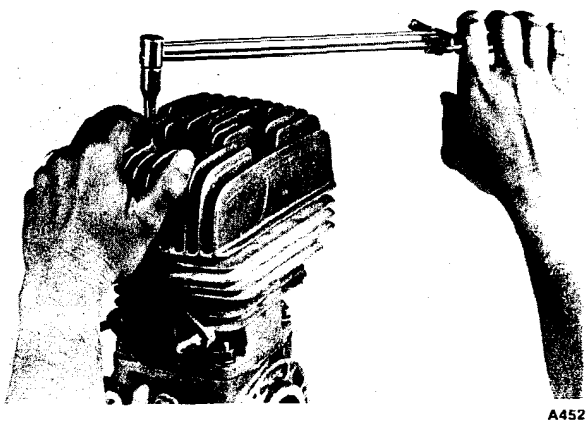
Fig. 4-152



A421

18. Place the cylinder head gasket over the cylinder head studs; then place the cylinder head in position. Install the nuts and washers that secure the head in place; then tighten the nuts to 5.53 - 5.95 kg-m or 13 - 16 ft-lb using a crisscross pattern.

Fig. 4-153



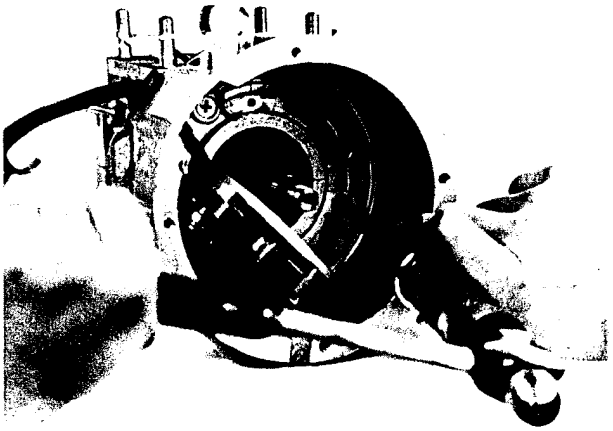
A452

19. Check engine for any air leaks (See: Check Engine Sealing).

20. Move the magneto case into position against the crankcase. Install the eight screws, noting that the two slightly shorter screws are to be positioned nearest the wiring harness grommet. Tighten the screws using an impact driver and hammer.

■ **NOTE: Before installing screws, apply a thread locking agent such as Loc-Tite on each screw.**

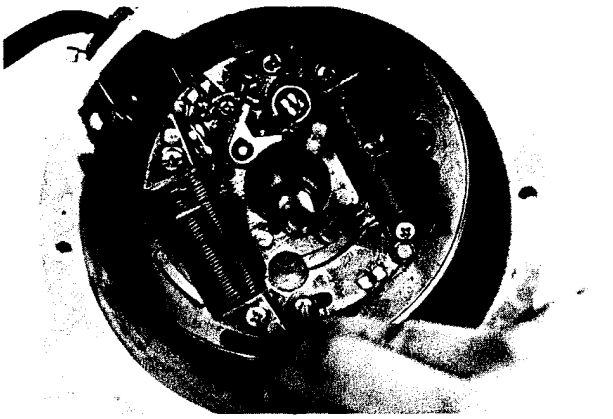
Fig. 4-154



A417

21. Move the magneto baseplate into position against the magneto case. Align the scribe marks which were made during disassembly. Install the two baseplate screws and tighten securely.

Fig. 4-155



A416

22. Tighten the magneto wiring clamp in the magneto case.

23. Place the woodruff key in the slot on the MAG end of the crankshaft. Check the flywheel for any metallic particles. Be sure magnets are clean. Install flywheel over woodruff key; then install spacer washer, lock washer and flywheel nut. DO NOT tighten at this time. Place the starter pulley against the magneto and secure with three bolts. Using a spanner wrench to hold the starter pulley, tighten the flywheel nut to 6.8 - 8.7 kg-m or 49 - 63 ft-lb.

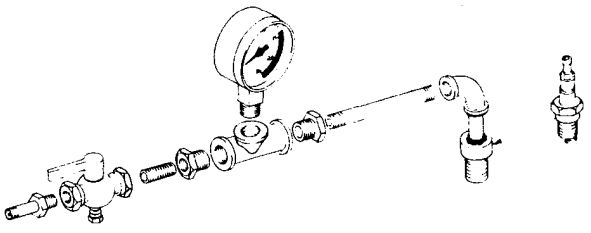
Fig. 4-156

A412

Check Engine Sealing

1. Using a commercial pressure tester or a homemade tester such as the one shown, check the engine for leaks.

Fig. 4-157

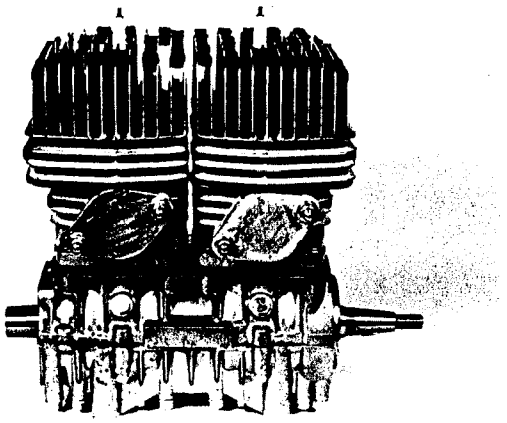


0725-108

2. Install port plugs or covers on both intake and exhaust sides.

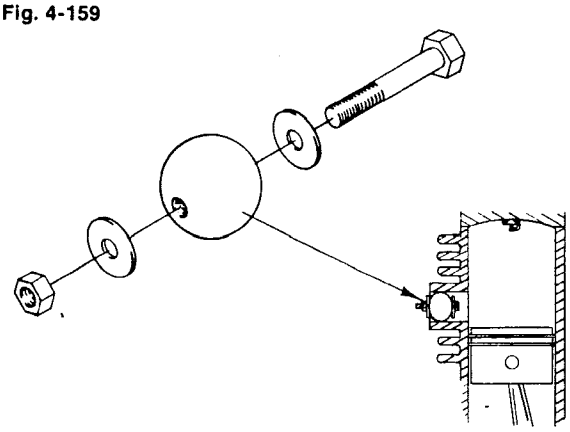
■ **NOTE: Expandable port plugs can be made by drilling a hole through a rubber ball; then insert a bolt with washers and a nut. Place a ball in port. Tighten the nut to seal the port.**

Fig. 4-158



A226

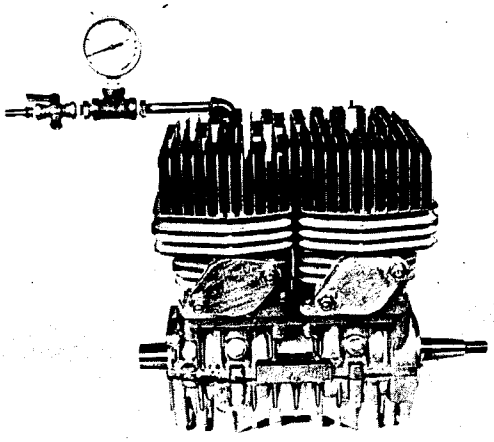
Fig. 4-159



0725-149

3. Install tester in one of the cylinders. Place a spark plug into other cylinder.

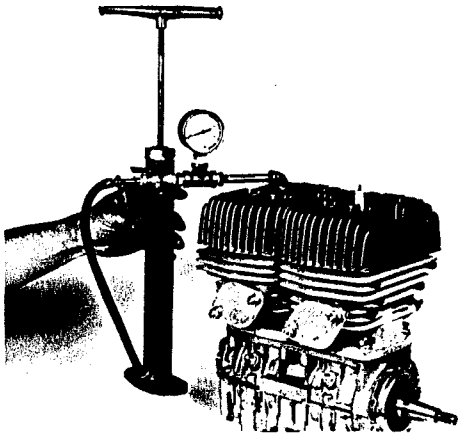
Fig. 4-160



A227

4. Using a hand pump, pressurize the crankcase to 12 pounds and close the valve. DO NOT EXCEED 15 pounds of pressure or crankshaft end seals will be damaged.

Fig. 4-161

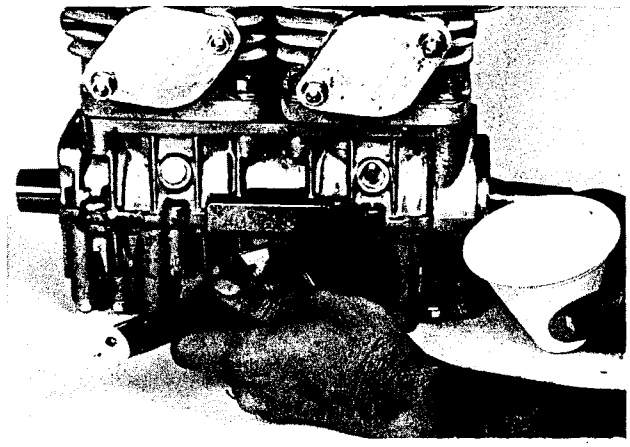


A228

5. Watch the gauge and determine the rate of leakage. Pressure must not drop more than 1 pound per minute per cylinder or 2 pounds per minute for a twin-cylinder engine having a labyrinth-type center seal.

6. If the pressure drops more than the accepted rate (see step 5), check for air leaks with soapy water and a brush, or completely submerge the engine in water (engine must still be pressurized). Bubbles will help locate the leak. If engine is submerged, the electrical system must NOT be on the engine.

Fig. 4-162



A229

7. If no leaks are evident, remove pressure gauge and port plugs; then proceed to final assembly.

Recoil Starter Servicing

Remove Recoil Starter

1. Turn ignition switch to OFF position.
2. Open hood.
3. Remove the four bolts securing recoil assembly to the magneto housing.

● CAUTION ●

Before removing last bolt, grasp the recoil to prevent a sudden retraction of the recoil to the instrument panel.

4. Tie a slip knot in the recoil rope and slowly allow the rope to retract against the recoil housing. If recoil is to be removed from chassis, remove the knot at the starter handle, then thread rope through console.

Disassemble Recoil Starter

1. Clamp the recoil in a vise.
2. While exerting downward pressure on the drive plate, remove the nut, lock washer and flat washer.

Fig. 4-163

A190

3. Slowly release the drive plate retainer cover. Lift the cover free of spring.

Fig. 4-164

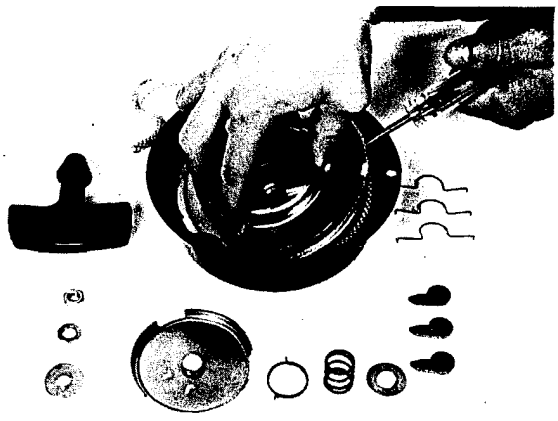
A191

4. Remove return and compression springs.
5. Remove the three pawl springs; then remove the 3 starter pawls.

■ NOTE: Further recoil disassembly is not required unless there is a problem with the main spring or the recoil rope.

6. Rotate the recoil roller counterclockwise until the notch of the reel is near the recoil rope bushing. Using a piece of stiff wire, guide the rope into the notch and slowly allow the roller to retract until all main spring tension is released.
7. Carefully lift the recoil roller free of case, making sure that the recoil spring does not accidentally disengage from the recoil case.

Fig. 4-165



A189

8. Remove the recoil spring from the recoil case by lifting the spring end up and out. Hold remainder of recoil spring with thumbs and alternately release each thumb to allow the recoil spring to gradually release from the recoil case.

Inspect Recoil Parts

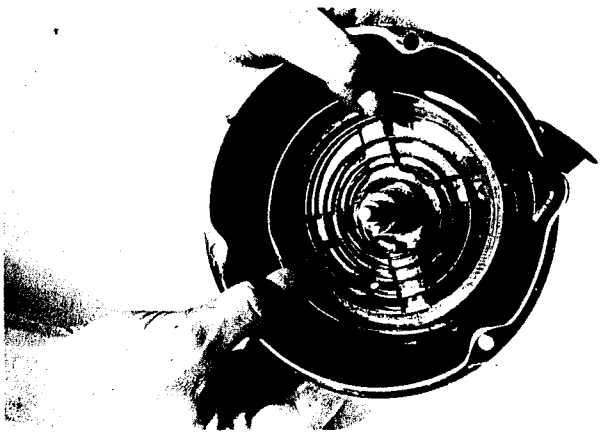
NOTE: Whenever a part is worn excessively, cracked, defective or damaged in any way, replacement is necessary.

1. Inspect all springs, shims, washers, pawls and retaining cover for excessive wear or damage.
2. Inspect the recoil reel and housing for cracks or damage. Also check the center hub for cracks and excessive wear.
3. Check the recoil rope for breaks or fraying.
4. Inspect the main spring for cracks, crystallization and abnormal bends.
5. Inspect the starter handle and end piece for damage, cracks or deterioration.

Assemble Recoil Starter

1. Hook the end of the recoil spring around the mounting lug in the recoil case.
2. Continue to insert the recoil spring, winding in a counterclockwise direction. Insert windings one at a time until the complete recoil spring is installed.

Fig. 4-166



A192

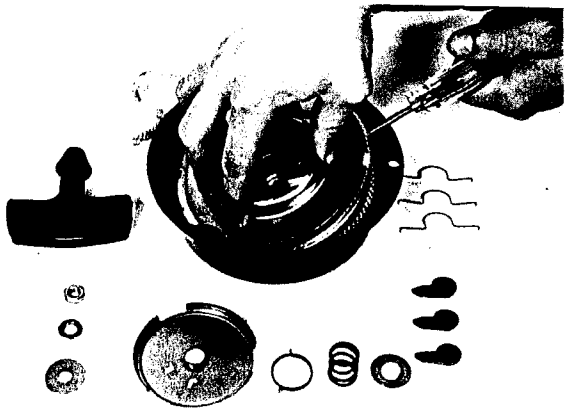
NOTE: Recoil spring must seat evenly on the recoil housing to ensure correct installation.

3. If a recoil rope is to be installed, secure a knot in one end of the rope and insert the rope through the hole in the recoil roller; then wrap rope counterclockwise around roller, leaving about 1/2 meter of rope free of roller.
4. Align the hook in the end of the recoil spring with the notch in the recoil roller.

NOTE: At this time a light oil may be used to lubricate both the spring and roller hub and also to prevent corrosion.

5. Carefully slide the recoil roller over hub and hook spring to the roller.
6. When the roller is seated correctly in the recoil case, place spring seat against the recoil roller.

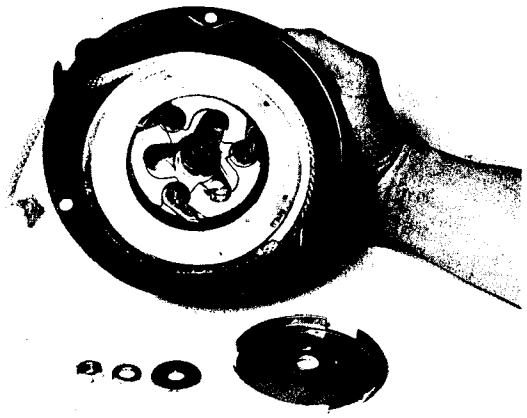
Fig. 4-167



A189

7. Install the pressure spring and return spring in the recoil; then place the three recoil pawls in position.
8. Slide end of recoil rope through rope guide of recoil; then install recoil grip on the end of the rope.
9. Install the three pawl springs in the recoil pawls.

Fig. 4-168



A191

10. Use a hooked wire to guide the return spring when installing the drive plate. Rotate the plate until spring is in position.

NOTE: Return spring pointed end must seat in the reel. Loop must be facing upward.

11. Secure drive plate in place with flat washer, lock washer and nut. Tighten nut to 2.21 kg-m or 16 ft-lb.

12. With about 1/2 meter of rope exposed, hook and install the rope in the notch of the recoil roller. Use this notch for adequate clearance. Rotate the roller three or four turns to correctly tension recoil; then pull recoil rope to release it from the notch.

Fig. 4-169

A190

13. Pull recoil rope out two or three times to check for correct tension. If tension is not sufficient, increase tension one turn at a time as in step 12.

Install Recoil Starter

1. Place recoil assembly in position against magneto housing.

2. Secure recoil in place with 4 recoil bolts. Tighten bolts to 0.7 kg-m or 5 ft-lb.

NOTE: Just before finally tightening bolts, grasp the recoil handle and slowly pull until the starter pawls engage. Then tighten bolts. This will help center the recoil on the mounting bolts.

3. Thread recoil rope through rope guide bushing in instrument panel.

4. Release the slip knot in the rope.

Install Pantera Engine

1. Place the exhaust gaskets in position on the engine; then place the exhaust manifold on the engine. Secure the manifold with the four lock washers and nuts. Tighten the nuts to 1.8 - 2.2 kg-m or 13 - 16 ft-lb.

2. Place the motor plate in position on the engine crankcase.

3. Since the Pantera motor plate is adjustable, special care must be taken when installing the engine. Place the four spacer washers between the engine and the motor plate. Set the adjustment plate in place over the intake side mounting holes.

4. Install the two cap screws in place in the forward set of holes; then install the two hex key cap screws in the rear set of holes. DO NOT tighten at this time.

5. Place the engine in position on the chassis. Make sure that all the motor mounts are correctly in place.

6. Install the five cap screws, lock washers and flat washers that secure the motor plate in position. Tighten the cap screws to 2.9 - 3.6 kg-m or 21 - 26 ft-lb.

7. Move the engine snubber into place and secure with two cap screws and lock nuts.

8. Using a scale, measure the distance between the centers of the engine PTO shaft and the driven clutch shaft. The distance should be exactly 12.0 inches. If the distance is not correct, adjust the snubber until the correct measurement is reached.

9. Carefully tip the snowmobile on the side. Use cardboard to protect against scratching. Tighten the four motor plate mounting bolts to 7.6 kg-m or 55 ft-lb. Install plugs in belly pan.

10. Make sure the snubber fits snug against the engine cases; then tighten the snubber jam nut.

11. Secure recoil in place with four bolts. Tighten the bolts to 0.7 kg-m or 5 ft-lb.

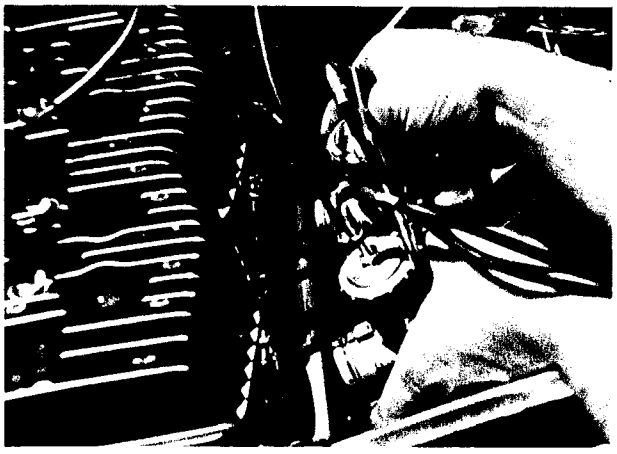
NOTE: Just before recoil bolts are tightened, pull the recoil so the starter pawls are engaged. This will correctly center the recoil; then tighten bolts.

12. Connect the impulse line to the crankcase fitting. Also, connect the main wiring harness to the engine harness; then connect the high tension coil plug to the engine harness.

13. Slide the carburetor(s) into position and tighten the flange clamp.

14. Move the air silencer into place and secure to the carburetor(s).

Fig. 4-170



A401

15. Install the drive clutch on the crankshaft. Tighten the cap screw to 7.6 - 8.3 kg-m or 55 - 60 ft-lb. Install the drive belt.

16. Secure the pulse charger to the exhaust manifold with two springs.

17. Install the hood.

Install Panther/ Cheetah Engine

1. Be sure the exhaust manifold gaskets are in place; then install the exhaust manifold and secure with nuts and washers. Tighten nuts to 1.8 - 2.2 kg-m or 13 - 16 ft-lb.

2. Place the motor plate in position and secure with cap screws and lock washers. Tighten the cap screws to 7.6 kg-m or 55 ft-lb. Connect exhaust manifold springs to the muffler.

3. Install the drive clutch on the crankshaft. Tighten the cap screw to 7.6 - 8.3 kg-m or 55 - 60 ft-lb.

4. Set engine into the front end of the snowmobile.

5. Align rear motor mounts with mounting holes. Slide mounts into mounting holes.

6. Position motor plate over front motor mounts.

7. Install the lock nuts and washers on the front motor mount studs. Tighten lock nuts to 2.9 - 3.6 kg-m or 21 - 26 ft-lb.

8. Tip the snowmobile on the side. Install the lock nuts and washers on the rear motor mount studs. Tighten lock nuts to 2.9 - 3.6 kg-m or 21 - 26 ft-lb.

9. Tip the snowmobile upright.

10. Secure recoil in place with 4 bolts. Tighten bolts to 0.69 kg-m or 5 ft-lb.

NOTE: Just before recoil bolts are tightened, pull the recoil so the starter pawls are engaged. This will correctly center the recoil; then tighten bolts.

11. Plug the engine connector into the main wiring harness.

12. Connect the impulse line to the crankcase impulse fitting.

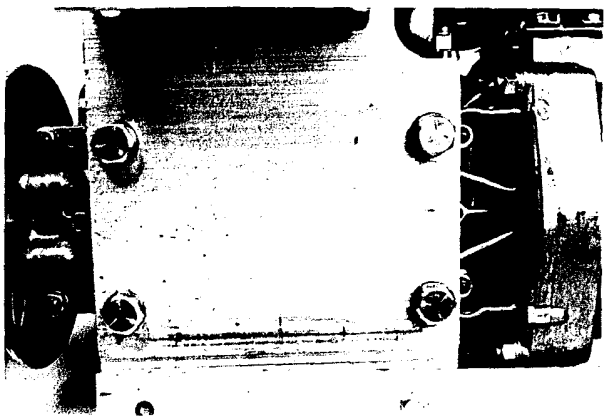
13. Slide the carburetor into carburetor flange; then tighten the clamp.

14. Install the drive belt; then secure belt guard with retaining pins.

Install Jag Engine

1. Set the motor plate on the engine crankcase and bolt in place. Tighten bolts to 7.6 kg-m or 55 ft-lb.

Fig. 4-171



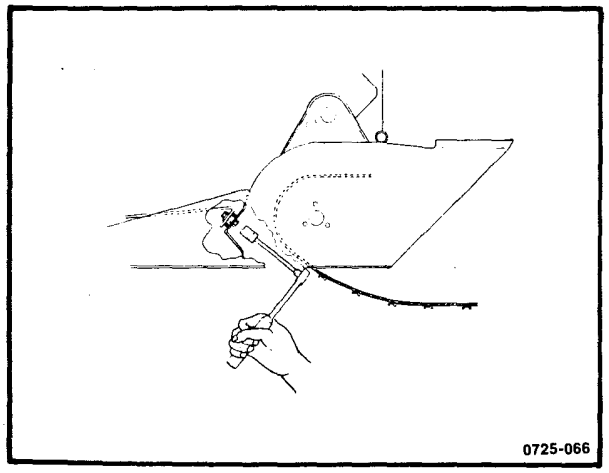
A033

2. Guide rear motor mounts into the rear mount holes in front end; then set engine onto front motor mount studs and install nuts.

NOTE: Be sure to install any shims which were removed during disassembly. Also be sure that exhaust system bracket is in place.

3. Tip snowmobile onto MAG side and install nuts on rear motor mounts. Tighten all motor mount nuts to 2.9 - 3.6 kg-m or 21 - 26 ft-lb.

Fig. 4-172



0725-066

4. Tip snowmobile upright. Install the impulse line on the crankcase fitting.

5. Connect the electrical connector to the engine connector plug.

6. Install the carburetor. Tighten the carburetor clamp.

7. Install the four nuts and washers that secure the exhaust manifold in place.

8. Install the drive belt; then secure clutch guard.

9. Connect the headlight wiring harness.

10. Install the recoil starter bolts. Pull out recoil about 6 inches and tighten bolts to 0.69 kg-m or 5 ft-lb.

NOTE: Just before recoil bolts are tightened, pull the recoil so the starter pawls are engaged. This will correctly center the recoil, then tighten bolts.

Install Lynx Engine

1. Set the motor plate on the engine crankcase and bolt in place. Tighten cap screws to 7.6 kg-m or 55 ft-lb.

2. Guide rear motor mount bracket into position on the mount holes in front end; then set engine onto front motor mounts and install cap screws.

NOTE: Be sure to install any shims which were removed during disassembly. Also be sure that exhaust system bracket is in place.

3. Tighten all motor mount cap screws.

4. Install the impulse line on the crankcase fitting.

5. Connect the main wiring harness connector to the engine connector plug.

6. Install the carburetor. Tighten the carburetor clamp.

   Install the nuts and washers that secure the exhaust manifold in place.

8. Install the drive clutch. Tighten the drive clutch bolt to 6.22 kg-m or 55 - 60 ft-lb.

9. Install the drive belt; then install the belt shield.

10. Connect the headlight wiring harness; then install the hood and secure with two push pins and nuts.

11. Install the recoil starter bolts. Pull out recoil to engage starter pawls and tighten bolts to 0.69 kg-m or 5 ft-lb.

■ **NOTE: Just before recoil bolts are tightened, pull the recoil so the starter pawls are engaged. This will correctly center the recoil; then tighten bolts.**

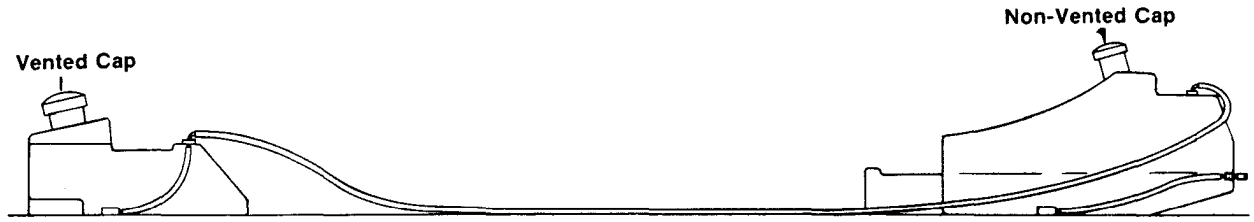
SECTION 5 — FUEL SYSTEM

TABLE OF CONTENTS

Pre-Maintenance Checks

1. Remove the fuel tank cap, ensure vent hole is not plugged. On models with two tanks, the rear tank is equipped with the vented cap; the front tank uses a sealed cap. If the hole is plugged, remove the obstruction by washing the cap.

Fig. 5-1 PANTERA FA (Dual Tanks)



2. Remove the in-line fuel filter; then plug the fuel line. If the filter is dirty, either backflush or replace the filter.

3. Remove the plug from the fuel line; then install a new or clean filter.

4. Check the fuel lines to ensure that all lines are correctly connected. If any cracks are evident in the lines, replace the lines.

5. Check the impulse line for correct connection on both the fuel pump and crankcase fitting.

Carburetor

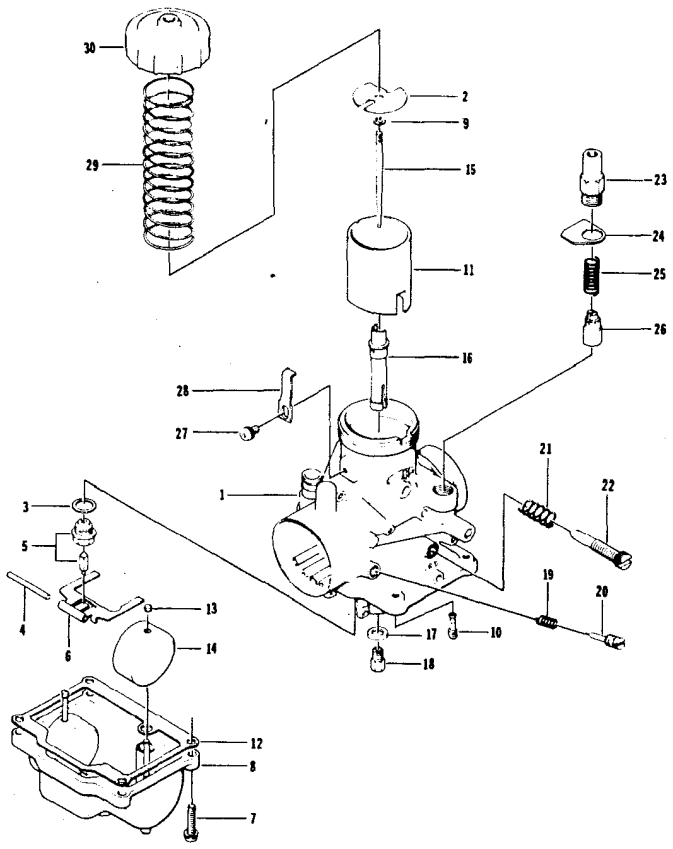
The 1978 Arctic Cat snowmobiles are equipped with Mikuni VM series carburetors. These float-type carburetors are equipped with both a low speed (pilot) system and a high speed (main) system. The carburetors are designed to provide efficient operation from idle to wide open throttle (WOT). The primary function of the carburetor is to meter a precise volume of fuel to be mixed with air, resulting in a volatile gas that can be ignited by the spark plug.

The adjustments for the Mikuni carburetor can be divided into two basic categories: external and internal adjustments. The external adjustments can be made with the carburetor on the snowmobile. The internal adjustments will require the removal of the carburetor and carburetor disassembly.

Specifications

	Pantera FC	Pantera FA	Panther 4000	Pan/Che 5000	Jag 2000	Jag 3000	Lynx 2000T	Lynx 2000S
Carburetor	VM-34	VM-32	VM-34	VM-34	VM-30	VM-30	VM-30	VM-30
Number of Carburetors	1	2	1	1	1	1	1	1
Main Jet	300	350	270	280	180	210	160	160
Pilot Jet	22.5	30	30	25	20	25	20	20
Jet Needle	6DH4-4	6DH7-4	6DH4-3	6DH8-2	5DP7-3	5DP7-3	5DP7-3	5DP7-3
Cutaway	3.0	3.5	2.5	3.0	2.0	2.5	2.0	2.0
Inlet Seat	1.5	1.2	1.5	1.5	1.5	1.5	1.5	1.5
Air Screw	1-1/2	1	3/4	1-1/4	1-1/2	1-1/2	1-1/2	1-1/2

Fig. 5-2 LYNX, JAG, PANTERA FC



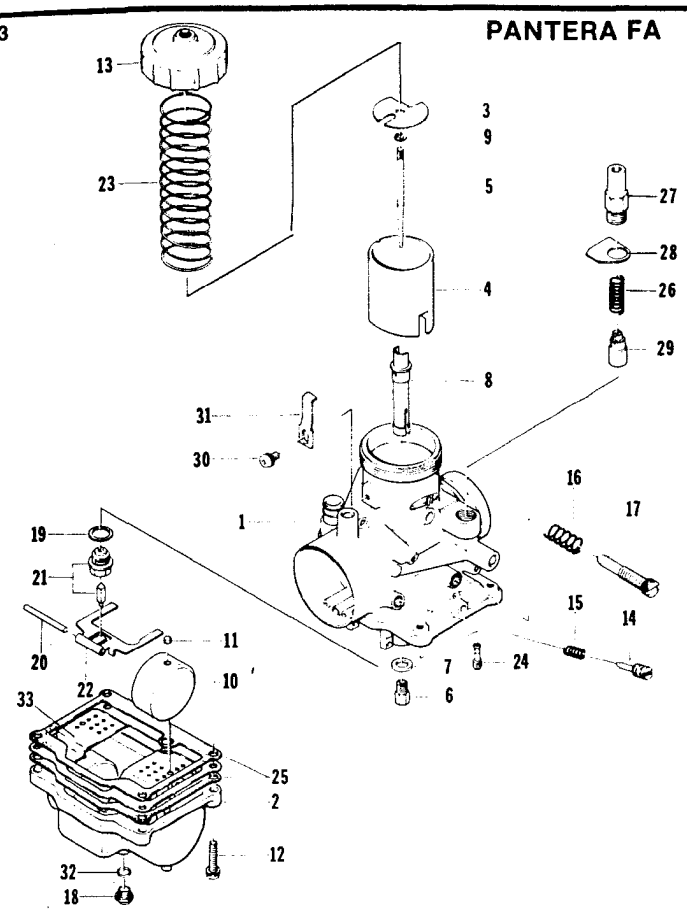
KEY

1. Mixing Body
2. Plate
3. Valve Seat Washer
4. Float Pin
5. Needle Valve Assembly
6. Float Arm
7. Machine Screw
8. Body/Float Chamber
9. Spring Clip
10. Pilot Jet
11. Piston Valve
12. Gasket
13. Cap
14. Float
15. Jet Needle
16. Needle Jet
17. Main Jet Washer
18. Main Jet
19. Air Screw Spring
20. Air Screw
21. Spring
22. Throttle Stop Screw
23. Plunger Cap
24. Lock Washer
25. Plunger Spring
26. Starter Plunger
27. Machine Screw
28. Plate
29. Piston Valve Spring
30. Chamber Top

0700-023

Fig. 5-3

PANTERA FA



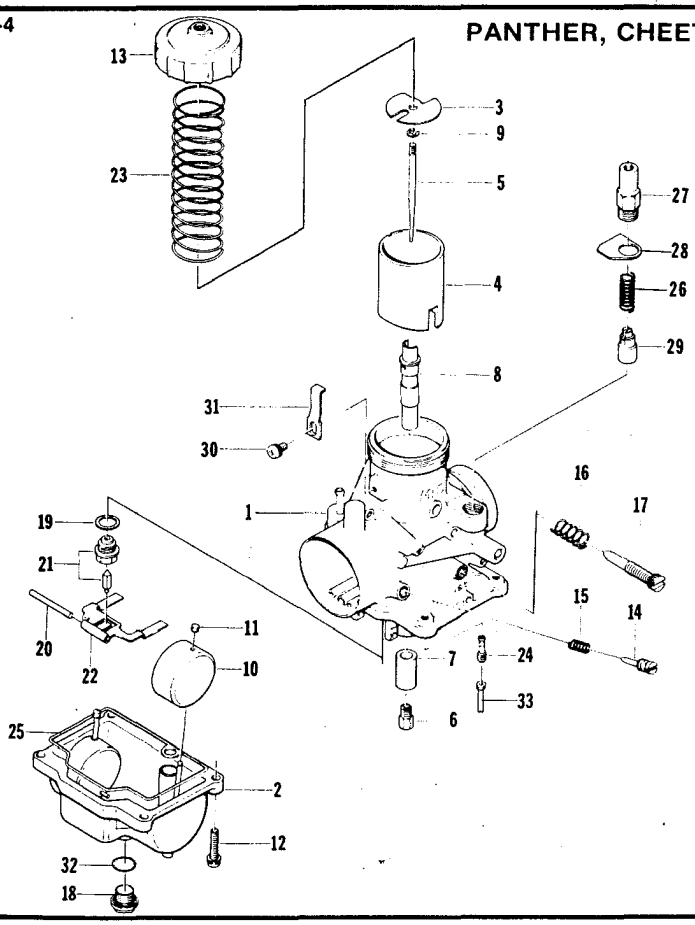
KEY

1. Mixing Body
2. Float Chamber
3. Plate
4. Piston Valve
5. Jet Needle
6. Main Jet
7. Washer
8. Needle Jet
9. E-ring
10. Float
11. Cap
12. Screw
13. Mixing Body Top
14. Pilot Air Screw
15. Pilot Air Spring
16. Throttle Stop Spring
17. Throttle Stop Screw
18. Drain Screw
19. Washer
20. Float Pin
21. Needle Valve Assembly
22. Float Arm
23. Piston Valve Spring
24. Pilot Jet
25. Gasket
26. Starter Plunger Spring
27. Starter Plunger Cap
28. Washer
29. Starter Plunger
30. Screw
31. Plate
32. O-ring
33. Baffle Plate

0700-026

Fig. 5-4

PANTHER, CHEETAH



KEY

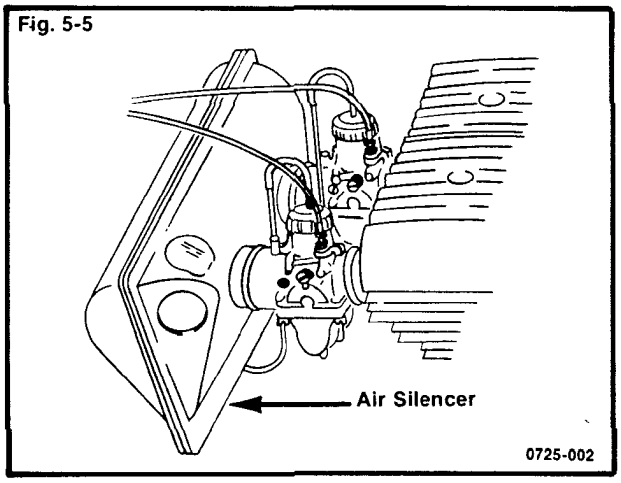
1. Mixing Body Assembly
2. Float Chamber
3. Plate
4. Piston Valve
5. Jet Needle
6. Main Jet
7. Sleeve
8. Needle Jet
9. E-ring
10. Float
11. Cap
12. Screw
13. Mixing Body Top
14. Air Screw
15. Air Screw Spring
16. Throttle Stop Spring
17. Throttle Stop Screw
18. Drain Screw
19. Washer
20. Float Pin
21. Needle Valve Assembly
22. Float Arm
23. Spring
24. Pilot Jet
25. O-ring
26. Plunger Spring
27. Plunger Cap
28. Washer
29. Starter Plunger
30. Screw
31. Plate
32. O-ring
33. Guide Screw

0700-038

Remove Carburetor

1. Remove air silencer (Pantera FA shown).

Fig. 5-5



2. Remove the fuel line from the carburetor fuel inlet fitting. Plug the line.

3. Loosen the mixing chamber locking plate screw; then rotate the mixing chamber top counterclockwise until the top, with the attached cable and throttle valve assembly, can be lifted free of the carburetor body.

4. Loosen the carburetor flange clamp; then slide carburetor free of flange.

5. Loosen the large brass colored choke adjuster until choke and cable assembly is free of carburetor.

6. Remove carburetor.

7. Carefully drain fuel from carburetor.

⚠ WARNING ⚠

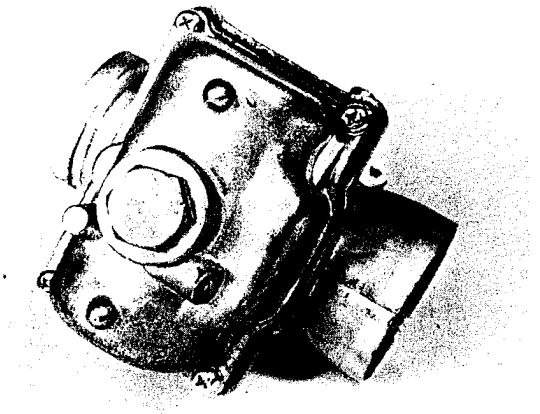
Whenever working on any component of the fuel system, keep away from any sparks or open flames. Do not allow smoking in any area of the shop.

Carburetor Disassembly

Basic carburetor disassembly is similar for all Mikuni carburetors. For reference in disassembly, use Fig. 5-2 to 5-4.

1. Remove the four screws holding float bowl in position; then lift off float bowl.

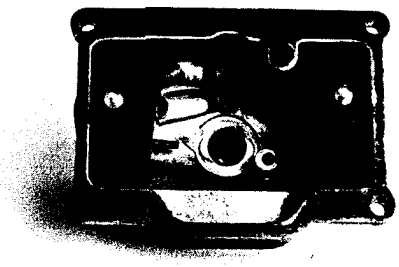
Fig. 5-6



A108

2. Remove the float pin caps. Pull floats off pins.

Fig. 5-7



A106

3. Remove float arm by pushing float pin through float pin towers.

NOTE: The float pin is flanged on one end and can be removed from only one side. The float pin can be installed one way only.

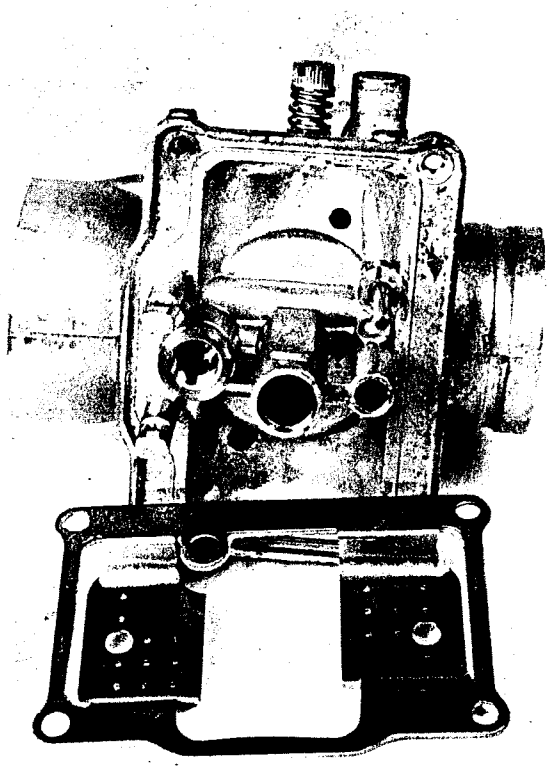
4. Remove the inlet needle valve, seat and fiber washer.

5. Remove the main jet and main jet washer.

NOTE: On Panther and Cheetah models it will be necessary to remove the main jet sleeve.

6. Remove the baffle plate and gaskets on the Pantera F A models. On all other models, remove the float bowl gasket.

Fig. 5-8



A110

7. Tip top of carburetor into cupped hand. Needle jet should slide into hand.

8. Remove the screw guide (Panther and Cheetah models only). Remove the pilot jet from the pilot tube.

9. Remove throttle stop screw and spring from side of carburetor.

10. Remove the air screw and spring.

11. Remove mixing chamber locking plate and screw.

Carburetor Cleaning

1. Wash all metallic carburetor parts with a good quality carburetor cleaner. DO NOT place any of the non-ferrous parts in carburetor cleaner because damage or deterioration will result.

2. After all parts have been washed, place the parts in a basket and submerse in carburetor cleaner.

3. Soak the parts for about 30 minutes; then rinse with fresh carburetor cleaner.

4. Dry the components with compressed air only, making sure all holes, orifices and channels are unobstructed.

● CAUTION ●

DO NOT use wire or small drill bits to clean carburetor orifices, holes or channels. Distorted or damaged orifices, holes or channels will result in poor carburetor operation.

Inspection

NOTE: Whenever a part is worn excessively, cracked, defective or damaged in any way, replacement is necessary.

1. Examine the carburetor body, float bowl and mixing chamber cap for cracks, nicks, stripped threads and any other imperfections in the casting.
2. Examine the throttle valve for imperfections in casting or "score" marks on slide surfaces.
3. Check condition of the throttle return spring.
4. Inspect floats for holes or damage.
5. Inspect all gaskets and O-rings for distortion, tears or noticeable damage.
6. Inspect jet needle and air screw for damaged tips.
7. Inspect tip of inlet needle valve.
8. Inspect starter plunger and seat for wear or damage.
9. Check carburetor insulator block for distortion by placing it on a surface plate. If only slightly distorted, sand it flat. If excessively distorted, replace the block.
10. Check carburetor mounting flange. If the flange is warped, replace the flange.

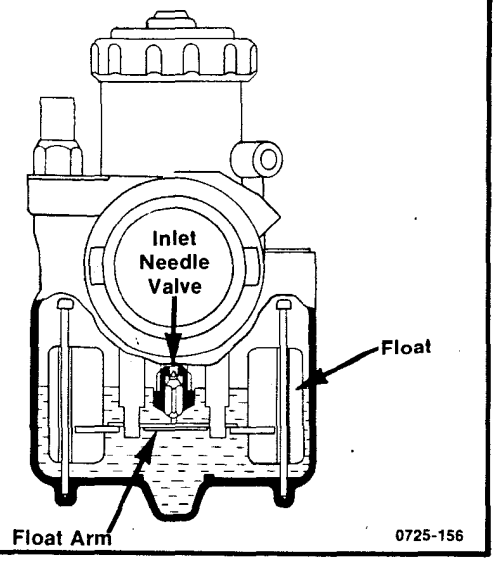
● CAUTION ●

An air leak between the carburetor and engine will cause severe engine damage.

Internal Adjustments

The fuel level in the float chamber is controlled by th rojection of the two float arms. If there is dirt b een the needle valve and seat, causing the valve to stay open, fuel will overflow. Also, wear or damage in the needle valve area, or a damaged float, will cause the fuel to overflow.

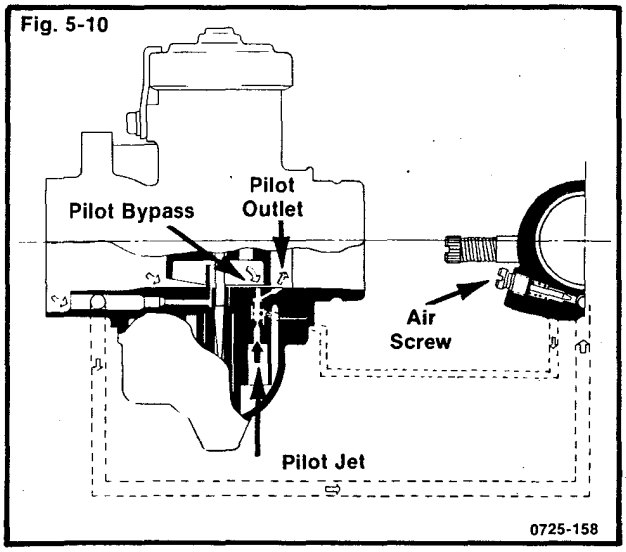
Fig. 5-9



Pilot Jet and Air Screw

The pilot jet circuit controls the incoming fuel mixture when the throttle valve is from 0 to 1/8 open. The amount of gasoline contained in the low speed mixture is metered by the pilot jet. The air is controlled by the air screw.

Fig. 5-10



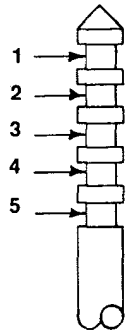
A larger numbered pilot jet will allow more fuel (richer) while a smaller number will provide less fuel (leaner).

Adjustment of the air screw is done with the engine idling. The screw is adjusted until the engine runs smoothly. Generally, the adjustment should range from 1 to 2-1/2 turns from a seated position. If it takes less than one turn, the pilot jet is too small and should be replaced with a larger pilot jet. If it takes 2-1/2 turns or more, the pilot jet is too large and should be replaced with a smaller pilot jet.

Jet Needle

The needle can be set in one of five different positions by moving the needle clip to a different groove. Assume the grooves are numbered from 1 to 5 starting at the top. The number 5 groove gives the richest mixture while the number 1 position gives the leanest mixture.

Fig. 5-11



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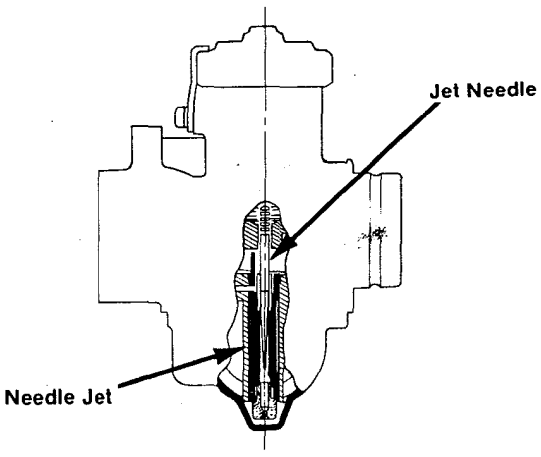
Needle Jet

Needle jets come in various sizes and work in direct relation with the jet needle. The needle jet orifice diameter remains constant through the entire length of the jet. Because of this, a change of the needle jet will have a greater effect than a groove change of the needle.

Fig. 5-12

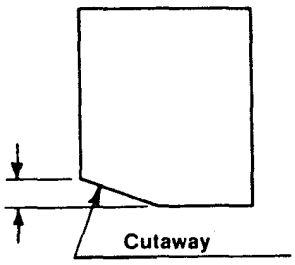


0725-157

Throttle Slide Cutaway

The amount of throttle slide cutaway affects the fuel/air mixture from 0 to 1/4 throttle slide movement. The throttle slides are numbered (1.5, 2.0, 2.5, 3.0, etc.); the number reflects the amount of cutaway. The larger the number, the greater the angle of throttle slide cutaway and the leaner the initial fuel/air mixture.

Fig. 5-13

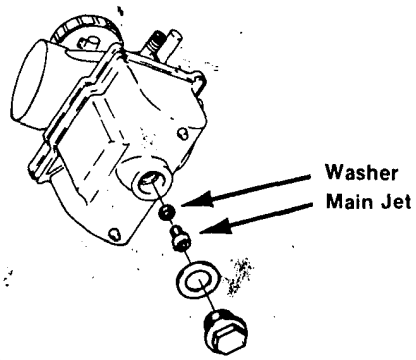


0725-265

Main Jet

Main jets for the carburetors have a graduated range in systematic steps of ten: 260, 270, 280, etc. The larger the number, the greater diameter of the jet orifice, and as a result, the richer the fuel/air mixture.

Fig. 5-14



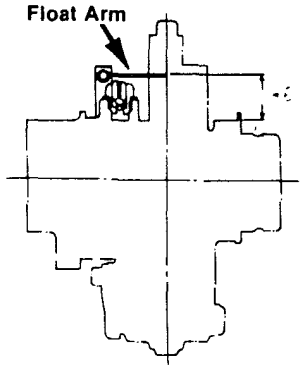
0725-301

Float Level

The carburetor float level is determined by the action of the floats against the float arm. The float arm has a small projection that controls opening of the inlet needle valve and allows fuel to flow into the float bowl. As the float level drops, the inlet needle opens until the fuel level is high enough to close the needle valve.

To check the float level, hold the carburetor upside down. Examine the distance between the gasket mating surface and the top edge of the float arm. The float arm must be parallel to the gasket surface.

Fig. 5-15



0725-269

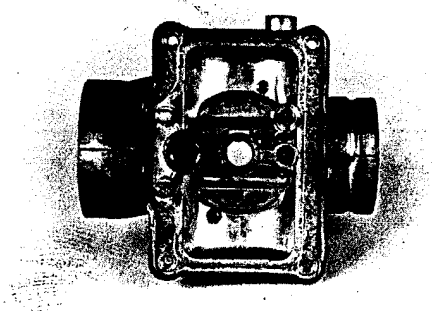
On the Panther and Cheetah models, the float bowl internals are slightly angled to account for the mounting position of the carburetor. For these models, the float arm must be positioned perpendicular to the inlet needle valve.

Carburetor Assembly

To aid in carburetor assembly, refer to figures on pages 68 and 69.

1. Install the pilot jet in the pilot jet tube. On the Panther and Cheetah models, install the screw guide also in the pilot jet tube.

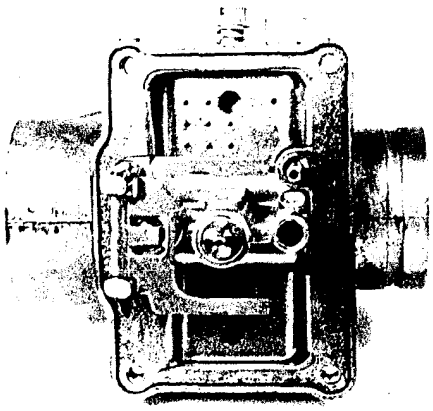
Fig. 5-16



A107

2. Place the needle jet in position by inserting it through the mixing chamber.
3. Secure needle jet in position with the main jet and washer or, on Panther and Cheetah models, with the main jet and main jet sleeve.
4. Install needle valve seat and fiber washer; then install inlet needle valve. If the model is so equipped, install gasket and baffle plate on carburetor.
5. Secure float arm with float pin by inserting pin through float arm towers.

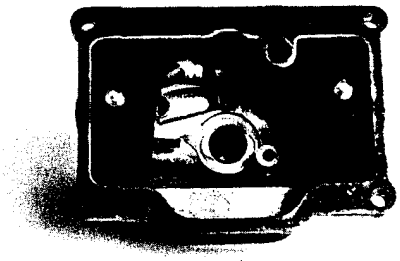
Fig. 5-17



A109

6. Check the float level (See: Float Level, page 73). If an adjustment is necessary, bend only colored adjuster. Bend locking tab.
7. Slide floats over pins in float bowl. Push pin caps onto pins to prevent floats from sliding off.

Fig. 5-18



A106

NOTE: The side marked "up" must be correctly positioned for proper carburetor operation.

8. Place float bowl gasket in position.

NOTE: Make sure holes in gasket align with holes in the casting.

9. Secure float bowl in position with four screws and tighten securely.

10. Install throttle stop screw and spring.

11. Install air screw and spring. Carefully rotate the air screw inward until lightly "seated".

12. Refer to the carburetor specifications chart and rotate the air screw outward the number of turns according to your model.

13. Install the mixing chamber locking plate and screw. DO NOT tighten until the carburetor cable/slide assembly is installed.

Install Carburetor

1. Insert the choke cable assembly in the carburetor and tighten the large brass colored adjuster. Bend locking tab.

2. Before installing throttle valve/cable assembly, check the position of the jet needle clip. The needle can be set in one of five positions by moving the needle clip to a different groove, refer to figure 5-11. The number 5 position (groove) gives the richest setting; number 1 the leanest. For fine tuning, the needle position can be changed to vary the incoming fuel mixture. The standard needle position is determined by the jet needle listing in the specifications. For example, on a 5DP7-3 needle, the clip position is determined by the last number (in this case the third position or groove).

3. Guide throttle valve and throttle cable into mixing chamber bore. Align full-length groove in throttle valve with alignment pin inside mixing chamber bore; then slide assembly into carburetor.

4. Tighten the locking plate screw.

5. If the carburetor flange and insulator block were removed, install them at this time. Be sure to apply a thin coat of RTV sealer to both sides of the insulator block.

6. Slide the carburetor into the carburetor flange.

7. Slide air silencer onto the carburetor.

8. When air silencer and carburetor are in place, tighten carburetor flange clamp and the air silencer clamp.

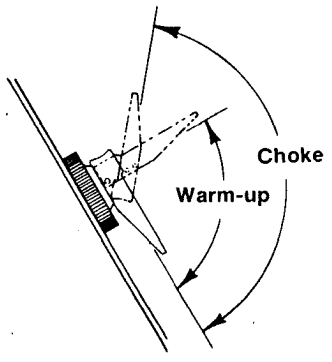
9. Remove the plug from the fuel line and install the line on the carburetor fuel inlet fitting.

External Adjustments

Choke

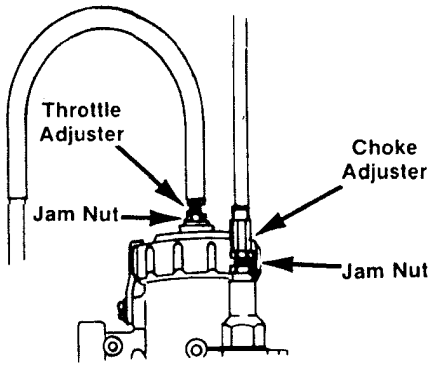
1. Move the choke lever to the CHOKE position and then to the WARM-UP position. Finally, move the lever to the OFF position. Since the choke has the three positions, the cable must be adjusted correctly.

Fig. 5-19



2. Rotate the choke cable adjuster to obtain 1/16-inch free play between the choke cable housing and the choke cable adjuster; then tighten jam nut.

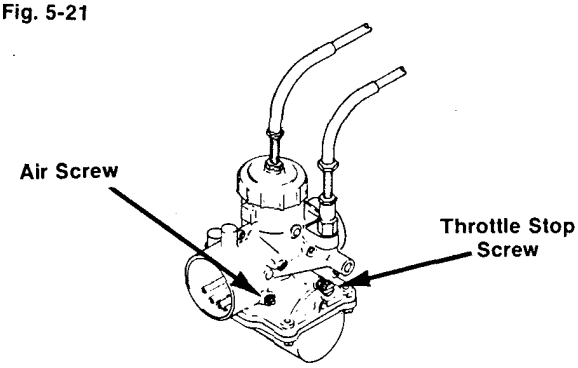
Fig. 5-20



Throttle Cable

1. Rotate the throttle stop screw counterclockwise until the retaining spring is fully extended.
2. Loosen the throttle cable jam nut.
3. Rotate the swivel adapter clockwise until a small amount of free-play is felt in the throttle cable.
4. Rotate the throttle stop screw clockwise until the retaining spring's coils bottom.
5. Now rotate the throttle stop screw 1-1/2 turns counterclockwise.

Fig. 5-21



6. Rotate the swivel adapter counterclockwise until all throttle cable slack is taken up. On models with two carburetors, repeat steps 1-6 on the remaining carburetor.

NOTE: On dual carburetor models, check the operation of the throttle slides. When the throttle lever is compressed, both slides must b : to rise at the same instant for correct carburetor synchronization. If throttle slide movement does not occur as specified, repeat steps 1-6.

7. Carefully rotate the air screw clockwise until the screw is slightly seated.

CAUTION

DO NOT force the air screw when rotating it clockwise. Forcing the screw will result in damage to the carburetor body.

8. Rotate the air screw counterclockwise the correct number of turns for the particular model. Refer to the specification chart.
9. With the snowmobile on a safety stand, start the engine and adjust the pilot air screw until engine idles smoothly at maximum rpm.

NOTE: If the engine does not start after the carburetor is adjusted, repeat steps 1-6 because throttle safety switch spring is not properly tensioned. Therefore, if all the throttle cable slack is not "taken up", the throttle safety switch will not allow the engine to start.

10. The idle speed may not be suitable for normal operation even though the carburetors are synchronized. Adjust the engine idle rpm as follows:

    A. Start the engine and run it until normal operating temperature is reached.

    B. If the engine will not idle or idles too slowly, rotate the throttle stop screw clockwise to get the desired idle rpm.

    C. If engine idle rpm is too high, rotate the throttle stop screw counterclockwise to reduce the engine rpm. It may be necessary to rotate the throttle cable adjuster inward to obtain adequate cable slack.

NOTE: On dual carburetor models, set both carburetors equally. If the screws are not adjusted equally, the throttle slides will not be synchronized; then steps 1-10 will have to be repeated.

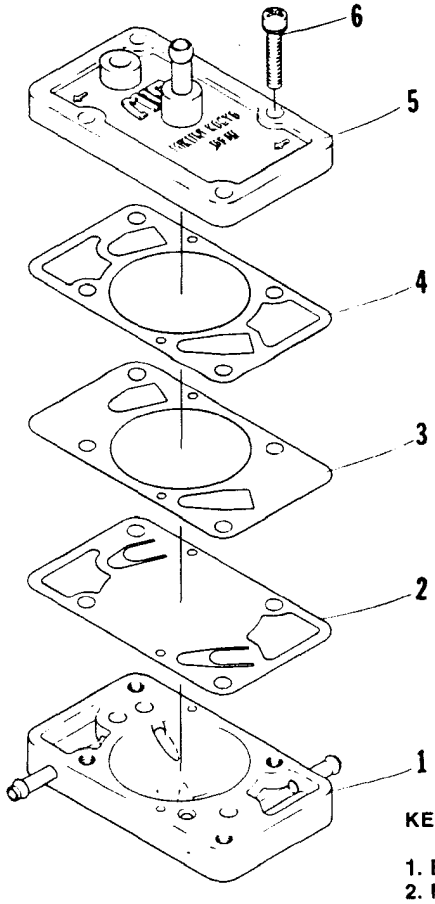
Fuel Pump

The 1978 Arctic Cat snowmobiles use a diaphragm-type fuel pump. The pump is actuated by secondary or crankcase compression. A rubber hose connects to the impulse fitting of both the fuel pump and engine crankcase.

On the 1978 snowmobiles, three different fuel pumps are used. Refer to the proper instructions for fuel pump repair.

FUEL PUMP	
Model	**Part No.**
Lynx	0109-887
Jag	0109-887
Panther	0109-875
Cheetah	0109-875
Pantera FA	0109-780
Pantera FC	0109-875

Fig. 5-22



KEY

1. Bottom Body
2. Membrane
3. Diaphragm
4. Gasket
5. Top Body
6. Screw

0700-114

Fuel Pump Disassembly

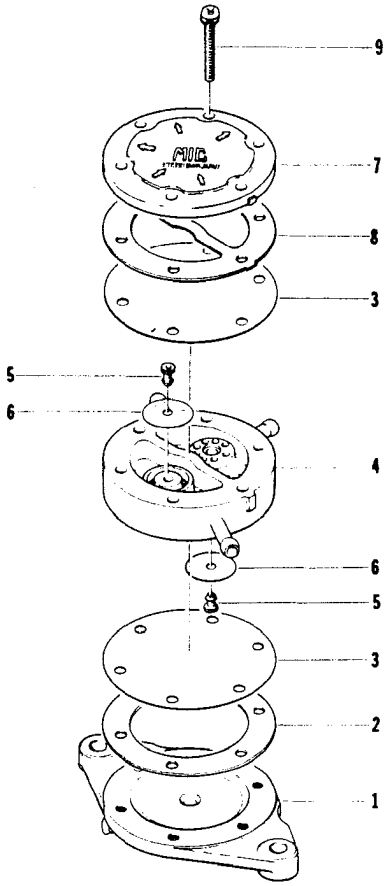
0109-887

1. Scribe a line across fuel pump components to aid in assembly.
2. Remove the four screws securing pump together.
3. Remove the top body from the fuel pump.
4. Carefully lift the gasket, diaphragm and membrane off the bottom body.
5. Separate the gasket, diaphragm and membrane.

0109-780, 0109-875

1. Scribe a line across fuel pump components to aid in assembly.
2. Remove the six screws holding the fuel pump together.
3. Lift the top cap off the fuel pump. Remove gasket and diaphragm.
4. Lift the top body off bottom body. Remove diaphragm and gasket.
5. Remove valves from fuel pump plate by pushing rubber grommets through from the side opposite valve. Valves can then be slipped off grommets.

Fig. 5-23



KEY

1. Body Bottom
2. Packing
3. Diaphragm
4. Top Body
5. Grommet
6. Valve
7. Cap
8. Packing
9. Screw

0700-055

Inspect Fuel Pump

1. Make sure all fuel pump parts are clean.
2. Inspect fuel pump diaphragms for holes or cracks.
3. Inspect fuel pump valves for cracks or distortion.
4. Make sure fuel and impulse fittings are tight.

Assemble Fuel Pump

0109-887

1. Place the membrane on the bottom body making sure the holes and membrane flappers are correctly positioned on the bottom body.
2. Place the diaphragm on the membrane. Make sure all holes align.
3. Place gasket on diaphragm. Holes must align.
4. Place the top body on the fuel pump.

NOTE: Use the scribe marks to aid in assembly.

5. Install the four screws which secure fuel pump components in position.

0109-780, 0109-875

1. Place bottom body on a clean surface.
2. In sequence, place gasket and impulse diaphragm on the bottom body.
3. Push fuel pump valves onto grommets.
4. Push fuel pump valves w/grommets into fuel pump plate.

NOTE: Valves w/grommets must be installed so they seat against machined surface of fuel pump top body.

5. Place top body on bottom body. Divided portion of top body must face upward.

NOTE: Use scribe marks to aid in assembly.

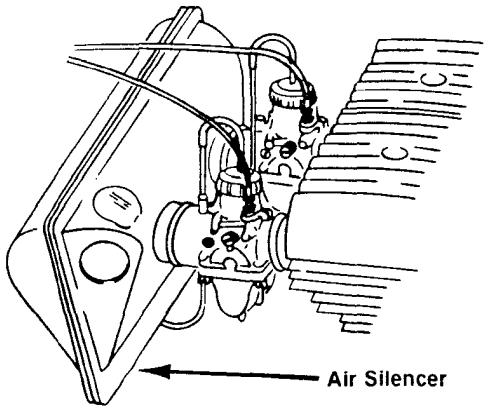
6. In sequence, place fuel pump diaphragm and gasket on top body.

NOTE: Be sure extruded edge of gasket is aligned with alignment tab on fuel pump plate. If gasket is installed improperly, extruded edge will not align with marks.

7. Place fuel pump cap on top body. Align marks on casting with top gasket.

8. Secure the fuel pump components with six screws and lock washers.

Fig. 5-24



Air Intake Silencer

General

The air intake silencer used on the 1978 Arctic Cat snowmobiles (most models) is a specially designed component used to silence the incoming fresh air and also to catch the fuel that "spits back" out of the carburetors. The carburetor is calibrated with the air intake silencer; thus, the engine must never be run with the air silencer removed.

Inspection

Since the air silencer is only available as an assembled component, no attempt should be made to disassemble it. If a problem with the silencer is suspected, there are a few checks that can be made.

1. With the silencer removed, check for holes or cracks in the silencer. If a defect is found, replace the silencer.

2. Shake the silencer to check for any loose baffles or silencer internals. There must be no loose components.

3. Periodically clean the intake silencer by blowing fresh air through both the silencer and air intake hose.

● CAUTION ●

On models equipped with a silencer, the air intake silencer must be secured to the carburetor whenever the engine is run or when the carburetor is being adjusted. If the silencer is removed and the engine is run, poor performance will result. Therefore, DO NOT run the engine when the intake silencer is removed from the carburetor.

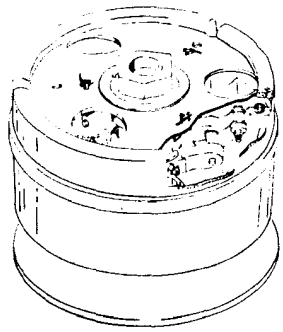
SECTION 6 — DRIVE SYSTEM

TABLE OF CONTENTS

Drive Clutch Theory

The Arctic drive clutch has three variable components — the spring, ramps and the weights. All work together to provide the specific engagement speed and shifting characteristics of the clutch.

Fig. 6-1



0725-060

General

The quick change characteristics of the Arctic hexagonal shaft drive clutch make it particularly well suited for adjustment. Only three socket head cap screws hold the cover plate in place. Removal of these and the cover plate allows easy access to all internal components. Ramps can be easily changed with a hex key wrench. An easy-to-remove nut and bolt hold the round weights in place at the ends of the spider arms. The large spring space inside the housing allows for flexibility in spring design and size.

Spring Chart

Spring

The primary function of the spring is to control engagement speed. At idle, the spring keeps the clutch sheaves apart. However, as the throttle is opened and engine rpm increases, centrifugal force eventually overcomes the force of the spring and the rollers and weights on the spider arms move outward on the three ramps. This brings the moveable sheave toward the stationary sheave, and, when the moveable sheave begins to squeeze the drive belt between itself and the stationary sheave, drive clutch engagement takes place. Therefore, drive clutch engagement speed is increased or decreased depending on the spring rate. A light spring allows the clutch to engage sooner (lower rpm) than a heavy spring. The chart below provides the specifications of the springs used by Arctic Enterprises.

	Part No.	Spring Rate (lb/in.)	Spring Comp. (@ 1.25 in.)	Spring Length (No Load)	No. Coils	Color Code
LIGHT	0146-065	22.5 - 27.5	67.5 - 87.5 lb	4.35 in. + 0.25	5.1	White
↕	0146-313	43	70 - 84 lb*	4.00 in. + 0.100	5.15	Red
↕	0146-067	45 - 53	145 - 165 lb	4.35 in. + 0.187	5.35	Yellow
↕	0146-005	54 - 62	170 - 190 lb	4.34 in. + 0.156	5.2	Unpainted
HEAVY	0146-068	60 - 66	123 - 137 lb*	4.35 in. + 0.156	5.0	Green

*at 2.187 in.

Weight Chart

Part Number	Weight in Grams	Outside Diameter	Color Code
0146-227	1.000	.400"	Aluminum
0146-225	1.500	.463"	Aluminum
0146-226	2.000	.521"	Aluminum
0146-159	2.500	.377"	White
0146-108	3.058	.406"	Yellow
0146-175	3.725	.437"	Red
0146-135	4.479	.471"	Black
0146-379	4.577	.473"	Black
0146-176	4.675	.500"	Green
0146-107	4.958	.491"	White
0146-279	5.457	.511"	Black
0146-106	5.958	.530"	Red
0146-278	6.475	.549"	Black
0146-123	6.992	.568"	Yellow
146-105	7.858	.598"	Black
0146-286	8.800	.629"	Red
0146-136	9.279	.644"	Green
0146-104	9.750	.665"	White
0146-166	10.600	.684"	Red
0146-307	11.300	.703"	Yellow
0146-314	12.000	.723"	Green
0146-345	15.000	.798"	White
0146-308	18.000	.873"	Black

Weights

Each arm of the spider assembly has two weights, a roller and a bushing secured to the arm by a small bolt and lock nut. The weights provide an outward centrifugal force which causes the rollers to move up the ramps. As engine rpm is increased, outward centrifugal force becomes strong enough to overcome the force of the spring and causes the moveable sheave to push the drive belt against the stationary sheave. By increasing the weight, the centrifugal force generated is greater and the drive clutch will "shift up" at lower rpm. Conversely, by installing lighter weights, the generated centrifugal force is less and the clutch takes longer (higher rpm range) to "shift up".

Arctic weights are available from one gram to over 18 grams.

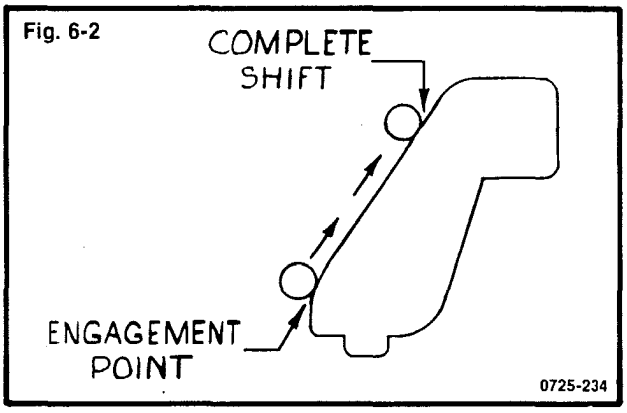
Ramps

Drive clutch ramps affect the overall shift pattern of the drive clutch. Ramps that are properly matched for a given engine allow smooth engagement and maintain maximum horsepower through the rpm range of the shift pattern.

The design of the ramp is dependent on the torque curve of the engine. A high rpm racing engine uses a ramp profile that is much different than that of a low rpm, "family" sled.

The total distance of the rollers on the ramps for the complete shift from engagement through "top end", where the drive clutch is in a 1:1 relationship with the driven clutch, is only about 1 inch. Considering this, it is easy to see why a thorough understanding of the close relationship between ramp profile and shift characteristics is necessary before any changes are made.

Fig. 6-2



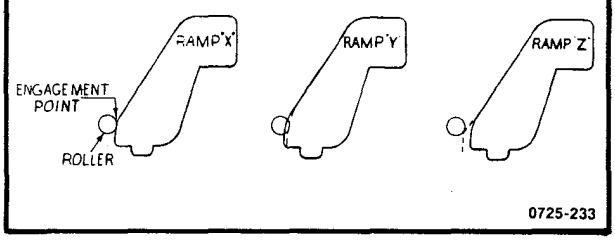
Ramp Profile and Shift Characteristics

As previously stated, the Arctic drive clutch has three major variables which are closely related and which greatly affect the overall power transfer efficiency of the snowmobile. These variables, the spring, the weights and the ramp profile, are matched at the factory for each different snowmobile model and engine size. The factory set-up provides optimum power transfer efficiency for average customer usage. However, by understanding these clutching variables, the Arctic drive clutch can be customized to suit almost any individual performance requirement.

From the discussion on the spring, we know that the engagement speed can be changed by either increasing or decreasing the spring rate. Also affecting engagement speed, as well as determining the characteristics of the overall shift pattern, is the profile of the ramps. The profile of the ramps will either increase or decrease the engagement speed (rpm).

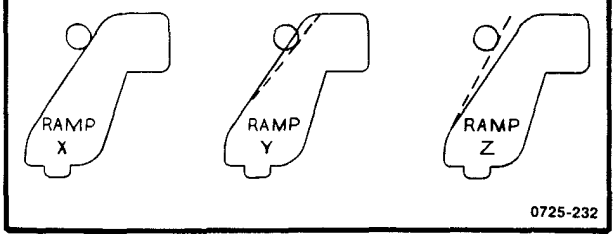
The illustration below shows how the engagement rpm can be changed by varying the ramp profile. For example, ramp "X" allows the clutch to engage at 3500 rpm. Notice the point at which the roller begins its travel up the angled incline of the ramp. On ramp "Y", the angle of incline at this point of engagement is steeper, making it necessary for the engine to develop higher rpm before the roller begins its climb up the ramp. Thus, the engagement speed with ramp "Y" would be more than 3500 rpm. On ramp "Z", the angle of incline at the point of engagement is less than it is on ramp "X". Thus, it will be easier for centrifugal force to cause the roller to move up ramp "Z" and therefore, the clutch will engage at less than 3500 rpm.

Fig. 6-3



Shown below are three different ramp profiles and the position of the roller when the clutch has completed its shift pattern. Note the three different angles of incline. For example, the engine is running at 6500 rpm when the drive clutch, with ramp "X", has full shifted. On ramp "Y", the profile is cut back (less angle of incline) toward the top. It is easier for centrifugal force to move the roller up ramp "Y" and the engine speed required is less than 6500 rpm. On the other hand, ramp "Z" is not cut back as far as ramp "X". The engine will have to run at a speed greater than 6500 rpm to move the roller to the top of the ramp against spring pressure and complete the shift pattern.

Fig. 6-4



NOTE: The only change made in these examples was to the ramp profile. The spring rate and the weights were left constant.

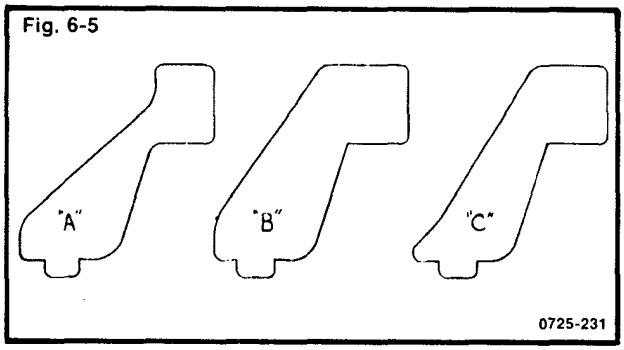
Ramps are designed to match the shifting characteristics of the drive clutch to the torque and horsepower curves of the engine. Thus, with several different types of engines used in snowmobiles, ramp profiles vary accordingly.

The illustration below shows three different ramps. Ramp "A" was made for an engine that develops maximum horsepower at low rpm (approximately 6000). With its relatively shallow angle of incline, this ramp allows the clutch to shift through its pattern faster, pulling the rpm of the engine down. Such a ramp would not work on a high rpm race engine.

Ramp "B" was made specifically for a high rpm race engine. The relatively steep angle of incline causes high rpm engagement and high rpm throughout the pattern. This is exactly what a race engine requires as it has very little torque and needs a high engagement speed.

Ramp "C", on the other hand, was designed for a high rpm engine that requires a low rpm engagement. After the low rpm engagement, the ramp incline increases, causing the engine to run through the balance of its shift pattern at high rpm.

Fig. 6-5



Driven Clutch Theory

Operation

The driven clutch is connected to the drive shaft and track of the machine through the chain case and drive chain. Its purpose is to sense the load on the machine and keep enough tension on the drive belt to keep from slipping. The driven clutch is a very important element in the drive system, and, unless it is doing its proper job, the machine will not perform up to its capabilities.

The Arctic driven clutch is the only element in the drive system that is torque sensing; that is, it can sense the load. It analyzes how much torque it is receiving from the engine, then compares this value with how much resistance it is receiving from the track and ground. It then shifts to the highest possible ratio, under the conditions, to obtain maximum speed and power.

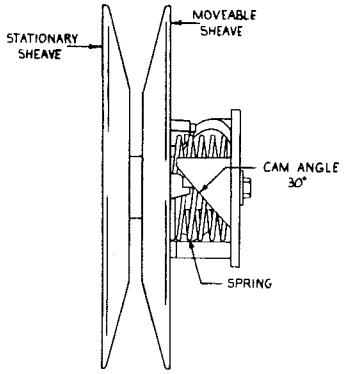
When the load (resistance) on the driven clutch is increased and becomes greater than the torque delivered from the engine, the driven clutch becomes dominant and overrides the drive clutch. The driven clutch "down-shifts" into a ratio that will supply the amount of torque needed for the increased load. Because the driven clutch can sense the load and shifts into the proper ratio, the engine rpm will remain at peak output. If the driven clutch did not "down-shift", it would stay in too high a ratio and the engine would run below its maximum power rpm.

The Arctic driven clutch has two variables that affect the proper shift pattern in the driven unit: spring tension and the angle of the cam.

Spring

The spring tension on the driven clutch determines the rpm that the engine will run at during the shift pattern. The Arctic driven clutch is made so that the spring tension can be adjusted. If the rpm of the engine is over the peak of the power curve, spring tension can be decreased. This allows the driven clutch to shift into a higher ratio, with the same amount of load on the track. Consequently, the rpm of the engine is pulled down. Conversely, when the driven clutch is shifting into a higher ratio than the engine has power to pull, the rpm of the engine will go below the peak of the power curve. By increasing the spring tension on the driven clutch, the clutch will not shift up under the same load but will stay in a lower ratio. This increases the engine rpm.

Fig. 6-6



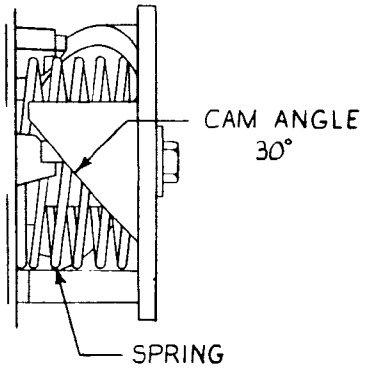
NOTE: Increasing driven clutch spring tension will increase engine rpm. Decreasing spring tension will decrease rpm.

By varying the amount of spring tension, the driven clutch can be matched to the drive system under vastly different load conditions. When the track has a very light load, like riding on a lake with little snow cover, the spring tension may be relaxed. For very heavy snow conditions, the spring tension may have to be increased to maintain the correct rpm. By having a driven clutch spring that can be easily adjusted, the engine speed can be varied a few hundred rpm higher or lower.

Cam Angle

The second variable in the driven clutch is the cam angle. This angle, along with the spring tension, controls how easily the driven clutch will shift up. If the spring tension remains the same and the cam angle is changed to a steeper angle, the clutch will shift to a higher ratio under the same load.

Fig. 6-7



This will lower the rpm of the engine. The reverse is true when going to a cam with less angle; the rpm of the engine will increase.

NOTE: A 30° cam angle will run more engine rpm and "shift up" slower than a 45° cam.

This variable is adjusted only at the factory and cannot be changed by the customer. Much dyno and field running has been done with cam angles of varying degrees. The cam angle that is used on the Arctic driven clutch has been proven to be the most responsive to a wide range of snow conditions.

Sprocket Ratio Theory

General

In the early days of the snowmobile, the only changes made to the drive system to increase performance were changes to the sprocket ratio. From that stage, manufacturers have moved ahead in understanding the complete drive system. The ways to change and improve the operation of the drive and driven clutches are much better understood now, and the performance gains we see today are mainly a result of modifications in these two areas.

Sprocket Changes Affect Clutching

The sprocket ratio on the machines today is chosen by the manufacturer after all the data for that machine is known. The horsepower curve, operating rpm, clutch ratio and sled weight are all used to calculate the sprocket ratio that will produce the best performance for that machine. Field testing in different snow conditions is then conducted to confirm the best sprocket ratio to use. After the sprocket ratio has been selected, the drive and driven clutches can then be matched to the snowmobile.

■ **NOTE: Any change in sprocket ratio will have an effect on the operating rpm of the clutches.**

Many people have the misconception that by increasing the sprocket ratio (example: from 17:39 to 19:39) the rpm of the engine will go down. The opposite is true on the Arctic drive system. From the discussion of the driven clutch, we said that when driven load (load on the track) is increased above torque delivered, the driven clutch becomes dominant and overrides the drive clutch, resulting in a back-shift while full rpm is maintained. This explains why the rpm will increase when the sprocket ratio is increased. By going to a large sprocket ratio, the driven clutch senses a heavier load from the track. If the driven clutch is dominant to the drive clutch, it will override the drive clutch and shift into a lower ratio. This will then increase the rpm of the engine.

Before improvements were made in the speed sensing ability of the driven clutch, a change to larger gear ratio did, in many cases, decrease the rpm of the engine. The reason for this was that the torque sensing driven clutch was not dominant to the drive clutch.

In the clutch systems of today, the brain of the drive system is the torque sensing driven clutch. The driven clutch knows what the load on the track is and reacts to that load by shifting into the clutch ratio the engine has power to handle without losing rpm.

Drive Belt Theory

The drive belt plays an important part in drive system performance. The belt dimensions and construction are two variables that influence the performance of the drive system. Drive belts have been vastly improved in the last few years. With the tremendous increase in horsepower, drive belts have been developed that far exceed original estimates of possible power ratings for a single belt drive system.

Drive Belt Dimensions

The drive belt dimensions are very closely calibrated when the drive system is matched to the machines at the factory. The two dimensions that are important to the performance of the machine are the O.C. (outside circumference) of the belt and width. Both of these dimensions will influence the shifting characteristics of the clutches.

DRIVE BELT SPECIFICATIONS					
		0227-007	0227-014	0227-019	0227-020
tside Circumference*	— cm — in.	109.8 43.25	115.6 45.5	109.8 43.25	118.6 46.7
Width**	— cm — in.	3.17 1.25	3.17 1.25	3.17 1.25	3.17 1.25
Thickness**	— cm — in.	1.35 0.53	1.35 0.53	1.35 0.53	1.35 0.53
Taper		+3 28° -2	+3 28° -2	+3 28° -2	+3 26° -2

*Specifications tolerance ± 0.5 cm or 0.19 in.
**Specification tolerance ± 0.16 cm or 0.062 in.

Drive Belts Not Within Specification

If the drive belt is longer than specifications allow, the performance will not be up to standard. The drive clutches will not have the full shift ratio. With a long drive belt, the low end ratio may be 2.75:1 instead of 3.79:1 as it should be. This will cause a bog on engagement and poor acceleration. Also, the top ratio may only be about 1.5:1. This will cause a loss in top speed.

A drive belt that is worn thin will produce the s e effect as one that is too long. New drive belt w. .n, measured across the outer edge, is 1-1/4 in. The belt has exceeded the minimum wear limit when it measures less than 1-1/16 in. The drive belt should then be replaced.

A belt that is shorter than specifications will cause a loss in performance. The clutches will have a different shift pattern because they are in different ratios than conditions for which they were originally matched.

Drive Belt Construction

The drive belt construction has an influence on the way the clutches will shift and on the amount of power that will be transmitted through the system. ONLY ARCTIC DRIVE BELTS SHOULD BE USED. A different brand of belt may not have the same construction, causing more friction when the belt is wedged between the sheaves. This will cause a loss in efficiency.

NOTE: A stiff belt causes more hp loss to the track. As a belt warms up, it gets more flexible and transmits power with less loss.

\ .r Characteristics

Normal Belt Life: In general, there is no specific time or mileage at which the drive belt suddenly wears out or fails. With proper maintenance and proper operation of the machine, a drive belt can last a full season.

If the drive belt fails after a very short time, there is some sort of malfunction in the drive system.

Drive System Components

DRIVE SYSTEM COMPONENTS			
	Part Number		
Model	Drive Clutch	Driven Clutch	Drive Belt
2000S Lynx	0225-099	0226-016	0227-007
2000T Lynx	0225-100	0226-016	0227-007
2000 Jag	0225-100	0226-016	0227-014
3000 Jag	0225-072	0226-016	0227-014
4000 Panther	0225-092	0226-019	0227-007
5000 Panther	0225-091	0226-019	0227-019
5000 Cheetah	0225-091	0226-019	0227-019
FC Pantera	0225-113	0226-016	0227-020
FA Pantera	0225-094	0226-016	0227-020

Drive Clutch

DRIVE CLUTCH SPECIFICATIONS							
Item	Drive Clutch						
	0225-072	0225-091	0225-092	0225-094	0225-099	0225-100	0225-113
Weight Part No.	0146-105	0146-286	0146-307	0146-105	0146-123	0146-104	0146-123
Spring Part No.	0146-067	0146-068	0146-313	0146-068	0146-067	0146-068	0146-068
Ramp Part No.	0146-290	0146-294	0146-290	0146-294	0146-294	0146-294	0146-362
Roller Part No.	0146-214	0146-355	0146-214	0146-355	0146-355	0146-355	0146-355
Engagement rpm	3200	3400	3300	3300	3200	3400	2600
Clutch Offset — mm — in.	11.5 0.454	11.5 0.454	11.5 0.454	11.5 0.454	11.5 0.454	11.5 0.454	11.5 0.454

Inspect and Measure Bearing for Wear

The maximum allowable bearing wear or clearance between the hex shaft and bearing is critical for correct drive clutch operation. The flats on the drive clutch are directly associated with the large bearing area. This bearing area, added to the high bearing load capacity and low coefficient of friction, results in improved life expectancy of the clutch.

For assembly purposes, radial clearance between the hex shaft and bearing is necessary, and a slightly greater clearance does not adversely affect clutch operation. However, the maximum allowable bearing wear tolerance is limited by the clearance between the ramp and inside surface of the roller arm.

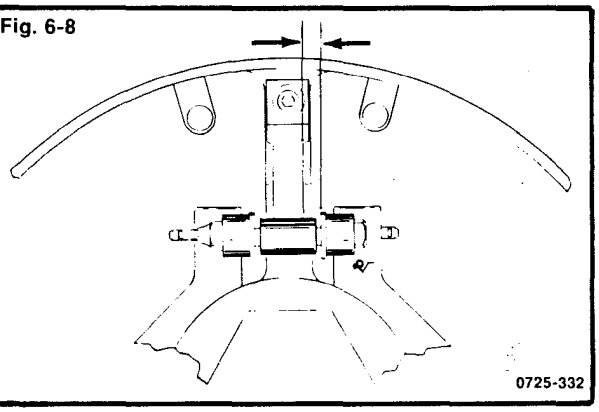
If the bearing is considered to be worn, roller arm and ramp clearance can be visually inspected by looking into the clutch, or the clutch can be removed from the crankshaft and measured. The visual inspection method and measurement method are explained below.

Visual Inspection Method

1. Look into the clutch and rotate it clockwise and counterclockwise; a flashlight may be necessary to see inside the clutch. Look at the inside surface of the roller arm; there must not be any contact between the roller arm and ramp, Fig. 6-8.

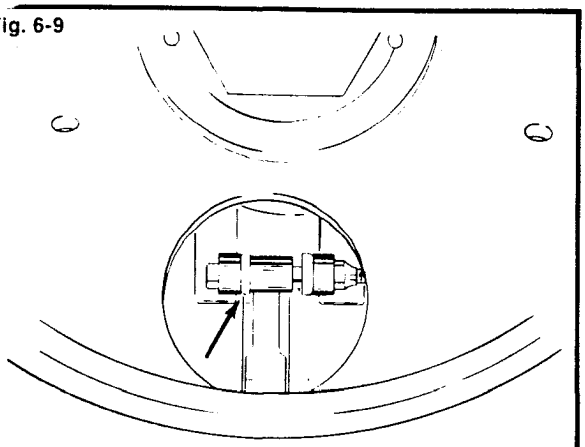
2. If there is no contact between the roller arm and ramp, Fig. 6-8, the maximum allowable drive clutch bearing wear is within tolerance. The drive clutch is acceptable.

Fig. 6-8



3. If there is contact between the roller arm and ramp, Fig. 6-9, the maximum allowable drive clutch bearing wear is not within tolerance. Drive clutch moveable sheave and cover must be replaced.

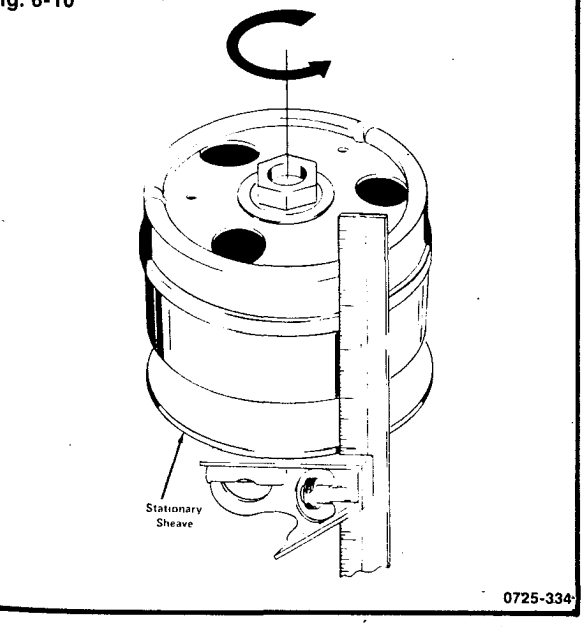
Fig. 6-9



Measurement Method

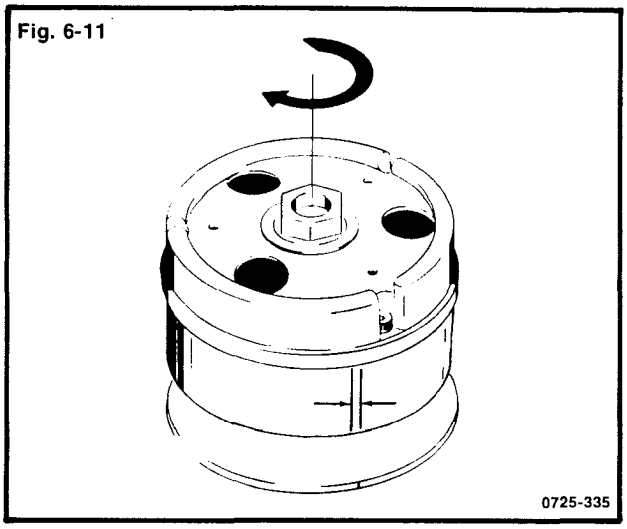
1. Remove the drive clutch from the crankshaft (See: Drive Clutch Removal).
2. Remove cover housing and spring (See: Disassemble Drive Clutch, page 89).
3. Install cover housing with three socket head cap screws, using a 1/4-inch wrench.
4. Keeping the stationary sheave fixed, rotate the moveable sheave counterclockwise until all clearance is taken up. Scribe a line on the moveable sheave, using a tri-square and scribe, Fig. 6-10.

Fig. 6-10



5. Keeping the stationary sheave fixed, rotate the moveable sheave clockwise until all clearance is taken up, Fig. 6-11. Scribe another line on the moveable sheave, using a tri-square and scribe, Fig. 6-11.
6. Measure the distance between the two scribe marks, Fig. 6-11, using a caliper or scale.
7. If distance between the two scribed lines is less than 4 mm (0.156"), the maximum allowable drive clutch bearing wear is within tolerance. Drive clutch is acceptable.
8. If distance between the two scribed lines is more than 4 mm (0.156"), the maximum allowable drive clutch bearing wear is not within tolerance. Drive clutch moveable sheave and cover housing must be replaced.

Fig. 6-11



Removal

1. Unlatch the clutch shield and tilt it upright.
2. Remove the drive belt.
3. Remove the bolt and lock washer securing the drive clutch on the crankshaft.

Fig. 6-12

4. Insert the special Arctic clutch puller bolt. Use either an impact wrench or a breaker bar and a chain wrench to tighten the puller bolt. If the clutch will not release, sharply strike the head of the puller bolt. If clutch does not come loose, tighten the puller bolt and again strike the bolt. Repeat until clutch becomes loose on shaft.

Disassembly

1. Remove the three hex socket head cap screws holding outer housing to the moveable sheave.
2. Remove the clutch spring; then remove the cupped washer.
3. Loosen the three jam nuts and the three set screws holding spider assembly on the hex shaft.
4. Push spider toward stationary face just far enough so the split ring is free.
5. Remove the split ring halves from the groove in the hex shaft.
6. Mark the spider in relation to the hex shaft; then remove spider.
7. Slide moveable sheave off hex shaft.
8. If the spider, rollers or weights are to be serviced, use the following procedure:
   a. Remove the lock nut and cap screw holding weights, roller and bushing to the roller arm.
   b. Slide roller with bushing from between roller arm.
   c. Perform steps a and b on remaining roller arms.

NOTE: A complete roller kit with bushings is to be installed, even if only 1 roller with bushings is worn or damaged. If new rollers with bushings are to be installed, new ramps are also to be installed.

9. Remove the hex socket head cap screws retaining the ramps to the moveable sheave. Slide ramp out of "ramp setting" in moveable sheave.

NOTE: A complete set of ramps is to be installed, even if only 1 ramp is worn or damaged. If the ramps are to be replaced, new rollers with bushings are also to be installed.

Cleaning

1. Wash grease, dirt and foreign matter off all parts, using cleaning solvent. Dry the parts with compressed air.
2. If drive belt accumulations are on the stationary sheave, or on moveable sheave duralon bushing, remove the accumulations using cleaning solvent only.

CAUTION

DO NOT use steel wool or a wire brush to clean parts having a duralon bushing; damage will result if bushing is contacted.

Inspection

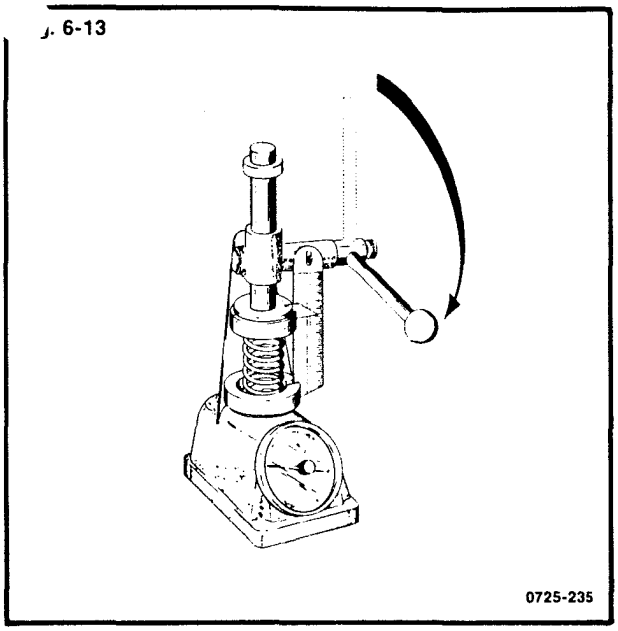
NOTE: Whenever a part is worn excessively, cracked, defective or damaged in any way, replacement is necessary.

1. Inspect stationary sheave, moveable sheave and cover housing for cracks and imperfections in casting.
2. Inspect the spider for cracks and imperfections in the casting. Arms, weights and rollers must be free of damage or wear.
3. Inspect the ramp settings on the inside of the moveable sheave for wears and cracks.
4. Inspect the spring for proper compression qualities (See: Spring Compression Test). If spring compression is not as specified or damage is evident, replacement is necessary.
5. Inspect the ramps for any uneven wear pattern.
6. Inspect all threaded areas for any stripped threads.
7. Inspect the hex shaft; no burrs or rough edges are to be evident. Use a fine file to remove any burrs or rough edges. Thoroughly clean and dry the hex shaft if any filing was done.

Spring Compression Test

The spring is to be a specific length and have definite pressure characteristics to ensure proper drive clutch engagement. Spring pressure reading must be as specified when checked with a spring pressure tester. If the pressure is within

tolerance and an engagement problem still exists, another part in the drive clutch is affecting engagement rpm. To find the correct pressure values, refer to the spring chart on page 81.



1. Place spring between compression pad and scale contact surface.

2. Push compression arm down 3.2 cm (1.25 inches); then read the number of pounds registered on the indicator. Indicator reading is to be as specified. If reading is less than specified spring pressure, install a new spring.

Assembly

1. Install the ramps in the moveable sheave. Tighten the three screws to 0.3 - 0.4 kg-m or 25 - 30 in.-lb.

NOTE: Ramps must be replaced as a set even if only one is worn. Also, if new ramps are being installed, a new roller set with bushings must also be installed.

2. Slide the moveable sheave onto the stationary sheave. Make sure alignment marks on both sheaves are aligned.

3. If the spider, rollers or weights were serviced, assemble the spider assembly using the following procedure:

   a. Slide a bushing into a roller; then insert both parts between the roller arm. Make sure bushing "cut-outs" slide over the two small ears on the inside surface of the roller arm.

   b. Slide a weight onto the cap screw; then push cap screw through roller arm, roller and bushing.

NOTE: Head of cap screw must be positioned on side of roller arm having the two small ears.

   c. Slide another weight onto opposite end of cap screw; then install a lock nut. Tighten lock nut to 0.4 - 0.6 kg-m or 35 - 40 in.-lb.

   d. Perform steps a, b and c on remaining rollers, bushings and weights.

   e. Thread the three set screws with lock nuts into the spider.

4. Slide the spider assembly onto the hex shaft. Make sure marks made during disassembly are aligned. Side with stamped part number must face up.

5. Install the split ring halves in the groove on the hex shaft.

6. Pull the spider up against the split ring halves. Tighten the set screws to 0.4 - 0.6 kg-m or 35 - 40 in.-lb; then bottom the set screw jam nuts.

7. Slide the spring onto the hex shaft.

8. Place the cover housing on the spring and line up the alignment mark with those on the stationary and moveable sheaves.

9. Carefully push down on the cover housing and lift up on the moveable sheave until the parts contact; then install the three socket head cap screws. Be sure to use care when installing cover so that duralon bushing is not damaged. Tighten the cap screws to 2.07 - 2.35 kg-m or 15 - 17 ft-lb.

Installation

1. Place drive belt on driven pulley.

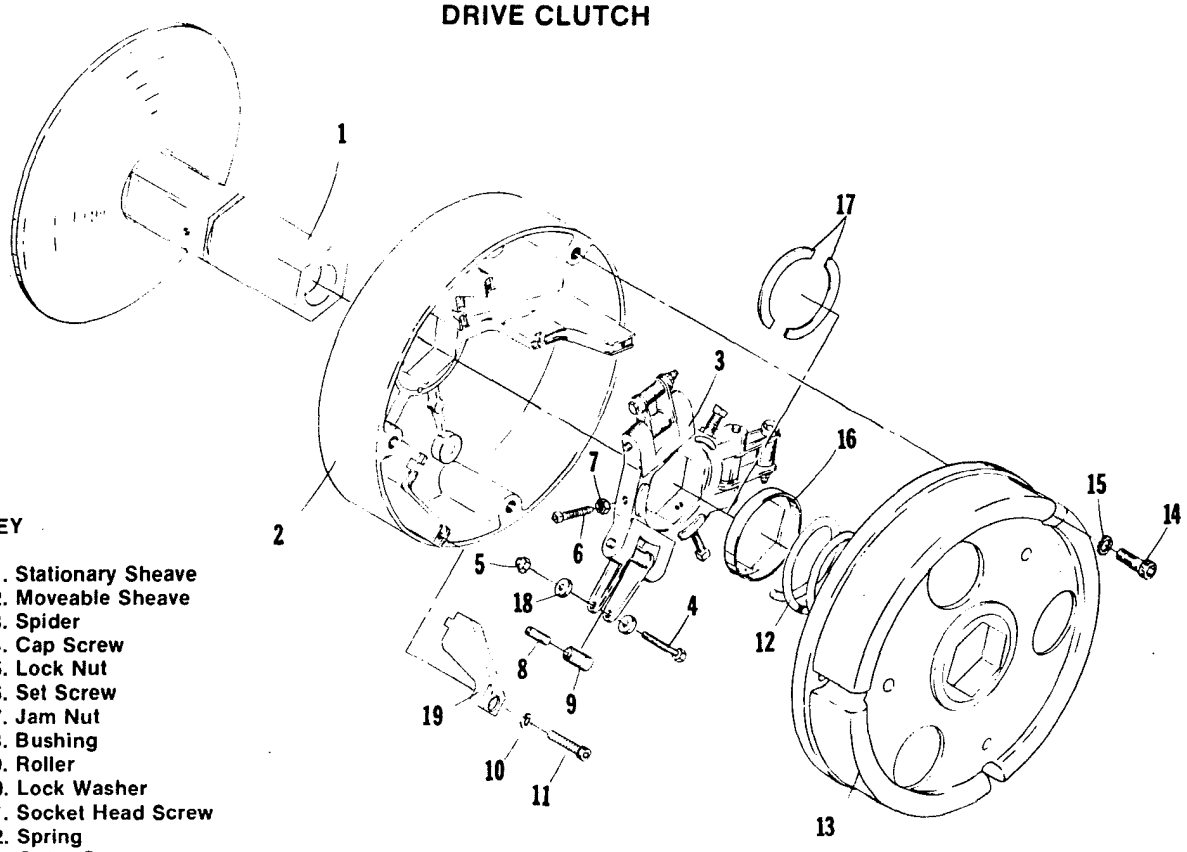
2. Move the drive clutch into position and loop drive belt onto the clutch.

3. Install the drive clutch bolt and lock washer. Tighten the bolt to 7.6 - 8.3 kg-m or 55 - 60 ft-lb.

4. Check alignment between the drive clutch and driven pulley. (See: Drive Clutch/Driven Pulley Alignment, page 94).

Fig. 6-14

DRIVE CLUTCH



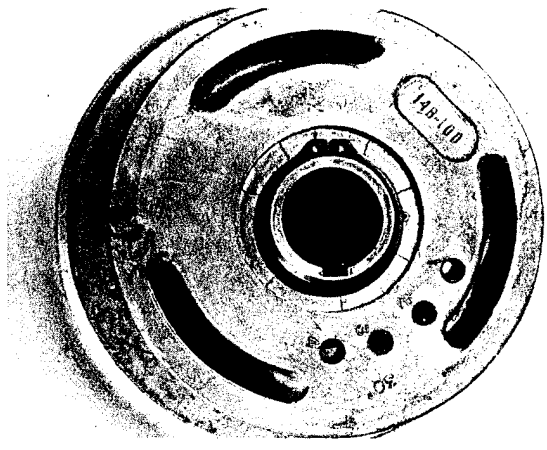
KEY

1. Stationary Sheave
2. Moveable Sheave
3. Spider
4. Cap Screw
5. Lock Nut
6. Set Screw
7. Jam Nut
8. Bushing
9. Roller
10. Lock Washer
11. Socket Head Screw
12. Spring
13. Outer Cover
14. Socket Head Screw
15. Lock Washer
16. Cupped Washer
17. Split Ring
18. Weight
19. Ramp

0700-009

Driven Pulley

Fig. 6-15



A199

Disassembly

1. Rotate the clutch sheaves in opposite directions just enough so that the shoe ramps are not contacting the torque bracket.

2. Force the torque bracket downward slightly; then remove snap ring from the groove in the stationary sheave hub.

3. Carefully allow the torque bracket to slide off the stationary sheave hub; then slide spring off hub.

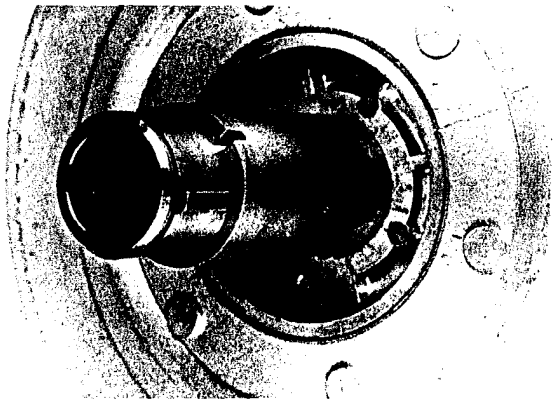
4. If cam bracket sliding shoes need servicing, remove them with a pliers.

5. Slide moveable face off stationary hub.

NOTE: Woodruff key does not have to be removed to disassemble moveable sheave.

6. Remove woodruff key from stationary hub.

Fig. 6-16



A200

7. Slide bearing off stationary hub.

Cleaning

1. Wash grease and foreign matter off all parts using cleaning solvent.

2. If drive belt accumulations are on stationary sheave, hub or moveable sheave, remove the accumulations using cleaning solvent only.

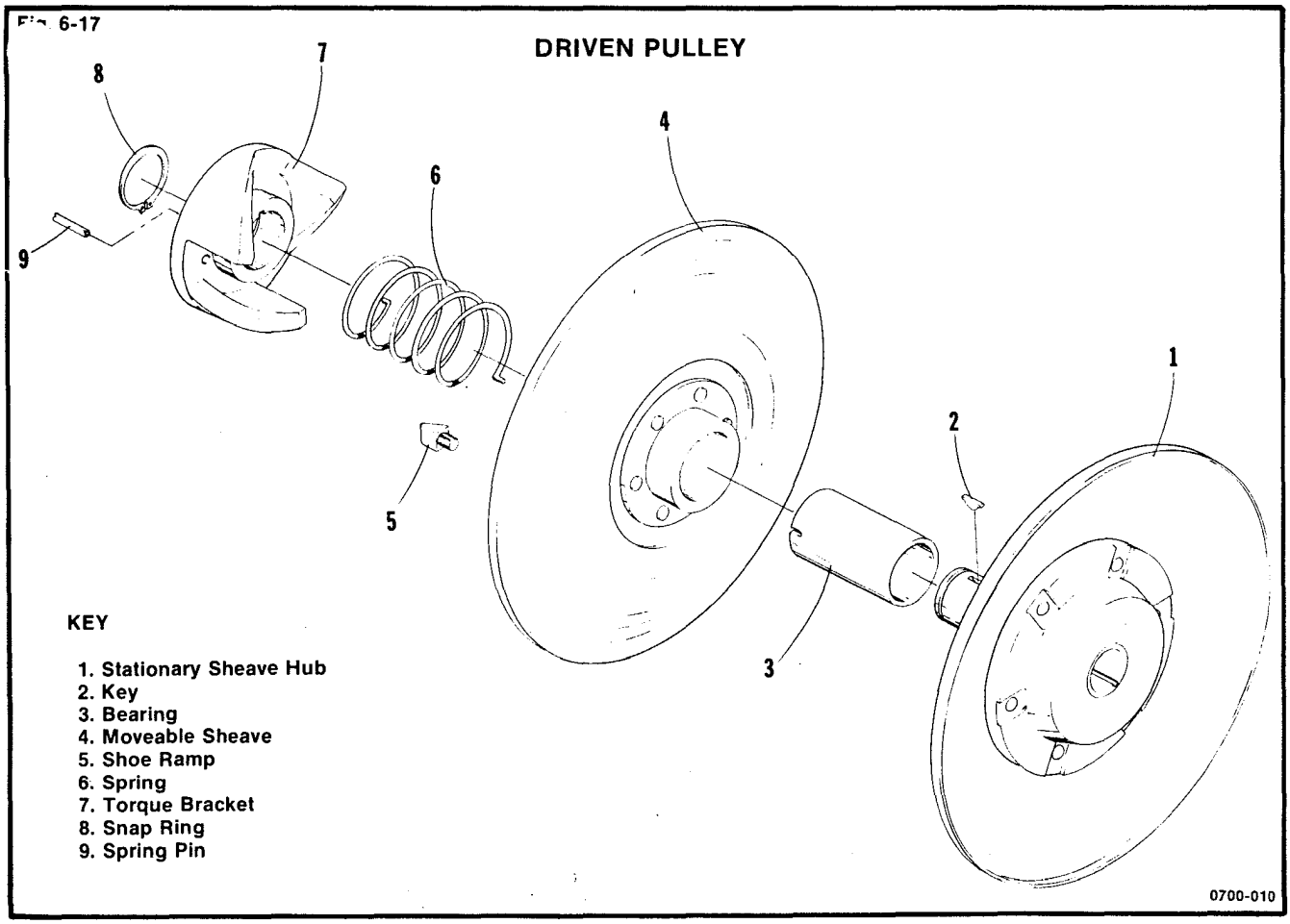
● CAUTION ●

DO NOT use steel wool or a wire brush to clean driven pulley parts. A wire brush or steel wool will gouge the sheaves, thus, the drive belt may not slide properly between sheaves. Decreased performance and possible accelerated belt wear will result.

Inspection

Whenever a part is worn excessively, cracked, defective or damaged in any way, replacement is necessary.

Fig. 6-17



KEY

1. Stationary Sheave Hub
2. Key
3. Bearing
4. Moveable Sheave
5. Shoe Ramp
6. Spring
7. Torque Bracket
8. Snap Ring
9. Spring Pin

0700-010

1. Inspect sliding shoes for damage or wear.
2. Inspect the stationary and moveable sheaves for any broken or loose bolts or rivets.
3. Check torque bracket for cracks, wear and other noticeable damage.
4. Inspect sheaves for rough surfaces, grooves or scratches. Use fine emery cloth to repair minor damage.
5. Inspect spring for distortion, crystallization or breaks.

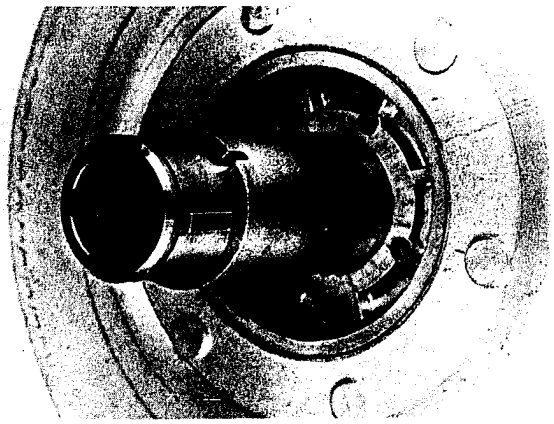
Assembly

1. Seat cam bracket sliding shoes in position in casting.
2. Slide bearing onto the stationary sheave hub.

NOTE: Make sure notched end is facing woodruff key slot.

3. Install woodruff key in stationary sheave hub.
4. Slide moveable sheave onto stationary sheave hub.
5. Place the spring over the stationary sheave hub and hook the turned down end into the hole in the casting on the moveable face.
6. Place the torque bracket over the spring and hook the turned up end into the second hole (standard spring tension) of the torque bracket.
7. Align the keyway in the torque bracket with the key in the shaft. Also align the spring pin with the notch in the bearing.
8. Carefully push the torque bracket onto the shaft just far enough to contact the woodruff key.

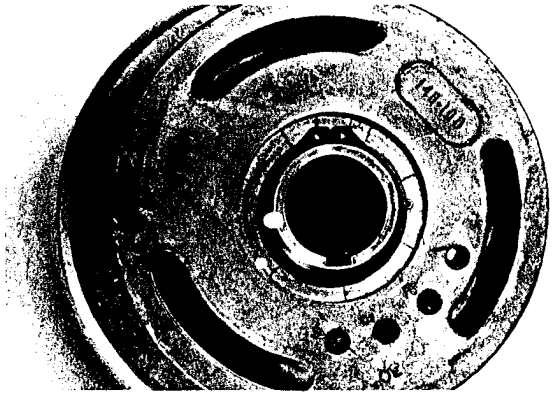
Fig. 6-18



A200

9. Rotate the moveable sheave counterclockwise until there is a slight resistance (spring pressure); then rotate the moveable face an additional 120°.
10. Make sure the spring pin is still aligned with the notch in the bearing; then push the torque bracket down on the shaft until it bottoms on the bearing.
11. Install the snap ring in the groove of the stationary sheave hub.
12. Slowly release the torque bracket against the snap ring.

Fig. 6-19



A199

DRIVEN PULLEY SPECIFICATIONS			
Item		**0226-016**	**0226-019**
Cam Angle		30°	30°
Spring Preload - Counterclockwise		2nd hole 120°	2nd hole 120°
Spring Color		Black	Black
Spring Part Number		0148-070	0148-070
Spring Length w/No Load	— cm	11.7	11.7
	— in.	4.60	4.60
Spring Diameter	— cm	7.3	7.3
	— in.	2.88	2.88
Spring Wire Diameter	— cm	0.4	0.4
	— in.	0.156	0.156

Drive Clutch/Driven Pulley Alignment

The center-to-center distance and the drive clutch alignment are set at the factory and checked during pre-delivery. Normally, no adjustment is required unless the driven pulley or drive clutch is removed or disassembled. However, if premature drive belt failure is experienced or if the drive belt turns over, the alignment must be checked.

Two dimensions that must be checked are PARALLELISM and OFFSET. The first dimension to check and adjust, if required, is parallelism.

1. Unlatch belt guard and remove the drive belt.

2. Install the clutch alignment bar (part no. 0149-099) between the sheaves of the driven pulley. Allow sheaves to release and hold alignment bar in position.

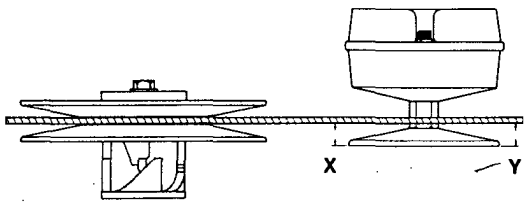
   Allow the bar to rest on the hex shaft.

4. Measure dimension X and Y at front and rear edge of drive clutch. Take all measurements with bar on hex shaft. Compare dimension X and Y with Rule A and B.

   Rule A — Dimension Y must be more than dimension X.

   Rule B — Dimension Y must never exceed dimension X by more than 1.6 mm (1/16-inch).

Fig. 6-20



0725-081

5. If dimension Y is less than dimension X, parallelism between engine crankshaft and driven pulley shaft is not correct. Adjust so that the parallelism is within tolerance and proceed to Offset Check.

Offset Check

Install clutch alignment bar between clutch sheaves as in steps 2 and 3.

NOTE: Alignment bar must extend beyond the front edge of the drive clutch.

1. Measure dimension X and Y at the front and rear edge of the drive clutch. Both dimensions must be between 24.2 - 26.0 mm or 0.954 of-an-inch and 1.024 inches.

Offset Correction

1. Remove cap screw and washers holding driven pulley on driven shaft.

2. Add or remove washers until correct offset is obtained; then install cap screw and washers.

3. Install the drive belt and secure the clutch guard in place.

NOTE: On Panther and Cheetah models, rotate the taper lock collar to change offset (See Fig. 6-45).

Parallelism Adjustment

1. Loosen the bolts and lock nuts securing motor plate to front end.

2. Loosen the lock nuts on the rear motor mount studs.

3. Insert a shim between the bottom of the left rear motor mount (PTO side) and the motor mount bracket on the front end assembly.

4. Tighten all lock nuts; then check parallelism and offset.

NOTE: Continue to add or remove shims until parallelism is obtained.

Chain and Sprockets

CHAIN/SPROCKET SPECIFICATIONS			
Model	Top Sprocket	Lower Sprocket	Chain Pitch
2000S Lynx	19	39	90
2000T Lynx	19	39	90
2000 Jag	19	39	70
3000 Jag	20	39	70
4000 Panther	21	33	90
5000 Panther	21	33	90
5000 Cheetah	21	33	90
FC Pantera	18	33	66
FA Pantera	20	35	68

Inspection

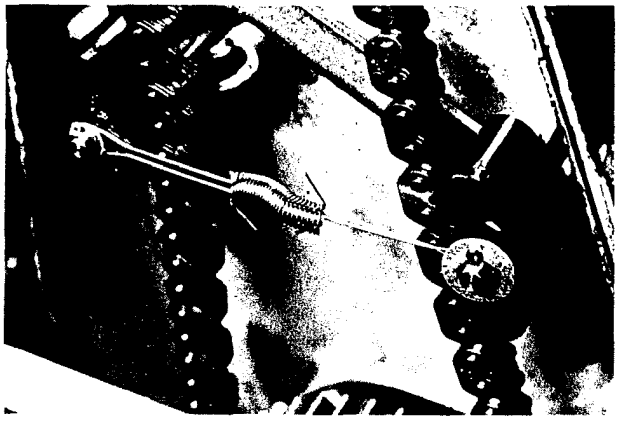
1. Thoroughly wash chain and sprockets using cleaning solvent.
2. Thoroughly dry chain and sprockets using compressed air.
3. Inspect sprockets for damaged or missing teeth.
4. Inspect chain for loose rivet pins or cracked link plates.
5. Replace any damaged, worn or defective parts.

Drive Train Disassembly

Panther/Cheetah

1. Remove belt shield retaining pin; then tilt shield forward. Remove the drive belt from the driven pulley and drive clutch.
2. Place rags in the belly pan below the chain case to absorb the chain lube that will flow out of the case.
3. Remove the six cap screws and washers holding the chain case cover against the chain case. Next, pull the cover away from the chain case. Account for the chain case gasket.
4. Remove the cotter key and flat washer holding the pad tension spring on the pad dowel pin. Slide spring off dowel pin.

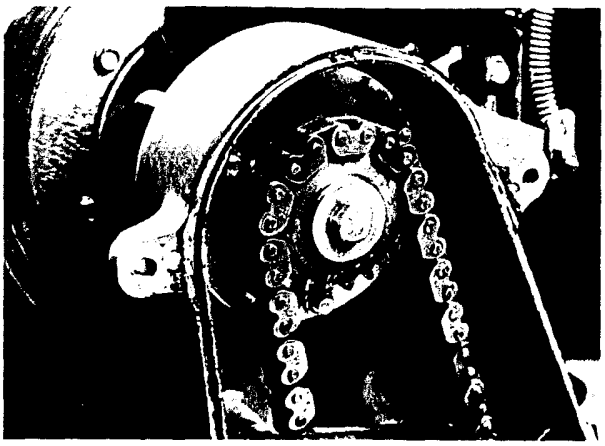
Fig. 6-21



A276

5. Remove the cap screw and flat washer securing the top sprocket on the driven shaft. Slide chain and sprocket off shaft.

6-22



A277

6. If sprocket is bound on shaft, thread cap screw approximately halfway into the driven shaft. Cap screw is used for bottoming the puller bolt when sprocket is being pulled off driven shaft.

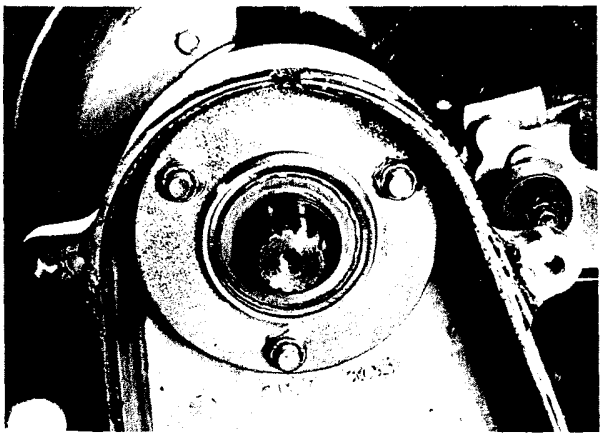
NOTE: On some models with a tight chain, it may be necessary to loosen the bottom sprocket and slide toward end of shaft.

7. Slide upper sprocket and chain off driven shaft. After sprocket is free, remove the cap screw from the driven shaft.

8. Remove lower sprocket from drive shaft using instructions in steps 5-7.

9. Remove the three lock nuts holding bearing flange on the mounting studs. Slide bearing flange off mounting studs.

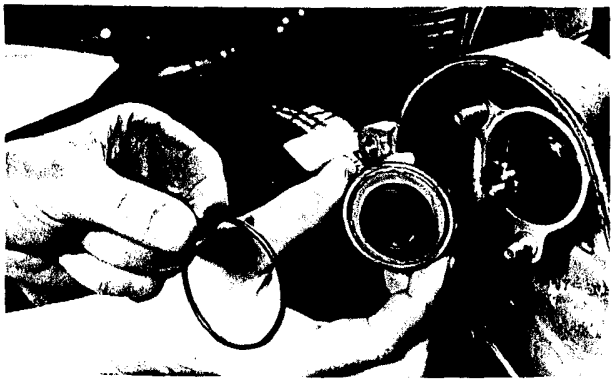
Fig. 6-23



A278

10. Slide O-ring and bearing off driven shaft.

Fig. 6-24



A282

11. Remove the cap screw and flat washer holding the driven pulley on the driven shaft.

NOTE: Account for any shims removed during disassembly.

12. Loosen the set screws holding the two driven pulley lock collars in position on the driven shaft. Drive the bearing lock collar in the direction opposite normal shaft rotation until loose.

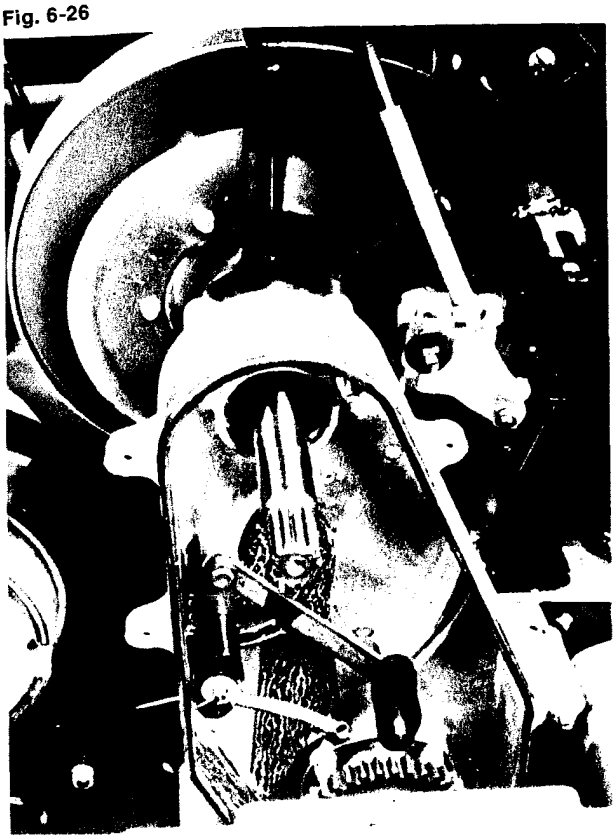
Fig. 6-25

A279

13. Loosen the two cap screws securing the brake assembly to the brake mount.

14. Drive the driven shaft through the driven pulley and chain case. After shaft is removed, account for the driven pulley key.

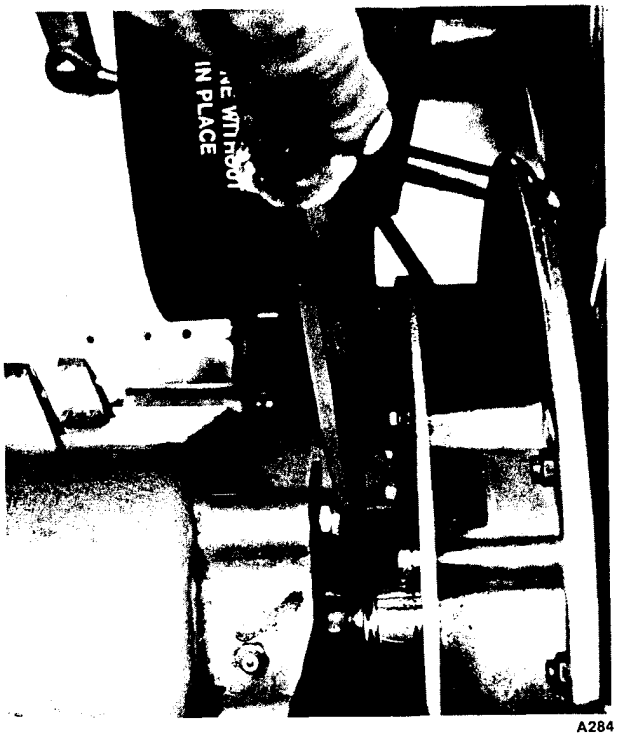
Fig. 6-26



A283

NOTE: When sliding the shaft, hold blade of a large screwdriver between the lock collar and bearing to prevent the shaft from locking up.

Fig. 6-27



A284

15. Just before shaft is completely removed, grasp driven pulley to prevent it from falling into belly pan. Also, slide lock collars off the shaft.

Fig. 6-28

A285

16. Remove the three lock nuts holding the driven pulley guard against the inside of the chain case. Also, remove the cap screw holding bottom of guard to curved section of front end.

17. If bearing on the steering post side of the chain case must be replaced, drive it toward the steering post. Account for the O-ring.

Fig. 6-29

A287

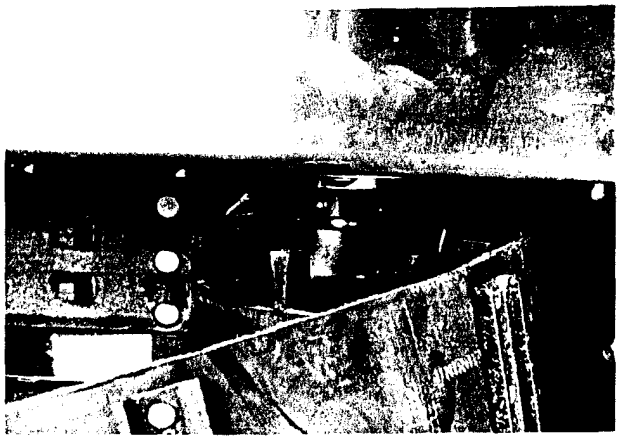
NOTE: To remove the track drive shaft, it will be necessary to remove the skid frame (See: Remove Skid Frame - Panther/Cheetah, and Jag, page 00).

Remove the three lock nuts securing MAG side bearing flanges to the tunnel.

19. Tip snowmobile onto MAG side, using cardboard to protect against scratching.

20. Loosen set screw holding bearing lock collar on MAG end of track drive shaft.

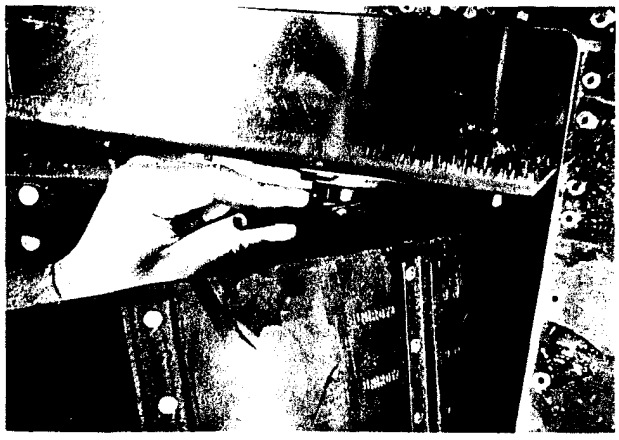
Fig. 6-30



A292

Rotate lock collar in opposite direction of normal shaft rotation.

Fig. 6-31

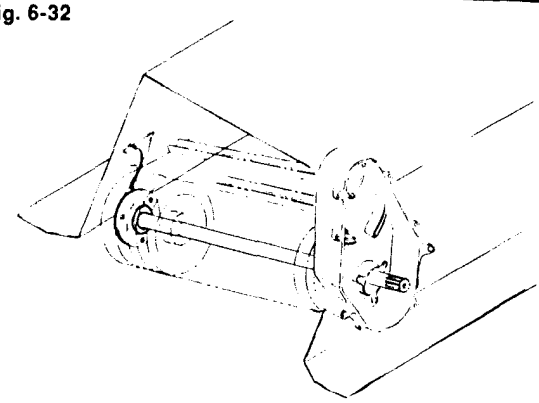


A293

22. Remove the three lock nuts holding bearing flanges to chain case; then remove flange, O-ring and bearing.

23. Slide track drive shaft toward PTO side until its opposite end is out of the MAG side mounting hole in front end assembly; then remove opposite end of shaft from PTO side mounting hole.

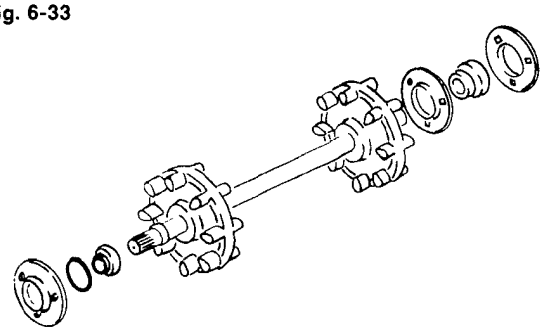
Fig. 6-32



0725-079

24. Track drive shaft can be removed at this time along with the track.

Fig. 6-33



0725-076

Pantera, Jag and Lynx

1. Remove the pulse charger from the Pantera models.

2. Remove clutch shield retaining pin; then lift shield forward.

3. Remove the drive belt.

4. Remove cap screw and flat washer securing driven pulley on driven shaft.

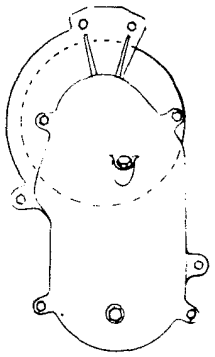
5. Slide driven pulley off driven shaft; then account for driven shaft key.

NOTE: Account for any shims that were removed during disassembly.

6. Tip the snowmobile onto the PTO side. This will keep chain lube from spilling into the belly pan.

7. Remove the four bolts and lock washers holding chain case cover to chain case; then remove cover and gasket.

Fig. 6-34



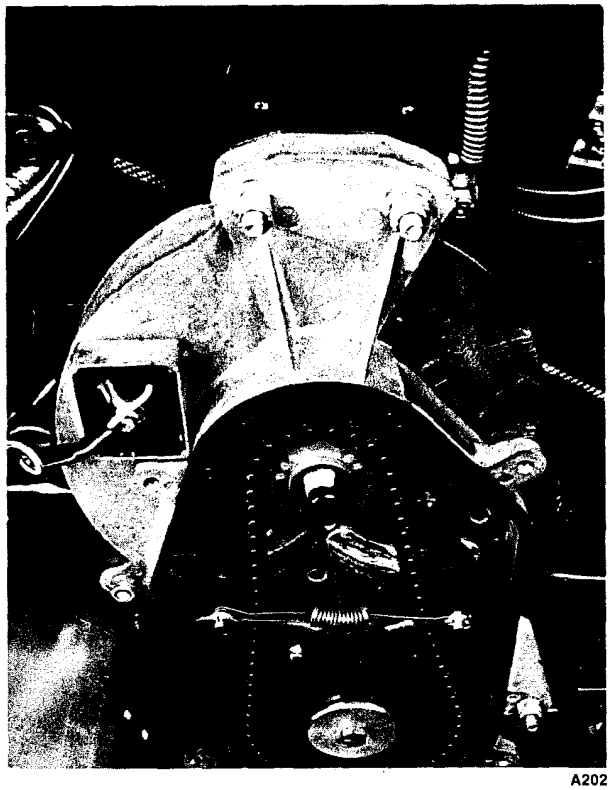
0725-062

8. Remove cotter key and washer securing tensioner spring to link pin; then slide end of spring free of link pin.

NOTE: On the Lynx models, loosen the tension adjuster jam nut; then loosen chain tension adjuster.

9. Remove the cap screws and washers holding both top and bottom sprockets in position.

Fig. 6-35



A202

NOTE: If sprockets will not slide off shaft, thread the cap screw back into the shaft; then use a puller to remove the sprocket. The cap screw is used for bottoming puller bolt.

10. Slide both sprockets and chain off the shafts.

NOTE: Account for any spacer washers removed during disassembly.

11. Remove the three lock nuts holding both the upper and lower MAG side bearing flanges in position. Remove flanges, O-rings and bearings.

12. Loosen the set screw on the PTO side driven shaft bearing; then drive the lock collar opposite the direction of rotation until it turns freely.

NOTE: A small file should be used to remove any burrs left on the shaft by the lock collar set screw.

13. Force the driven shaft toward the PTO side.

NOTE: Rotate the shaft while driving to prevent brake disc from binding on shaft.

14. Slide brake disc free of driven shaft; then remove the woodruff key from the shaft.

15. Tilt driven shaft and remove it from MAG side.

16. Remove the skid frame from the tunnel (See: Remove Skid Frame, Lynx, or Pantera, page 117).

17. Remove the three lock nuts from the PTO side bearing holder carriage bolts.

NOTE: Bearings have radial outers which allow them to swivel, providing clearance for removal.

18. Remove the three PTO side lock nuts securing lower drive shaft bearing.

19. Slide track drive shaft toward MAG side until PTO end of shaft is out of front end mounting hole. Tilt end of shaft away from tunnel; then slide track out of tunnel.

NOTE: If track is to be removed, the idler axle assembly will have to be removed on the Pantera and Lynx models.

Drive Train Inspection

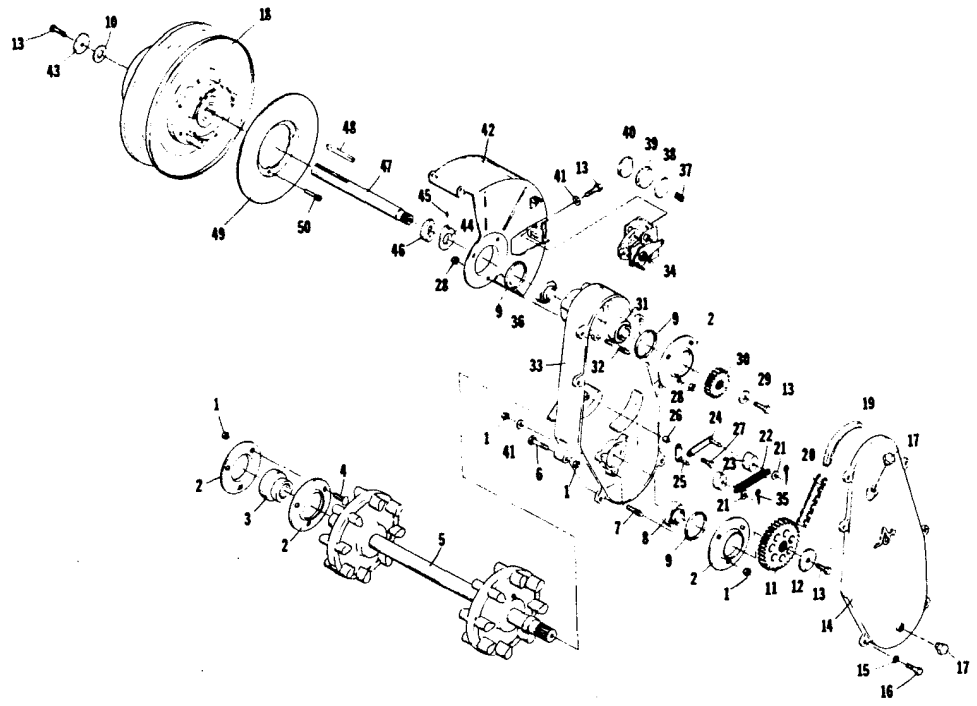
NOTE: Whenever a part is worn excessively, cracked, defective or damaged in any way, replacement is necessary.

1. Thoroughly wash all metallic drive train components in cleaning solvent.
2. Wash all plastic or rubber parts with soap and water.
3. Check drive shaft and driven shaft for damaged splines or stripped threads.
4. Check bearings for any roughness or damage.
5. Examine O-rings and chain case cover gaskets for any breaks or damage.
6. Examine the track for cuts, gouges or broken cleats.
7. Examine the keyways in both the driven shaft and the brake hub.
8. Examine the brake disc for excessive wear or cracks.
9. Examine the brake pads for wear.
10. Examine chain tensioner components.

Drive System Components

Fig. 6-36

PANTHER/CHEETAH

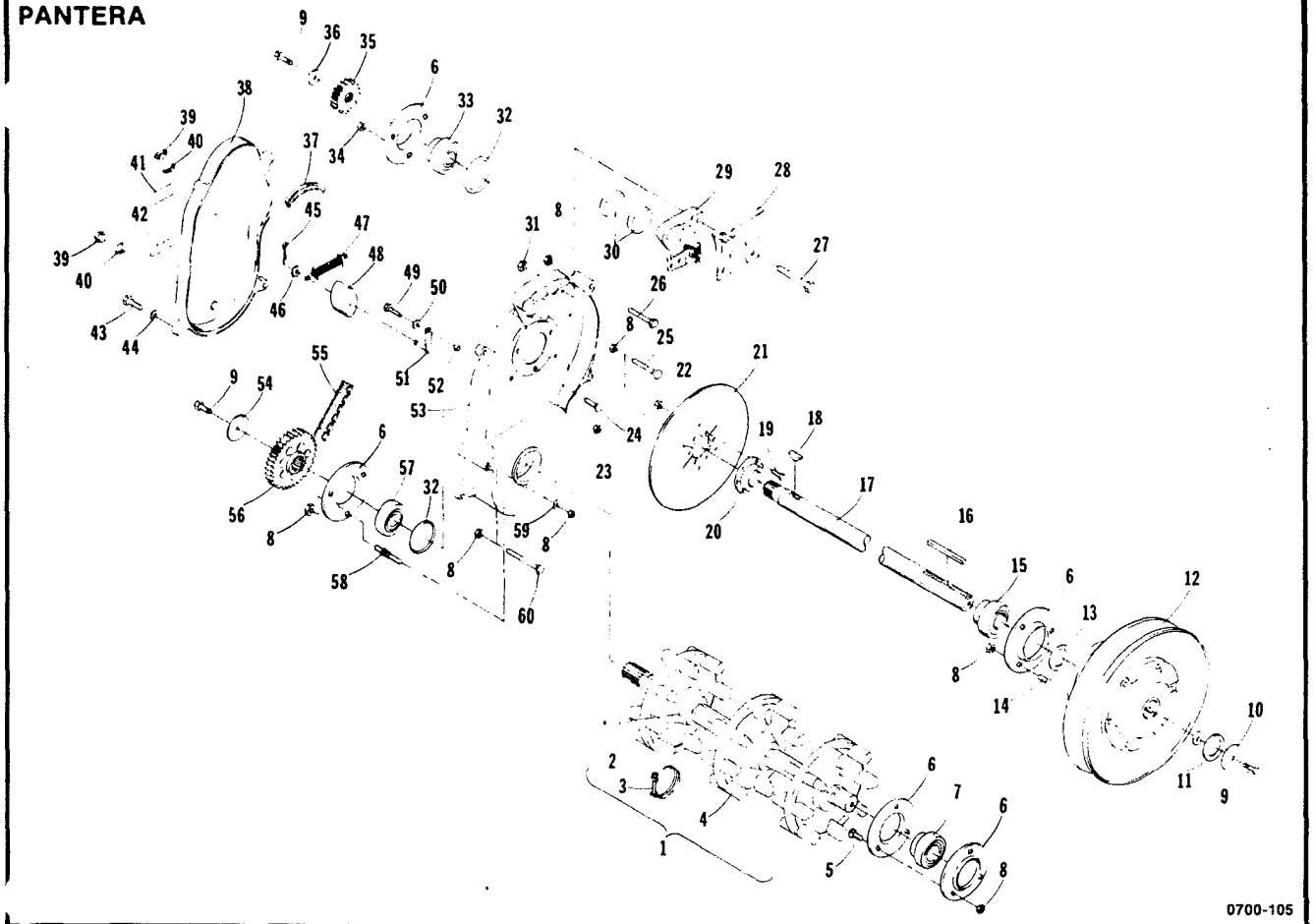


0700-174

Ref. No.	Part No.	Qty.	Description	Ref. No.	Part No.	Qty.	Description
1	8040-426	11	Nut, Lock	26	0107-318	1	Bushing
2	0107-026	4	Plate, Flange	27	8012-039	1	Screw, Cap
3	0107-074	1	Bearing, 1"	28	8041-426	6	Nut, Lock
4	8011-132	3	Bolt, Carriage	29	0123-690	1	Washer
5	0110-881	1	Shaft Assy, Drive	30	0107-408	1	Sprocket, 21 T
6	8011-140	2	Bolt, Carriage	31	0107-223	1	Bearing, 7/8"
7	0107-233	3	Stud, Collar	32	0107-401	3	Stud, Collar
8	0107-224	1	Bearing, 1"	33	0107-305	1	Dropcase
9	0107-003	3	Seal, O-Ring	34	0110-773	1	Brake Assy (Incl. 37-40)
10	8050-247	AR	Washer, 0.68" O.D.	35	0123-082	2	Pin, Cotter
	0123-263	AR	Washer, 1.0" I.D.	36	0107-434	1	Bearing, 1"
11	0107-513	1	Sprocket, 33 T	37	0135-047	1	Spring
12	0123-020	1	Washer	38	0109-218	1	Washer
13	8012-130	5	Screw, Cap-Lock	39	0109-598	1	Puck, Cam Side
14	0107-304	1	Cover, Dropcase	40	0109-597	1	Puck, Carrier Side
15	8053-242	6	Washer, Ext. Lock	41	8050-242	5	Washer
16	8002-132	6	Screw, Cap	42	0107-521	1	Shield, Clutch
17	0123-333	2	Plug	43	0123-019	1	Washer
18	0226-019	1	Clutch, Driven	44	0107-314	1	Collar, Taper Lock
19	0107-326	1	Seal, Dropcase	45	8080-184	2	Set Screw
20	0107-101	1	Chain, 90P	46	0107-308	1	Collar, Taper Lock
21	8050-212	2	Washer	47	0228-022	1	Shaft, Driven
22	0110-718	1	Spring, Tightener Assy	48	0101-076	1	Key, Square
23	0107-411	2	Pad, Tightener	49	0109-614	1	Disc, Brake
24	0107-302	1	Pin/Link-Long	50	0123-673	3	Screw, Cap
25	0107-226	1	Pin/Link-Short				

Fig. 6-37

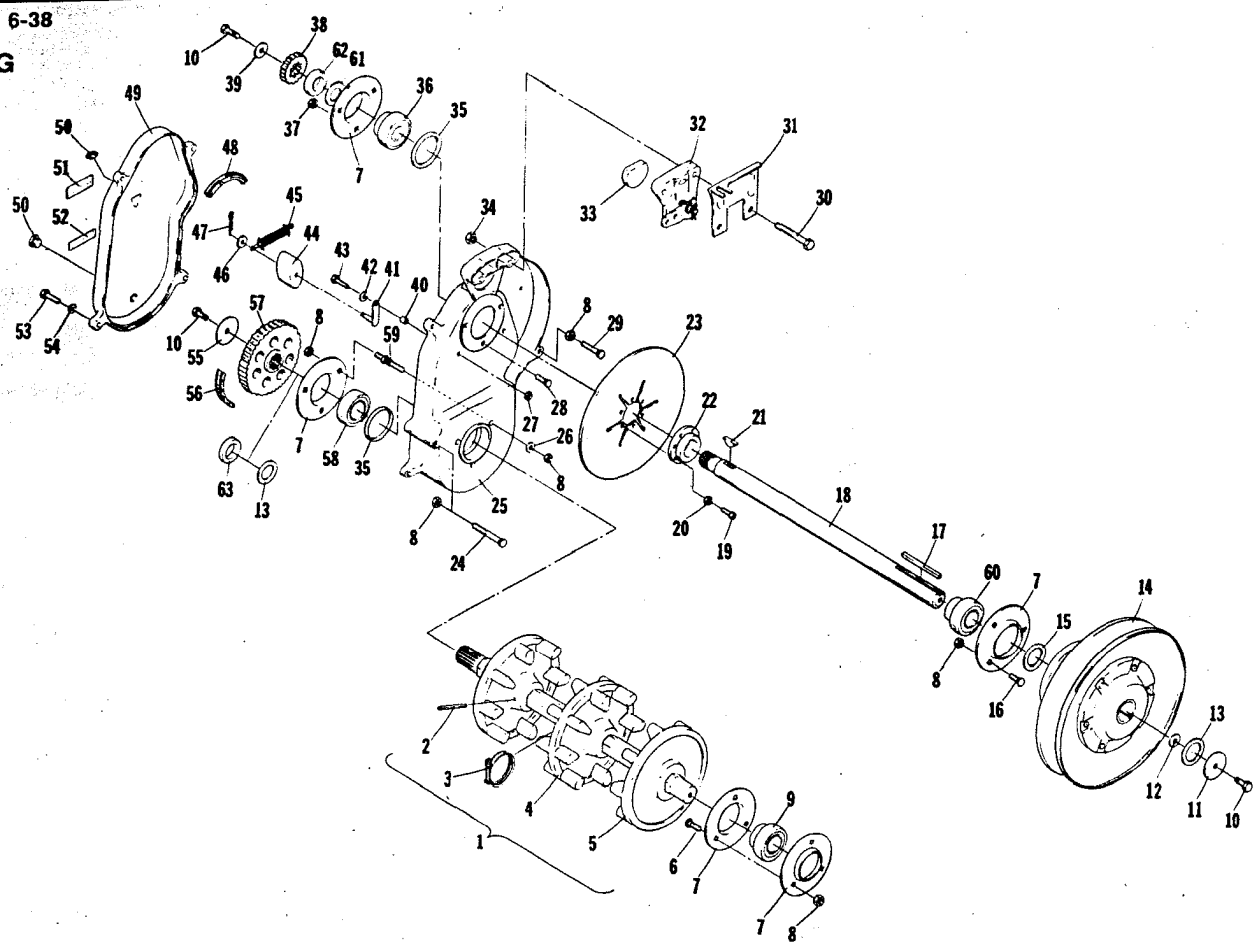
PANTERA



Ref. No.	Part No.	Qty.	Description	Ref. No.	Part No.	Qty.	Description
1	0110-956	1	Drive Shaft Assy	34	8041-426	3	Nut, Lock
2	8070-383	2	Pin, Spring	35	0107-409	1	Sprocket-20T (FA)
3	0123-619	3	Clamp		0107-341	1	Sprocket-18T (FC)
4	0102-143	3	Sprocket-8T	36	0123-690	1	Washer
5	8011-132	3	Bolt, Carriage	37	0107-214	1	Seal
6	0107-026	5	Plate	38	0107-747	1	Cover, Dropcase
7	0107-074	1	Bearing	39	0123-451	2	Plug
8	8040-426	15	Nut, Lock	40	0123-641	2	Washer, Fiber
9	8012-130	3	Screw, Cap-Lock	41	0106-228	1	Decal, "Oil Fill"
10	0123-019	1	Washer	42	0106-229	1	Decal, "Oil Level"
11	0123-053	AR	Washer	43	8002-132	4	Screw, Cap
	0123-578	AR	Washer	44	8053-242	4	Washer, Ext. Lock
12	0226-016	1	Clutch, Driven	45	0123-082	2	Pin, Cotter
13	0123-263	AR	Washer	46	8050-212	2	Washer
14	8011-130	3	Bolt, Carriage	47	0110-907	1	Spring Assy (FA)
15	0107-123	1	Bearing-1"		0110-718	1	Spring Assy (FC)
16	0101-076	1	Key	48	0107-228	1	Pad (FA)
17	0228-034	1	Shaft, Driven		0107-411	1	Pad (FA)
18	0107-133	1	Key		0107-411	2	Pad (FC)
19	8006-399	6	Screw, Cap	49	8002-040	2	Screw, Cap
20	0109-726	1	Hub	50	8050-217	2	Washer
21	0109-411	1	Disc Brake	51	0107-226	2	Pin, Link
22	0123-430	6	Nut, Lock	52	0107-234	2	Bushing
23	8041-366	2	Nut, Lock	53	0107-509	1	Dropcase
24	0123-523	3	Bolt, Ribbed	54	0123-020	1	Washer
25	8011-137	1	Bolt, Carriage	55	0107-215	1	Chain-68P (FA)
26	8002-138	1	Screw, Cap		0107-358	1	Chain-66P (FC)
27	8002-228	2	Screw, Cap	56	0107-325	1	Sprocket-35T (FA)
28	0109-631	1	Bracket		0107-513	1	Sprocket-33T (FC)
	0109-632	1	Caliper, Brake w/Puck	57	0107-224	1	Bearing-1"
	0109-471	2	Puck	58	0107-233	3	Stud
31	8040-486	2	Nut, Lock	59	8050-247	3	Washer
32	0107-003	2	Seal	60	8011-140	1	Bolt, Carriage
33	0107-223	1	Bearing-7/8"				

Fig. 6-38

JAG

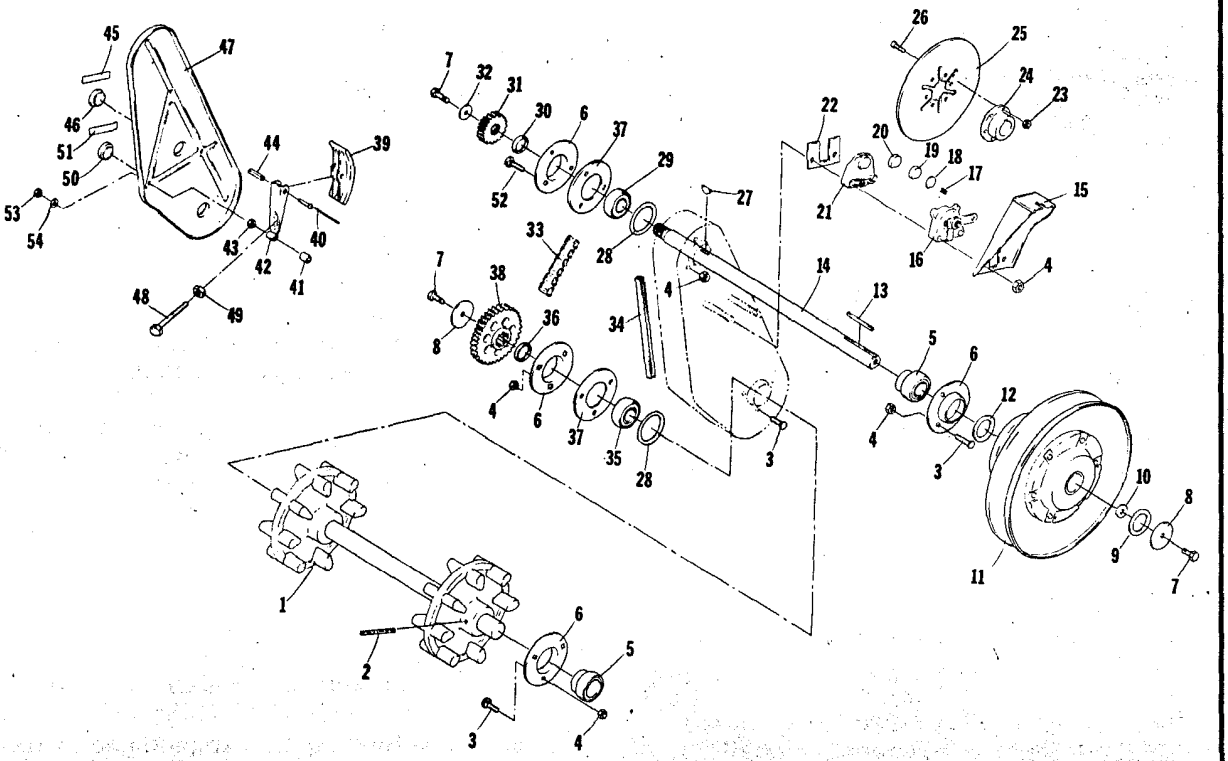


0700-080

Ref. No.	Part No.	Qty.	Description	Ref. No.	Part No.	Qty.	Description
1	0110-897	1	Drive Shaft Assembly	34	8040-486	2	Nut, Lock
2	8070-383	2	Pin, Spring	35	0107-003	2	Seal
3	0123-619	1	Clamp	36	0107-223	1	Bearing 7/8"
4	0102-143	1	Sprocket, Center	37	8041-426	3	Nut, Lock
5	0102-145	2	Sprocket, Outer	38	0107-651	1	Sprocket, 19T(2000)
6	8011-132	3	Bolt, Carriage		0107-409	1	Sprocket, 20T(3000)
7	0107-026	5	Plate, Flange	39	0123-690	1	Washer
8	8040-426	14	Nut, Lock	40	0107-234	2	Bushing
9	0107-074	1	Bearing	41	0107-226	2	Pin, Link
10	8012-130	3	Screw, Cap-Lock	42	8050-217	2	Washer
11	0123-019	1	Washer	43	8002-040	2	Screw, Cap
12	0123-053	AR	Washer	44	0107-411	2	Pad(2000)
13	0123-578	AR	Washer		0107-228	2	Pad(3000)
14	0226-016	1	Clutch, Driven	45	0110-718	1	Spring Assembly
15	0123-263	AR	Washer	46	8050-212	2	Washer
16	8011-130	3	Bolt, Carriage	47	0123-082	2	Pin, Cotter
17	0101-076	1	Key	48	0107-214	1	Seal
18	0228-024	1	Shaft, Driven	49	0107-747	1	Cover, Dropcase
19	8006-399	6	Screw, Cap-Soc	50	0123-333	2	Plug
20	0123-430	6	Nut, Flex	51	0106-228	1	Decal, "Oil Fill"
21	0107-133	1	Key	52	0106-229	1	Decal, "Oil Level"
22	0109-736	1	Hub	53	8002-132	4	Screw, Cap
23	0109-867	1	Disc, Brake (2000)	54	8053-242	4	Washer, External Lock
	0109-411	1	Disc, Brake (3000)	55	0123-020	1	Washer
24	8011-140	1	Bolt, Carriage	56	0107-773	1	Chain, 70P(2000)
25	0107-509	1	Dropcase		0107-216	1	Chain, 70P(3000)
26	8050-247	3	Washer	57	0107-653	1	Sprocket, 39T(2000)
27	8041-366	2	Nut, Lock		0107-220	1	Sprocket, 39T(3000)
28	0123-523	3	Bolt, Ribbed	58	0107-224	1	Bearing 1"
29	8011-136	1	Bolt, Carriage	59	0107-233	3	Stud
30	8002-228	2	Screw, Cap	60	0107-123	1	Bearing
31	0109-631	1	Bracket	61	0123-694	AR	Washer
32	0109-632	1	Caliper, Brake w/Puck	62	0107-662	1	Spacer-Upper(2000)
33	0109-471	2	Puck	63	0107-663	1	Spacer-Lower(2000)

Fig. 6-39

LYNX



Ref. No.	Part No.	Qty.	Description	Ref. No.	Part No.	Qty.	Description
1	0111-495	1	Drive Shaft Assy (Incl. 2)	30	0107-662	2	Spacer
2	8070-414	2	Pin, Spring	31	0107-651	1	Sprocket, 19T(S)
3	8011-130	9	Bolt, Carriage		0107-219	1	Sprocket, 19T(T)
4	8040-426	15	Nut, Lock	32	0123-690	1	Washer
5	0107-074	2	Bearing, 1"	33	0107-652	1	Chain, 90P(S)
6	0107-026	4	Plate		0107-101	1	Chain, 90P(T)
7	8012-130	3	Screw, Cap-Lock	34	0107-646	1	Seal
8	0123-019	2	Washer	35	0107-224	1	Bearing, 1"
9	0123-578	AR	Washer	36	0107-663	1	Spacer
10	0123-053	AR	Washer	37	0107-002	2	Gasket
11	0226-016	1	Clutch, Driven	38	0107-653	1	Sprocket, 39T(S)
12	0123-263	AR	Washer		0107-220	1	Sprocket, 39T(T)
13	0101-076	1	Key	39	0107-272	1	Pad
14	0228-032	1	Shaft, Driven	40	8060-482	2	Rivet
15	0109-956	1	Bracket	41	0107-664	1	Spacer
16	0109-936	1	Caliper Assy w/Puck	42	0107-273	1	Arm
17	0135-047	1	Spring	43	8040-366	1	Nut, Lock
18	0109-218	1	Washer	44	8070-375	1	Pin, Spring
19	0109-598	1	Puck, Cam Side	45	0106-228	1	Decal, "Oil Fill"
20	0109-597	1	Puck Carrier Side	46	0107-188	1	Plug
21	0109-937	1	Carrier, w/Puck	47	0107-645	1	Cover
22	0107-674	1	Spacer	48	0123-572	1	Screw, Cap
23	0123-430	6	Nut, Lock	49	8042-426	1	Nut, Hex
24	0109-736	1	Hub	50	0107-065	1	Plug
25	0109-411	1	Disc, Brake	51	0106-229	1	Decal, "Oil Check"
26	8006-399	6	Screw, Cap-Socket	52	8011-129	3	Bolt, Carriage
27	0107-133	1	Key	53	8041-366	3	Nut, Lock
28	0107-003	2	Seal, "O" Ring	54	0123-436	3	Washer, Rubber
29	0107-223	1	Bearing, 7/8"				

Drive Train Assembly

Panther/Cheetah

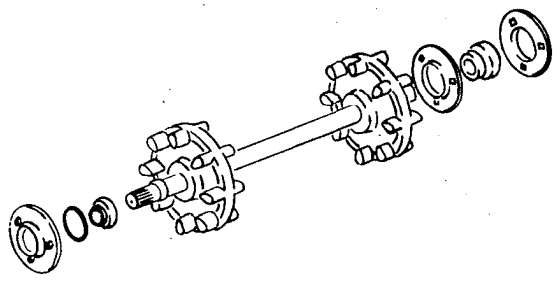
1. Make sure all parts are clean and have been inspected. Refer to figure 6-36 for correct parts placement.

2. Place track in position in the chassis tunnel.

3. Place track drive shaft between track. Splined end of shaft must point toward chain case.

4. In sequence, slide lock collar (large ID toward end of shaft), bearing flange (radiused part of flange toward lock collar), bearing (race toward lock collar), and another bearing flange (radiused part of flange toward end of shaft) onto the non-splined end of track drive shaft.

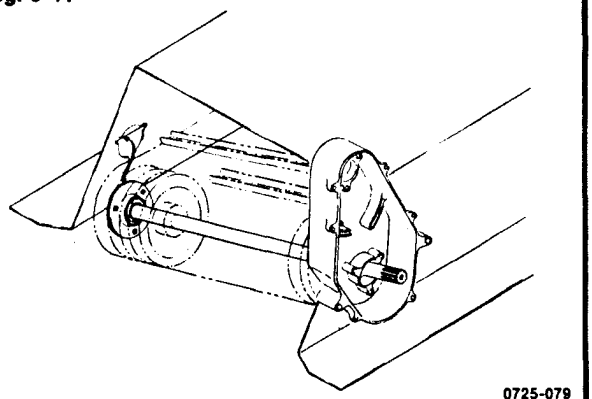
Fig. 6-40



0725-076

5. Lift track drive shaft and track into position between the tunnel; then push splined end of track drive shaft through hole in chain case and front end. Continue to push shaft through hole until opposite end of shaft can be pushed through hole in MAG side of tunnel.

Fig. 6-41



0725-079

6. With track in position, swing drive shaft up and slide non-splined end of shaft through hole in MAG side of tunnel.

7. Align holes in bearing flanges with holes in MAG side of tunnel and front end. Retain parts in place with three carriage bolts and lock nuts. DO NOT tighten lock nuts.

NOTE: Head of carriage bolt must be positioned on inside of tunnel. Secure speedometer flange or battery ground if so equipped.

8. Slide bearing onto splined end of track drive shaft and into chain case until bearing bottoms against shoulder on track drive shaft.

NOTE: Non-sealed side of bearing must face toward inside of chain case to ensure proper bearing lubrication.

9. Install O-ring over bearing.

10. Slide bearing flange onto studs. Secure both MAG and PTO end flange lock nuts to 2.2-2.5 kg-m or 16 - 18 ft-lb.

11. Slide the lower sprocket into position; then secure with a cap screw and flat washer. Tighten to 2.2 - 2.5 kg-m or 16 - 18 ft-lb.

NOTE: The sprocket must be tightened first to ensure the bearing inner race is properly locked.

12. Tip snowmobile onto PTO side. Use cardboard to protect against scratching.

13. With the lower sprocket secured, slide the lock collar against the MAG side bearing. Rotate lock collar in direction of normal shaft rotation to lock bearing.

14. Tighten lock collar set screw.

15. Install the skid frame (See: Install Skid Frame, pages 123-124).

16. Position the snowmobile upright.

17. Move the upper chain case bearing nearest the steering post into position; then move O-ring into place. Secure bearing and O-ring with driven pulley shield. DO NOT tighten at this time.

18. Slide driven shaft through bearing starting from the PTO side. Splined end of shaft must face outward.

19. In sequence, slide lock collar and offset adjusting collar onto the non-splined end of the shaft. The bearing lock collar with the recessed inside diameter must face the inside bearing collar so bearing can be locked in place.

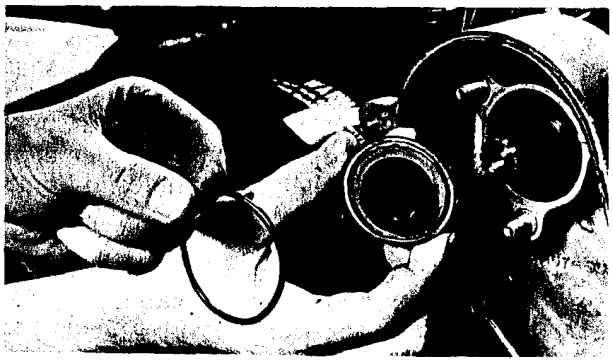
20. Move the driven pulley into position making sure brake disc is positioned between the brake pucks. Continue to insert driven shaft.

21. Apply a generous amount of low temperature grease between the driven shaft bearings.

22. Slide remaining bearing onto the splined end of driven shaft until it bottoms against the shoulder of the shaft. Make sure open side of bearing faces inward.

23. Continue to slide shaft through bearing until bearing is seated in chain case. Slide O-ring onto bearing.

Fig. 6-42



A282

24. Slide bearing flange onto studs. Secure both the flange and the driven pulley shield with lock nuts. Tighten nuts to 2.2 - 2.5 kg-m or 16 - 18 ft-lb.

25. Install the drive chain over the lower sprocket; then slide top sprocket and chain onto driven shaft. Install the cap screw and flat washer; then tighten to 2.2 - 2.5 kg-m or 16 - 18 ft-lb. Check Alignment (See: Sprocket Alignment, page 108).

26. Slide lock collar onto bearing collar; then drive lock collar forward (counterclockwise) to secure bearing.

NOTE: Lock collar is secured tightly when bearing begins to turn with the collar.

Fig. 6-43

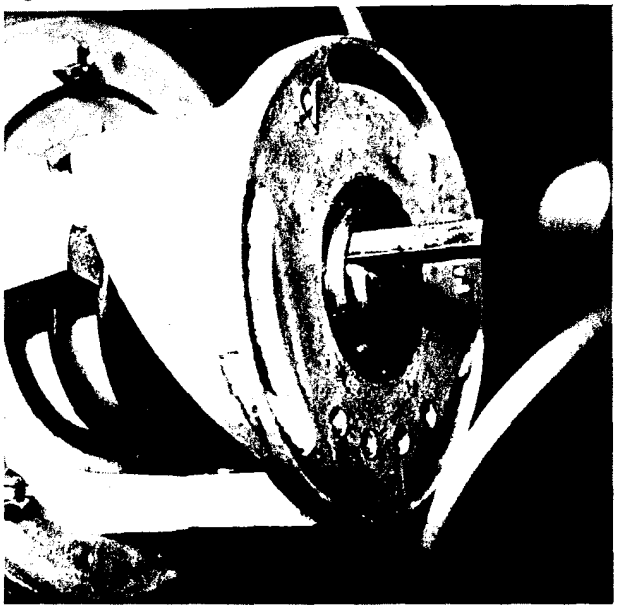
A289

27. Install chain tensioner spring on dowel pin of the chain tightener. Next, slide flat washer onto dowel pin and retain parts with a cotter key. Pour 8 ounces of chain lubricant into case.

28. Place chain case gasket in position; then place cover against chain case and secure with six cap screws and lock washers. Tighten cap screws to 1.4 kg-m or 10 ft-lb.

29. Rotate driven pulley until keyway of pulley and shaft align; then insert long key.

Fig. 6-44

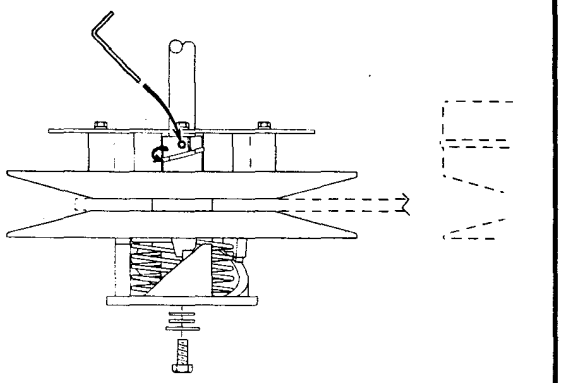


A288

30. Check clutch alignment (See: Drive Clutch/-Driven Pulley Alignment, page 94). Adjust alignment by rotating adjusting collar. When alignment is correct, tighten set screw in collar.

NOTE: Be sure alignment is not changed when set screw is tightened.

Fig. 6-45



0725-169

31. Secure the driven pulley with cap screw and washer. It may be necessary to add or remove shims on the end of the shaft. Care must be taken to ensure there is no excessive "side load" on the bearings due to binding.

32. Check brake adjustment.

33. Install drive belt; then secure belt shield.

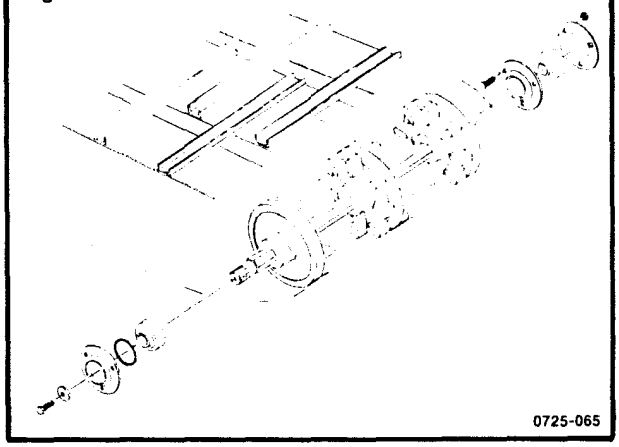
Pantera, Jag and Lynx

1. Make sure all parts are clean and have been inspected. The following instructions are general for these models. Refer to figures 6-37 to 6-39 for correct parts placement for each particular model.

2. Position track drive shaft between track so splined end is on MAG side.

3. In sequence, slide lock collar (large ID) toward end of shaft), retainer plate (flange toward lock collar), bearing (lock flange toward lock collar), and retainer plate (flange toward end of shaft) on the non-splined end of track drive shaft.

Fig. 6-46



0725-065

NOTE: Assembly of the Lynx drive shaft involves slightly different instructions. Refer to Fig. 6-39 for assembly drawing.

4. Lift track and drive shaft assembly into position; then push splined end of shaft through hole in chain case and front end.

5. Swing PTO end of drive shaft up; then align holes in retainer plates with holes in tunnel and front end.

6. Insert three carriage bolts from the inside of the tunnel through retainer plate(s), tunnel, front end and speedometer drive head (if so equipped).

NOTE: Make sure the short speedometer drive cable is in position on machines equipped with speedometer kits.

7. On Pantera and Jag models, slide MAG side bearing onto shaft (sealed side toward track sprockets); then install O-ring, bearing plate and lock nuts. DO NOT tighten at this time. On Lynx models, install the bearing, O-ring, gasket, bearing plate and lock nuts. DO NOT tighten.

8. Place the lower sprocket onto splines (be sure to install spacer washer on Lynx models). Then secure with a cap screw and washer. tighten to 2.2 - 2.5 kg-m or 16 - 18 ft-lb.

9. At this time tighten the lock nuts securing the drive shaft bearing plates to 2.2 - 2.5 kg-m or 16 - 18 ft-lb.

10. Install the skid frame (See: Install Skid Frame, pages 123-124).

11. Slide the PTO side lock collar against the bearing; then drive collar in the direction of normal shaft rotation. Tighten collar set screw.

12. Referring to the component drawings, install the driven shaft and components.

CAUTION

Make sure brake disc and woodruff key are correctly positioned during driven shaft installation.

13. With the driven shaft bearings and retainers in position but not tight, loop the chain around the lower sprocket and slide chain with top sprocket onto the driven shaft. Check alignment (See: Sprocket Alignment).

14. Secure sprocket with a cap screw and washer; then tighten to 2.2 - 2.5 kg-m or 16-18 ft-lb.

15. In order, tighten MAG side retainer nuts and PTO side retainer nuts.

16. Rotate the shaft several times. Slide the lock collar against the bearings; then drive collar in the direction of normal shaft rotation and tighten collar set screw.

17. Place the driven pulley in position and align clutches (See: Drive Clutch/Driven Pulley Alignment, page 94).

18. Using the shims necessary for alignment, allow a maximum of 0.060 of-an-inch "float" of the driven pulley.

19. Tip the snowmobile onto the MAG side, use cardboard to prevent scratching.

20. On Jag and Pantera models, connect the chain tension spring and secure with a washer and cotter pin. On Lynx models, tighten the tensioner bolt until there is about 3/8 of-an-inch slack in the chain; then tighten tensioner jam nut.

21. Pour 8 ounces of chain lubricant into the chain case.

22. Place chain cover gasket in position; then install cover and secure in position.

23. Check brake adjustment.

24. Install the pulse charger on Pantera models.

25. Install drive belt; then secure belt shield.

Sprocket Alignment

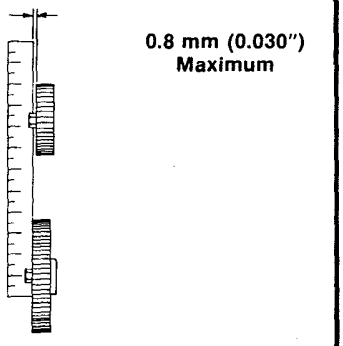
1. Slide the sprockets into position without the chain.

2. Lay a straightedge against the sprocket faces. No visible gap is to be evident between straightedge contact surface and sprocket faces.

3. If top sprocket is to the inside of being parallel, install a shim behind the top sprocket.

4. If bottom sprocket is to the inside of being parallel, install a shim behind the bottom sprocket.

Fig. 6-47



NOTE: A maximum of 0.8 mm or 0.030 of-an-inch gap is acceptable if the exact thickness shim is not available.

5. Install chain and sprockets; then install 8 ounces of chain lubricant.

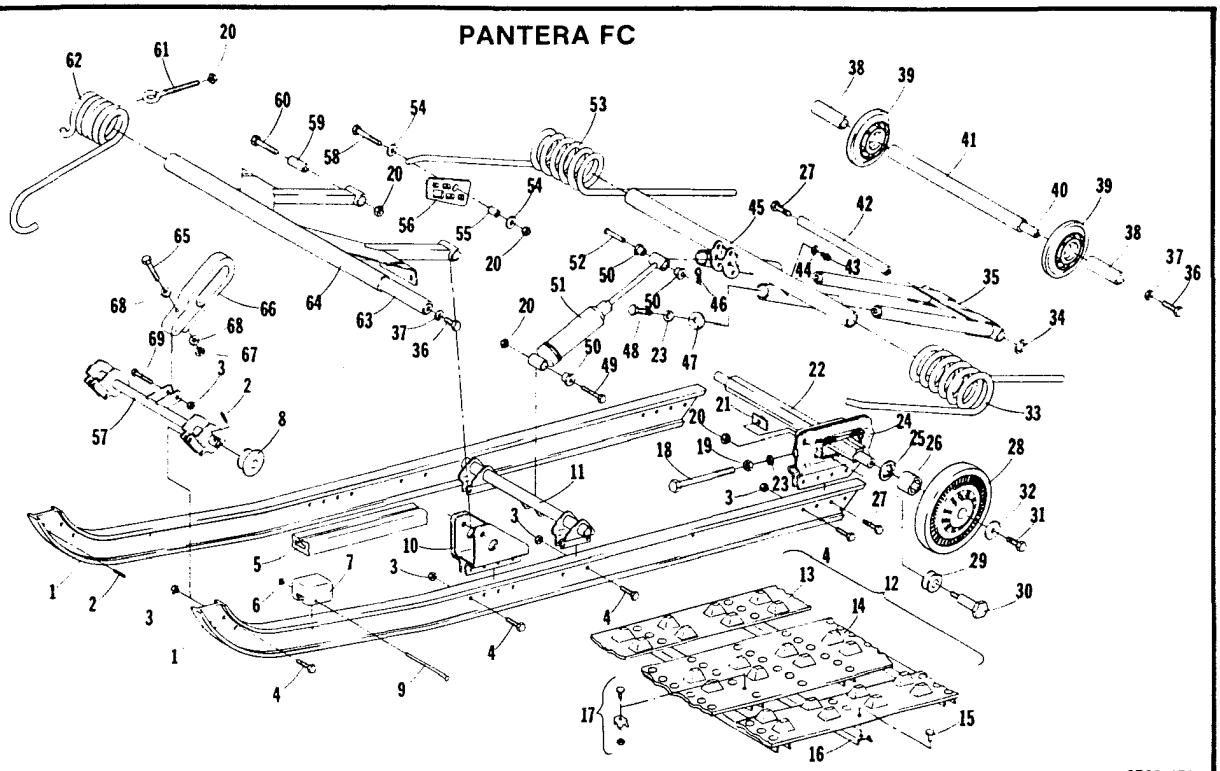
SECTION 7 — SUSPENSION

TABLE OF CONTENTS

The skid frames have been grouped according to similar features. The Pantera and Lynx have been grouped, except in certain cases where the Pantera FC model is listed separately. The Panther, Cheetah and Jag form another group. There are basic differences in each model and for these differences consult the parts illustration for each model below.

Fig. 7-1

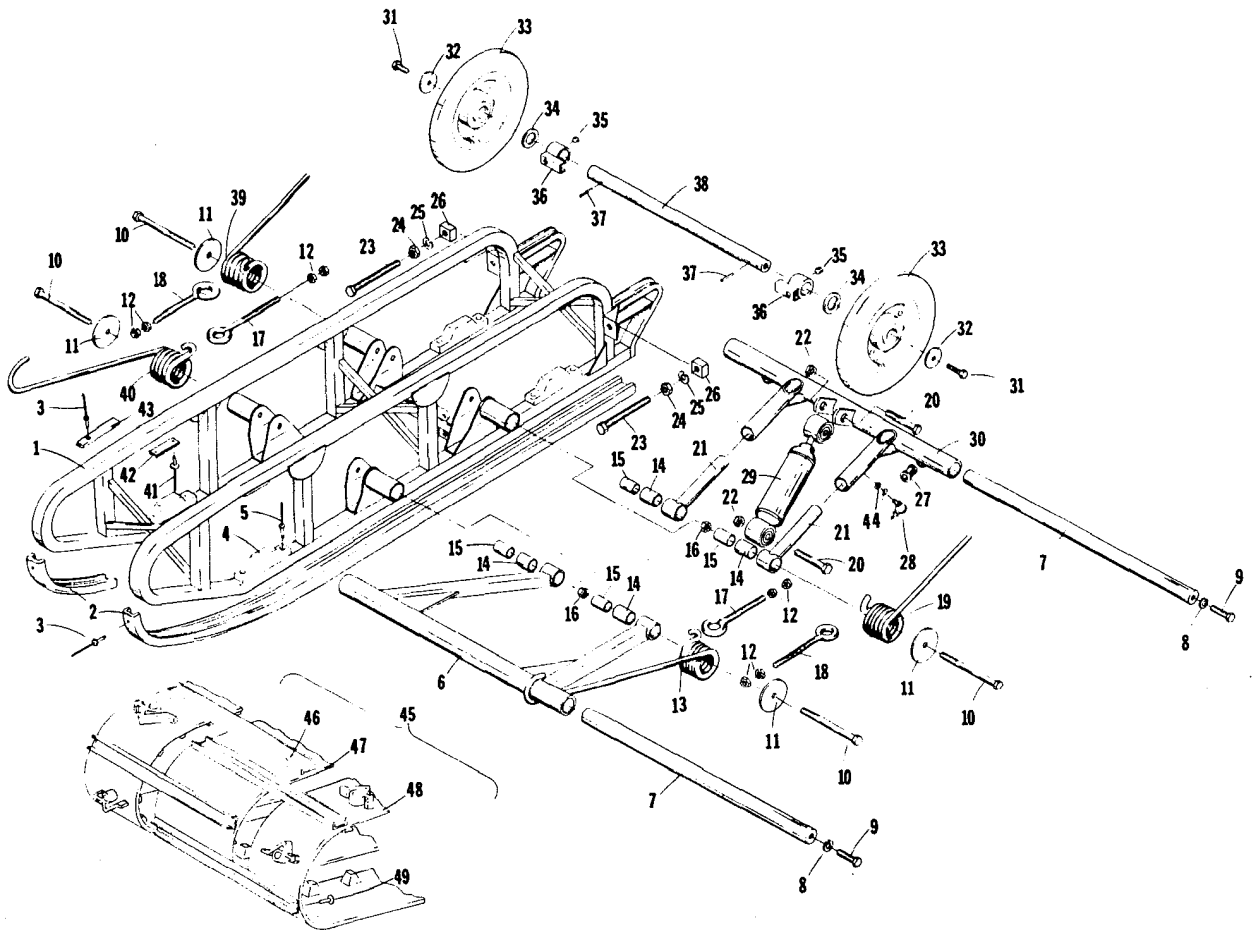
PANTERA FC



Ref. No.	Part No.	Qty.	Description	Ref. No.	Part No.	Qty.	Description
1	0114-076	2	Rail	36	8002-222	6	Screw, Cap
2	8070-285	8	Pin, Spring	37	8051-272	6	Washer, Lock
3	8040-426	23	Nut, Lock	38	0114-125	2	Spacer, Outside
4	8002-132	22	Screw, Cap	39	0114-085	2	Wheel, Idler
5	0104-865	2	Strip, Wear	40	0104-781	1	Axle, Idler
6	0123-766	4	Nut, Push	41	0104-916	1	Spacer, Inside
7	0104-631	4	Pad, Shock	42	0104-765	1	Axle, Rear Arm
8	0104-779	2	Roller, Spring	43	0104-062	5	Zerk, Grease
9	0123-767	4	Rivet, Solid	44	8050-212	5	Washer
10	0114-068	2	Bracket, Front Arm	45	0114-079	1	Arm, Rear
11	0114-069	1	Bracket, Shock Mtg.	46	0301-337	1	Pin, Hair
12	0102-232	1	Track Assy (Incl. 13-17)	47	0123-570	2	Washer
13	0102-200	2	Belt, Outer	48	8012-192	2	Screw, Cap-Lock
14	0102-199	1	Belt, Center	49	8002-227	1	Screw, Cap
15	0123-729	416	Rivet, Solid	50	0103-099	4	Bushing
	0134-815	AR	Rivet, Threaded w/Nut (Pkg.50)	51	0106-669	1	Shock Absorber
16	0102-202	48	Cleat, Channel	52	0114-074	1	Pin, Shock
17	0134-981	1	Ice Stud Kit-3 Point (Pkg.50)	53	0114-064	1	Spring, Rear-Right
18	0123-703	2	Screw, Cap	54	8050-282	4	Washer
19	8042-486	2	Nut, Hex	55	0114-072	2	Tube, Pivot
20	8040-486	9	Nut, Lock	56	0114-062	1	Adjustment-Right
21	0104-838	2	Plate/Nut, Weldment		0114-063	1	Adjustment-Left
22	0104-756	1	Axle, Rear	57	0104-978	1	Crossbrace, Front
23	8051-277	4	Washer, Lock	58	8002-225	2	Screw, Cap
24	0104-908	1	Housing, Rear Axle-Right	59	0104-629	2	Spacer
	0104-909	1	Housing, Rear Axle-Left	60	8002-228	2	Screw, Cap
25	0104-784	2	Washer, Hex	61	2272-037	2	Eyebolt
26	0104-785	2	Spacer	62	0104-980	1	Spring, Front-Right
27	8012-132	2	Screw, Cap-Lock		0104-981	1	Spring, Front-Left
28	0104-934	2	Wheel, Idler	63	0104-748	2	Axle
29	0104-922	2	Roller, Rear Spring	64	0114-071	1	Arm, Front
30	0104-842	2	Bolt, Shoulder	65	8002-048	1	Screw, Cap
31	8012-130	2	Screw, Cap Lock	66	0114-138	1	Stop, Front Arm
32	0123-019	2	Washer	67	8040-366	1	Nut, Lock
33	0114-065	1	Spring, Rear-Left	68	8050-221	2	Washer
34	0123-439	2	Washer	69	8002-135	1	Screw, Cap
35	0104-790	1	Telescope, Rear Arm				

Fig. 7-2

JAG

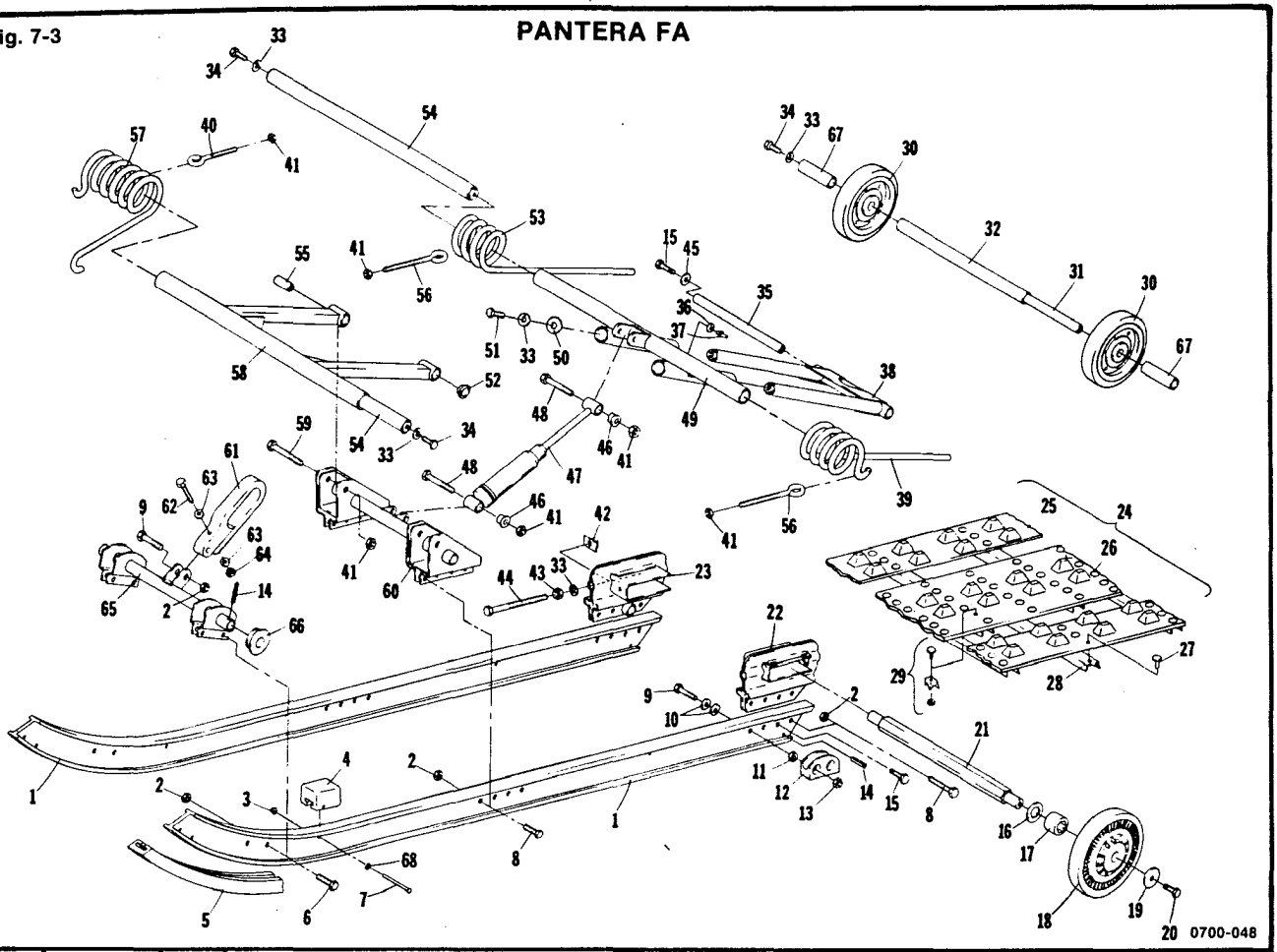


0700-012

Ref. No.	Part No.	Qty.	Description	Ref. No.	Part No.	Qty.	Description
1	0104-469	1	Frame	26	0123-356	2	Nut, Square
2	0104-217	1	Hi-Fax	27	0104-092	2	Bushing
3	8060-488	56	Rivet	28	0123-627	2	Grease Zerk
4	0104-256	4	Pad	29	0106-173	1	Shock Absorber
5	8060-486	8	Rivet	30	0104-459	1	Arm Assembly
6	0104-221	1	Front Arm	31	8012-220	2	Screw, Cap-Lock
7	0104-592	2	Axle	32	0123-051	2	Washer
8	8051-277	4	Washer, Lock	33	0104-934	2	Wheel
9	8002-222	4	Screw, Cap	34	0123-018	2	Washer
10	0123-032	4	Screw, Cap	35	8080-305	2	Set Screw
11	0123-020	4	Washer	36	0104-468	2	Spacer
12	8042-486	8	Nut	37	8070-286	2	Pin, Spring
13	0104-032	1	Spring, Front-Left	38	0104-464	1	Axle, Rear
14	0104-107	4	Bushing	39	0104-194	1	Spring, Rear-Right
15	0104-108	4	Pivot, Insert	40	0104-033	1	Spring, Front-Right
16	8040-516	4	Nut, Lock	41	0123-251	8	Rivet
17	2272-063	2	Eye Bolt	42	0104-073	4	Pad
18	2272-037	2	Eye Bolt	43	0104-348	2	Strip, Wear
19	0104-195	1	Spring, Rear-Left	44	0123-205	4	Washer
[illegible]	8002-318	2	Screw, Cap	45	0110-924	1	Track Assembly
[illegible]	0110-266	2	Arm, w/Bushing	46	0102-093	46	Cleat
22	8040-546	2	Nut, Lock	47	0102-183	1	Belt-Center
23	0123-449	2	Screw, Cap	48	0102-182	2	Belt-Outer
24	8042-546	2	Nut	49	0123-729	AR	Rivet, Solid
25	8051-302	2	Washer, Lock		0134-815	AR	Rivet, Threaded w/Nut (Pkg. 50)

Fig. 7-3

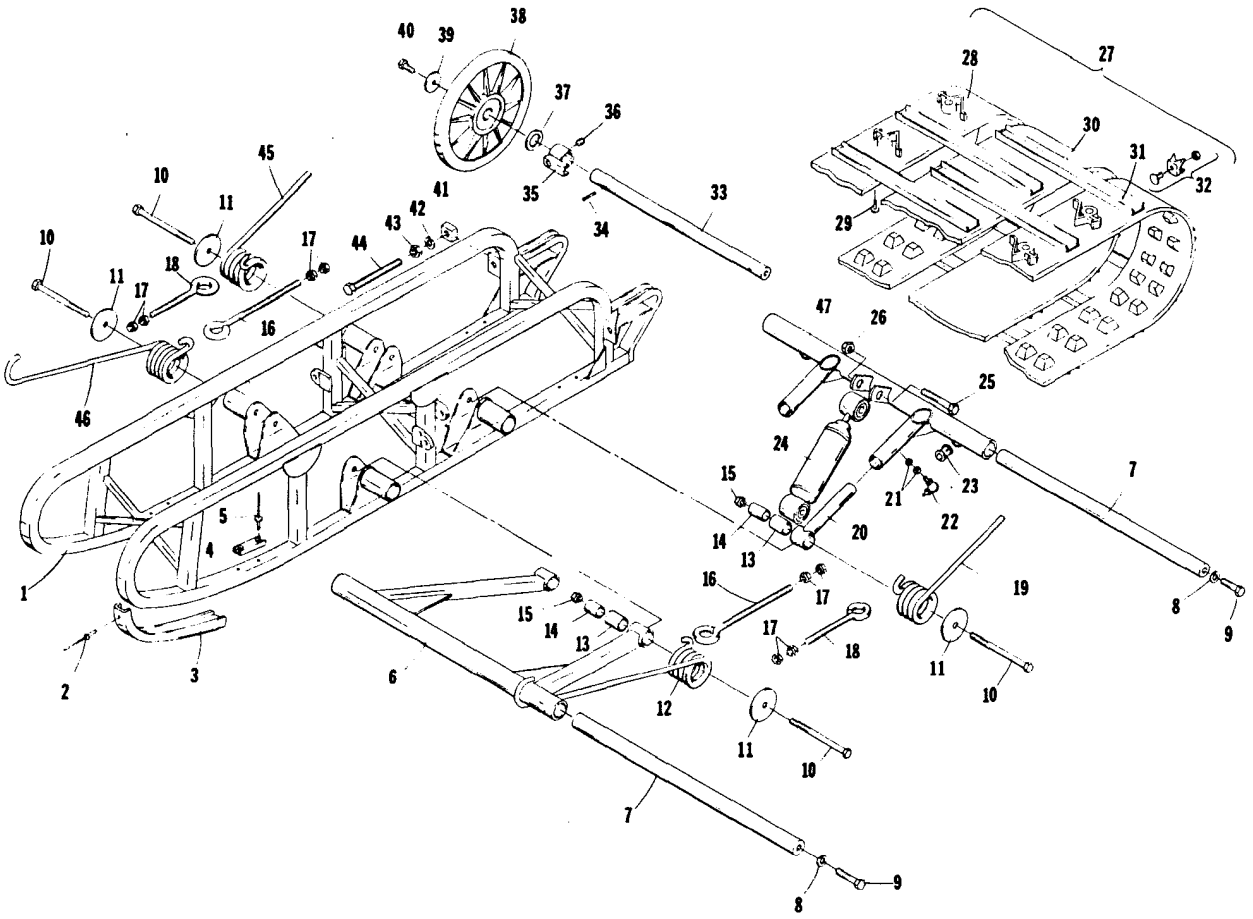
PANTERA FA



Ref. No.	Part No.	Qty.	Description	Ref. No.	Part No.	Qty.	Description
1	0104-767	2	Rail	35	0104-765	1	Axle, Rear Arm
2	8040-426	15	Nut, Lock	36	8050-212	3	Washer
3	0123-766	4	Nut, Push	37	0104-062	3	Zerk
4	0104-631	4	Pad, Shock	38	0104-790	1	Telescope, Rear Arm
5	0104-865	2	Strip, Wear	39	0104-751	1	Spring, Rear-Left
6	8002-132	4	Screw, Cap	40	2272-037	2	Eyebolt
7	0123-767	4	Rivet, Solid	41	8040-486	8	Nut, Lock
8	8002-131	10	Screw, Cap	42	0104-838	2	Plate/Nut, Weldment
9	8002-135	5	Screw, Cap	43	8042-486	2	Nut, Hex
10	8050-252	8	Washer	44	0123-703	2	Screw, Cap
11	8042-426	4	Nut	45	0123-439	2	Washer
12	0104-764	2	Slide, Spring	46	0103-099	4	Bushing
13	8041-426	4	Nut, Lock	47	0106-669	1	Shock Absorber
14	8070-285	8	Pin, Spring	48	8002-227	2	Screw, Cap
15	8012-132	2	Screw, Cap-Lock	49	0104-757	1	Arm, Rear
16	0104-784	2	Washer, Hex	50	0123-570	2	Washer
17	0104-785	2	Spacer	51	8012-192	2	Screw, Cap-Lock
18	0104-934	2	Wheel, Idler	52	0104-386	4	Bushing
19	0123-019	2	Washer	53	0104-750	1	Spring, Rear-Right
20	8012-130	2	Screw, Cap-Lock	54	0104-748	2	Axle
21	0104-756	1	Axle, Rear	55	0104-629	2	Spacer
22	0104-909	1	Housing, Rear Axle-Left	56	2272-056	2	Eyebolt
23	0104-908	1	Housing, Rear Axle-Right	57	0104-752	1	Spring, Front-Right
24	0102-232	1	Track Assy (Incl. 25-29)		0104-753	1	Spring, Front-Left
25	0102-200	2	Belt, Outer	58	0111-411	1	Arm, Front (Incl. 52)
26	0102-199	1	Belt, Center	59	8002-228	2	Screw, Cap
27	0123-729	416	Rivet, Solid	60	0104-759	1	Bracket, Front Arm
	0134-815	AR	Rivet, Threaded w/Nut (Pkg. 50)	61	0104-780	1	Stop, Front Arm
28	0102-202	48	Cleat, Channel	62	8002-048	1	Screw, Cap
29	0134-981	1	Ice Stud Kit-3 Point(Pkg.50)	63	8050-221	2	Washer
30	0104-837	2	Wheel, Idler	64	8040-366	1	Nut, Lock
31	0104-781	1	Axle, Idler	65	0104-777	1	Crossbrace, Front
32	0104-770	1	Spacer, Inside	66	0104-779	2	Roller, Spring
33	8051-277	10	Washer, Lock	67	0104-771	2	Spacer, Outside
34	8002-222	6	Screw, Cap	68	0123-149	4	Washer

Fig. 7-4

CHEETAH



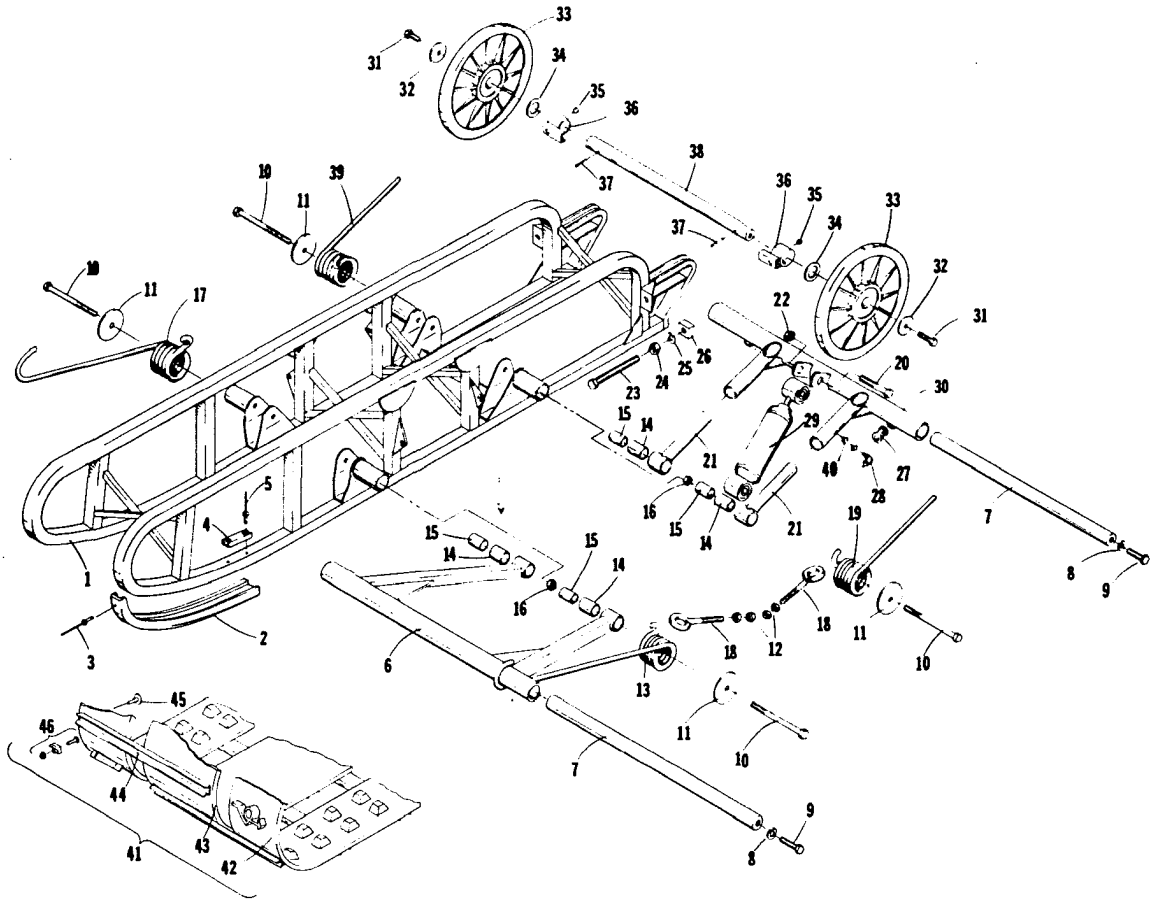
0700-168

0700-168

Ref. No.	Part No.	Qty.	Description	Ref. No.	Part No.	Qty.	Description
1	0104-338	1	Frame	25	8002-318	2	Screw, Cap
2	8060-488	34	Rivet	26	8040-546	2	Nut, Lock
3	0104-217	2	Hi-Fax	27	0102-253	1	Track Assy (Incl. 28-32)
4	0104-073	8	Pad	28	0102-157	2	Belt-Outer
5	0123-251	16	Rivet	29	0123-729	414	Rivet, Solid
6	0110-265	1	Front Arm		0134-815	AR	Rivet, Threaded w/Nut (Pkg. 50)
7	0104-562	2	Axle	30	0102-158	1	Belt-Center
8	8051-277	4	Washer, Lock	31	0102-086	46	Cleat, Channel
9	8002-222	4	Screw, Cap	32	0134-981	1	Ice Stud Kit-3 Point (Pkg. 50)
10	0123-032	4	Screw, Cap	33	0104-476	1	Axle, Rear
11	0123-020	4	Washer	34	8070-286	2	Pin, Spring
12	0104-032	1	Spring, Front-Left	35	0104-468	2	Spacer
13	0104-107	4	Bushing	36	8080-305	2	Screw, Set
14	0104-108	4	Pivot, Insert	37	0123-018	2	Washer
15	8040-516	4	Nut, Lock	38	0104-298	2	Wheel
16	2272-063	2	Eye Bolt	39	0123-019	2	Washer
17	8042-486	8	Nut	40	8012-130	2	Screw, Cap-Lock
18	2272-037	2	Eye Bolt	41	0123-356	2	Nut, Square
9	0104-195	1	Spring, Rear-Left	42	8051-302	2	Washer, Lock
J	0110-266	2	Inside Arm (Incl. 13)	43	8042-546	2	Nut
21	0123-205	4	Washer	44	0123-449	2	Screw, Cap
22	0123-627	2	Zerk, Grease	45	0104-194	1	Spring, Rear-Right
23	0104-092	2	Bushing	46	0104-033	1	Spring, Front-Right
24	0106-353	1	Shock Absorber	47	0104-192	1	Arm, Rear

Fig. 7-5

PANTHER

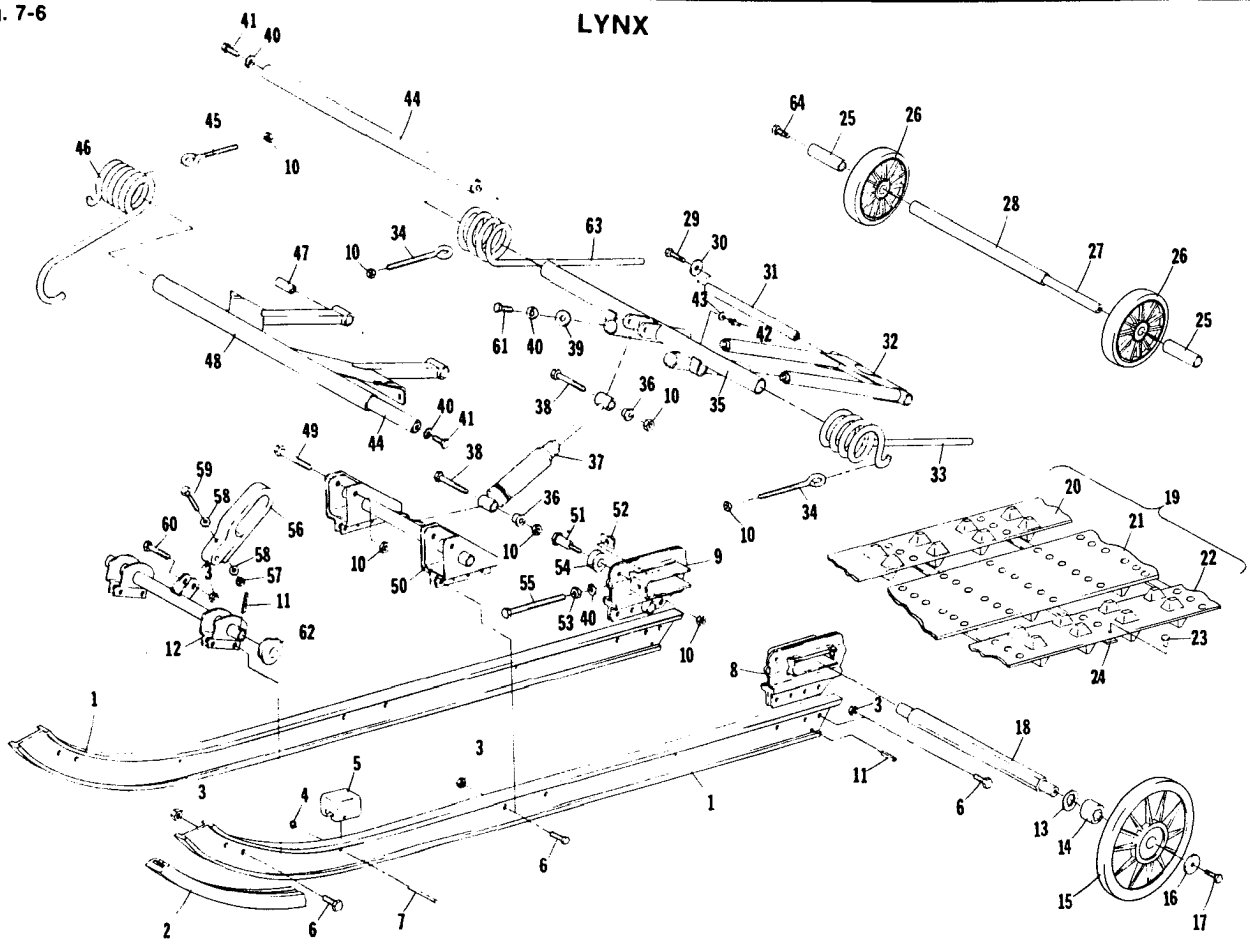


0700-167

Ref. No.	Part No.	Qty.	Description	Ref. No.	Part No.	Qty.	Description
1	0104-339	1	Frame	25	8051-302	2	Washer, Lock
2	0104-133	2	Hi-Fax	26	0123-356	2	Nut, Square
3	8060-488	36	Rivet	27	0104-092	2	Bushing
4	0104-073	8	Pad	28	0123-627	2	Grease Zerk
5	0123-251	16	Rivet	29	0106-353	1	Shock Absorber
6	0110-265	1	Front Arm	30	0104-192	1	Arm, Rear
7	0104-562	2	Axle	31	8012-130	2	Screw, Cap-Lock
8	8051-277	4	Washer, Lock	32	0123-019	2	Washer
9	8002-222	4	Screw, Cap	33	0104-298	2	Wheel
10	0123-032	4	Screw, Cap	34	0123-018	2	Washer
11	0123-020	4	Washer	35	8080-305	2	Set Screw
12	8042-486	8	Nut	36	0104-468	2	Spacer
13	0104-032	1	Spring, Front-Left	37	8070-286	2	Pin, Spring
14	0104-107	4	Bushing	38	0104-476	1	Axle, Rear
15	0104-108	4	Pivot, Insert	39	0104-194	1	Spring, Rear-Right
16	8040-516	4	Nut, Lock	40	0123-205	4	Washer
17	0104-033	1	Spring, Front-Right	41	0102-252	1	Track Assy (Incl. 42-46)
18	2272-037	4	Eye Bolt	42	0102-161	2	Track-Outer
19	0104-195	1	Spring, Rear-Left	43	0102-162	1	Track-Center
20	8002-318	2	Screw, Cap	44	0102-086	50	Cleat, Channel
21	0110-266	2	Inside Arm (Incl. 14)	45	0123-729	450	Rivet, Solid
22	8040-546	2	Nut, Lock		0134-815	1	Rivet, Threaded w/Nut (Pkg. 50)
23	0123-449	2	Screw, Cap	46	0134-981	1	Ice Stud Kit-3 Point (Pkg. 50)
24	8042-546	2	Nut				

Fig. 7-6

LYNX



0700-124

Ref. No.	Part No.	Qty.	Description	Ref. No.	Part No.	Qty.	Description
1	0104-929	2	Rail	33	0104-895	1	Spring, Rear-Left
2	0104-865	2	Strip, Wear	34	2272-063	2	Eyebolt
3	8040-426	13	Nut, Lock	35	0104-907	1	Arm, Rear
4	0123-766	4	Nut, Push	36	0103-099	4	Bushing
5	0104-631	4	Pad	37	0104-931	1	Shock Absorber
6	8002-131	12	Screw, Cap	38	8002-227	2	Screw, Cap
7	0123-767	4	Rivet, Solid	39	0123-570	2	Washer
8	0104-909	1	Housing, Axle-Left	40	8051-277	8	Washer, Lock
9	0104-908	1	Housing, Axle-Right	41	8002-222	4	Screw, Cap
10	8040-486	10	Nut, Lock	42	0104-062	3	Zerk
11	8070-285	6	Pin, Spring	43	8050-212	3	Washer
12	0104-910	1	Crossbrace, Front	44	0104-592	2	Axle, Inner
13	0104-784	2	Washer, Hex	45	2272-037	2	Eyebolt
14	0104-785	2	Spacer	46	0114-098	1	Spring, Front-Right
15	0104-403	2	Wheel		0114-099	1	Spring, Front-Left
16	0123-019	2	Washer	47	0104-629	2	Spacer
17	8012-130	2	Screw, Cap-Lock	48	0105-241	1	Front Arm
18	0104-756	1	Axle, Rear	49	8002-228	2	Screw, Cap
19	0110-998	1	Track Assy (Incl. 20-24)	50	0104-911	1	Bracket, Front Arm
20	0102-220	1	Belt-Right	51	0104-842	2	Bolt, Shoulder
21	0102-222	1	Belt-Center	52	0104-838	2	Plate/Nut-Weldment
22	0102-221	1	Belt-Left	53	8042-486	2	Nut, Hex
23	0123-729	396	Rivet, Solid	54	0104-922	2	Roller, Spring
	0134-815	AR	Rivet, Threaded w/Nut (Pkg. 50)	55	0123-703	2	Screw, Cap
24	0102-229	44	Cleat	56	0104-780	1	Stop, Front Arm
25	0104-914	2	Spacer, Outside	57	8040-366	1	Nut, Lock
26	0104-930	2	Wheel, Idler	58	8050-221	2	Washer
27	0104-926	1	Axle, Idler	59	8002-048	1	Screw, Cap
28	0104-916	1	Spacer, Axle-Inside	60	8002-135	1	Screw, Cap
	8012-132	2	Screw, Cap-Lock	61	8012-192	2	Screw, Cap-Lock
	0123-439	2	Washer	62	0104-779	2	Roller, Front Spring
31	0104-765	1	Axle, Rear	63	0104-894	1	Spring, Rear-Right
32	0104-790	1	Telescope, Rear Arm	64	8012-220	2	Screw, Cap-Lock

Remove Skid Frame

Pantera FC

1. With the snowmobile on the shop floor, remove the suspension spring from the adjustment cam using the suspension spring tool.
2. Remove the two (2) cap screws securing the upper axle; then remove the upper axle.

NOTE: Removing upper axle is not necessary but will aid in ease of installation.

3. Remove the four (4) cap screws securing the skid frame to the tunnel.
4. Tip the snowmobile on its side. Use a piece of cardboard to protect against scratching.
5. Remove the skid frame.

Pantera FA and Lynx

1. With the snowmobile on the shop floor, remove the two (2) cap screws securing the upper axle.

NOTE: Removing the upper axle is not necessary but will aid in ease of installation.

2. Remove the four (4) lock nuts securing the eyebolts to the suspension springs.
3. Remove the four (4) cap screws securing the skid frame to the tunnel.
4. Tip the snowmobile on its side. Use a piece of cardboard to protect against scratching.
5. Remove the skid frame.

Panther, Cheetah and Jag

1. With the snowmobile on the shop floor, remove the four (4) cap screws that secure the skid frame to the tunnel.
2. Tip the snowmobile on its side; use a piece of cardboard to protect against scratching.
3. Remove the skid frame from within the track.
4. Slide the axles out of front and rear arms.

Disassemble Skid Frame

Remove Hi-Fax

NOTE: Examine hi-fax slides for wear, cracks and deterioration. If condition dictates, replace the hi-fax.

Pantera and Lynx

The Pantera and Lynx use an extruded rail of aluminum alloy. The rail allows fast hi-fax replacement.

1. Drive the spring pins out of the hi-fax and skid frame rails (two pins in front, one in the rear).
2. Using a hammer and a piece of wood, drive the hi-fax toward the rear of the skid frame.

NOTE: Be sure that the skid frame rails are not accidentally damaged or nicked.

Panther, Cheetah and Jag

1. Set skid frame on a clean working surface; hi-fax slides must face upward.
2. Remove rivets that secure hi-fax slides to skid frame rails using an air tool with 1/2-inch chisel. As an alternative, use hammer and a 1/2-inch chisel.

NOTE: When removing rivets that secure hi-fax slides to skid frame, start at rear of hi-fax and work forward.

3. Remove all rivet ends from skid frame. DO NOT ELONGATE HOLES IN SKID FRAME RAILS.

Remove Front Arm

CAUTION

DO NOT accidentally damage hi-fax slides when servicing skid frame. Accidental damage that is undetected will cause accelerated hi-fax wear and possible track deterioration.

Pantera

1. Set the skid frame on a clean working surface; hi-fax to contact working surface.
2. On Pantera FC, remove lock nuts from spring eyebolts.
3. Remove cap screws and lock nuts securing front arm to back arm bracket.
4. Remove the cap screw and lock nut securing front arm stop to front crossbrace.
5. Remove the cap screw, washer and lock nut securing front arm stop to front arm.
6. Remove front arm, front arm stop and spacers from the skid frame.

Panther, Cheetah and Jag

1. Set the skid frame on a clean working surface; hi-fax to contact working surface.
2. Remove nuts that secure eyebolts to skid frame mounting flanges. Repeat this step on opposite side eyebolt.
3. Remove eyebolts from front springs.
4. Remove cap screws, large washers and lock nuts that secure front arm and springs to skid frame pivot mounts.
5. Slide springs off front arm and skid frame pivot mounts.
6. Rotate front arm to the side and remove.

NOTE: Account for two (2) bushings located in front arm pivot points.

Lyr

1. Set the skid frame on a clean working surface; hi-fax to contact working surface.
2. Loosen and remove the lock nuts securing the suspension eyebolts to the front arm; then remove the eyebolts.
3. Remove the lock nut and cap screw securing the front arm stop to the front crossbrace.
4. Slide the suspension springs off the front arm. Remove the spacers from the pivot points of the arm.
5. Remove the cap screw and lock nut securing each side of front arm to front arm bracket; then remove the front arm.

Remove Rear Arm

Pantera and Lynx

1. Remove the cap screw and lock nut securing stationary end of shock absorber to the front arm bracket. Also, remove the cap screw, lock washer and flat washer from the ends of rear arm telescopes.
2. Slide the rear arm off the rear arm telescopes.

NOTE: On the Pantera FA and Lynx, remove the cap screw and lock nut securing moveable end of shock absorber if the shock is to be removed. On the Pantera FC model, remove the hair pin and shock pin.

Panther, Cheetah and Jag

1. Remove lock nut and cap screw securing shock absorber to rear arm.
2. Remove the nut securing eyebolt to eyebolt mounting flange. Repeat this step on opposite side eyebolt.
3. Remove eyebolts from rear springs.
4. Remove cap screws, large flat washers and lock nuts securing the rear arm and springs to rear arm mounts.
5. Pull rear arm until spring ends slide out of mounting holes; then slide springs off pivot mounts.
6. Remove rear arm.

NOTE: Account for two (2) bushings and pivot inserts located in rear arm pivot points.

Remove Rear Idler Wheels and Axle

NOTE: If rear idler wheel is damaged and must be replaced, install two (2) new idler wheels. Using one worn and one new idler wheel may cause track problems.

Pantera and Lynx

1. Remove cap screw and flat washer securing idler wheel to rear axle.
2. Slide the rear idler wheel, spacer and hex washer off rear axle.
3. Remove the wheel, spacer and hex washer from opposite side of skid frame. At this time, the rear axle may be pushed through the rear axle housing.

Panther, Cheetah and Jag

1. Loosen idler wheel adjusting bolts.

NOTE: If skid frame is damaged and replacement is necessary, remove the two (2) idler wheel adjusting bolts, hex nuts, lock washers and square nuts.

2. Remove cap screws and flat washers securing idler wheels to axle.
3. Slide rear idler wheel and large flat washer off each end of axle.

NOTE: It may be necessary to tap center hub before rear idler wheel will slide off axle.

4. Remove drive pins from axle.
5. Remove set screws from spacer.
6. Drive out rear axle.
7. When axle is removed, account for the two (2) spacers.
8. Skid frame is completely disassembled at this time. Proceed to Cleaning and Components and Inspecting Components.

Remove Rear Arm Telescope

Pantera and Lynx

1. Remove the lock nuts securing rear spring slides or rollers to the skid frame; then remove slides or rollers.
2. Remove the cap screws and lock nuts securing rear of axle housing to the skid frame.
3. Remove the cap screws securing rear arm telescope axle.
4. Slide the rear axle housings and rear arm telescope toward the rear of the skid frame until the assembly is clear of rails.
5. Slide the rear axle housings off the telescope arm axle; then slide flat washers off axle.
6. Slide the telescope out of the telescope arm shaft.
7. Remove the rear axle adjustment cap screw, jam nut, lock washer and plate/nut from the rear axle housing.

Remove Skid Frame Rails

Pantera and Lynx

1. Remove the clips and solid rivet pins securing shock pads to the skid frame rails; then remove pads.
2. Remove the cap screws and lock nuts securing the front crossbrace, the front arm bracket and shock mounting bracket (Pantera only) to the rails. Remove front arm bracket and shock mounting bracket from the rails.
3. Skid frame is completely disassembled at this time. Proceed to Cleaning Components and Inspecting Components.

Cleaning Components

1. Wash entire skid frame with soap and water; then dry thoroughly.
2. Touch up all rusted and chipped paint surfaces; sand affected areas before painting.
3. Remove spacers and bushings from front arm; clean arm, spacers and bushings with a cleaning solvent. Dry components thoroughly with compressed air.

4. On the Pantera and Lynx models, remove the axle from the rear telescope shaft. Clean shaft and axle with cleaning solvent. Dry components thoroughly with compressed air.

5 Clean rear arm, sliding ends and bushings with cleaning solvent. Check rear arm spring bushings for wear and deterioration. Dry components thoroughly with compressed air.

6. Wash remaining metallic components in cleaning solution and dry thoroughly with compressed air.

7. Wash any plastic components in soap and water only; then dry thoroughly.

NOTE: Cleaning solvent may damage non-ferrous parts.

Inspecting Components

NOTE: Whenever a part is worn excessively, cracked, defective or damaged in any way, replacement is necessary.

1. Inspect all threaded components for stripped threads.

2. Inspect all bushings and corresponding pivot areas for cracks, defects or wear.

3. Inspect wheels for any damage. Bearings must rotate freely. Replace both wheels if damage or wear is evident.

4. Be sure rear axle and inner axles are straight.

5. Inspect all springs for abnormal bends or cracks.

6. Inspect the eyebolt for separation of the eye or abnormal bends.

7. Inspect eyebolt mounting flanges on the chassis or skid frame. Repair any damage that exists.

8. Inspect the entire skid frame. No unusual bend is to be evident in the skid frame.

Assemble Skid Frame

NOTE: Make sure skid frame and related components are clean and have been inspected for wear, defects and damage.

Install Hi-Fax

Pantera and Lynx

1. Apply a fine spray of lubricant along the groove of the hi-fax.

2. Start sliding the hi-fax into position starting from the rear of the skid frame.

3. Continue to slide hi-fax until front edge of hi-fax is flush with front end of rails.

4. Secure hi-fax with front and rear spring pins.

Panther, Cheetah and Jag

1. When attempting to install hi-fax slides on skid frame rail, make sure hi-fax is at room temperature (20°C, +68°F.).

2. Install new hi-fax in first hole at curved end of skid frame using a pop rivet and rivet gun.

3. Continue to secure hi-fax to end of skid frame rail; then cut off any excess with a hacksaw. Install hi-fax slide on the adjacent rail.

Install Skid Frame Rail

Pantera and Lynx

1. Move the front crossbrace and shock mounting bracket (Pantera only) into position.

NOTE: Front arm stop bracket is to face the rear of the skid frame.

2. Secure the front crossbrace and the front arm bracket to the rail with cap screws and lock nuts. Tighten to 1.8 kg-m or 13 ft-lb.

NOTE: Shock mount must be positioned to the rear of the front arm bracket.

3. Place the shock pads in position on the skid frame rails; then secure with the solid rivet pins and push nuts.

Install Rear Arm Telescope

Pantera and Lynx

1. Apply low temperature grease on the rear arm axle and the rear arm telescope; then insert axle into the rear arm telescope. Place flat washer on each end of axle.

2. Slide the rear axle housings and rear arm telescope into place on the skid frame rails.

3. Install cap screws and lock nuts in the rear holes of the rear axle housings. DO NOT tighten the lock nuts at this time.

4. Install the cap screws which secure the rear arm axle in position. DO NOT tighten.

5. Install cap screws and washers which secure rear spring slides in the remaining holes of the rear axle housings.

NOTE: Heads of cap screws must be positioned to the inside of skid frame.

6. Install the lock nuts and tighten to 1.8 kg-m or 13 ft-lb; then place the rear spring slides in position over bolts.

7. Install the lock nuts and secure to 1.8 kg-m or 13 ft-lb.

Install Rear Idler Wheels and Axle

Pantera and Lynx

1. Slide axle into position between the rear axle housings.

2. On each end of the rear axle, slide a hex washer and a plastic spacer.

3. Apply low temperature grease on the axle; then slide the idler wheels in position. Secure the wheels with a cap screw and a flat washer. Tighten the cap screws to 1.8 kg-m or 13 ft-lb.

4. If track tension adjusting bolts were removed during disassembly, install with jam nuts and lock washers. Insert the tension bolts in the axle housings, then install the nut/plates in the axle slot of the housings. Make sure the plate portion faces the front of the skid frame.

Panther, Cheetah and Jag

1. If removed during disassembly, install idler wheel adjusting bolts, hex nuts, lock washers and square nuts on the skid frame mounting flange.

NOTE: Adjusting bolts are to extend through the square nuts about 1/4-inch.

2. Slide idler wheel axle between skid frame axle slides.

3. Slide spacers onto idler wheel axle, making sure that spacer extension is toward the center of skid frame (between skid frame axle slides).

4. Seat the spacers against the axle slides. Measure distance from outside edge of spacers to end of idler wheel axle. Correct measurement is when spacers are equidistant from axle ends.

5. When correct measurement is obtained, tighten both spacer set screws.

6. Using a hammer and punch, install the drive pin in each end of idler wheel axle.

7. Place a large flat washer on the idler wheel axle; then install idler wheel.

8. Secure rear idler wheel to axle with cap screw and flat washer. Tighten to 1.8 kg-m or 13 ft-lb.

NOTE: Position the idler wheel in such a manner that the large diameter insert of the wheel is to the inside of the skid frame.

9. Repeat steps 7 and 8 on opposite end of idler wheel axle.

Install Rear Arm

Pantera and Lynx

1. Slide the rear arm onto the rear arm telescope.

NOTE: Make sure the rear arm does not bind on the rear arm telescopes. Also, make sure that the rear arm shock bracket is facing toward the front of the skid frame.

2. Install the cap screw, lock washer and flat washer on the ends of the rear arm telescope. Tighten the cap screws to 3.2 kg-m or 23 ft-lb.

3. Place the moveable end of the shock absorber into position on the rear arm.

4. On the Pantera FA and Lynx, secure the shock absorber with a cap screw and lock nut. Tighten to 3.2 kg-m or 23 ft-lb. On the Pantera FC, secure the shock absorber with the shock pin and hair pin.

5. If stationary end of shock absorber has been disconnected, install the shock absorber, cap screw and lock nut at this time. Tighten to 3.2 kg-m or 23 ft-lb.

Panther, Cheetah and Jag

1. Install stationary end of shock absorber in the skid frame cross member mount and secure with cap screw and lock nut. Tighten to 3.2 kg-m or 23 ft-lb.

2. Install rear arm slides into rear arm and insert bushings into both rear arm slide pivot points.

3. Position rear arm assembly on inside of skid frame and allow rear arm pivot points to slide between pivot mounts on the skid frame.

NOTE: Make sure that the rear arm shock mounting bracket faces upward. This position of shock mounting bracket is necessary for correct shock absorber installation.

4. Slide rear arm springs onto the spring pivot mounts. Pull rear arm backward until spring ends can be slid into rear arm bushing holes; then push rear arm forward.

5. Secure the spring and rear arm to the skid frame with cap screw, large flat washer and lock nut. Tighten lock nut to 3.2 kg-m or 23 ft-lb. Repeat this step on opposite side.

6. Thread a nut halfway onto eyebolt and slide eyebolt onto hooked end of rear spring. Perform this step on remaining eyebolt.

7. Slide eyebolts through the mounting flanges on the skid frame; then install nuts on eyebolts.

8. Secure shock absorber to rear arm with a cap screw and lock nut. Tighten lock nut to 3.2 kg-m or 23 ft-lb.

9. Tighten eyebolt adjusting nut so approximately 5/8-inch of eyebolt extends through the nut. Lock adjustment in place by "bottoming" jam nut against eyebolt mounting flange. Perform this step on opposite side eyebolt.

NOTE: Be sure both eyebolts are adjusted equally.

10. Lubricate the rear arm with low temperature grease (Texaco 2346 EP or equivalent). Two or three pumps on the grease gun handle will provide proper lubrication.

Install Front Arm

Pantera and Lynx

1. Move the front arm bushings into position in the front arm pivot holes.

NOTE: Place low temperature grease on the bushings and spacers before installation.

2. Move the front arm into position and secure to pivot points with cap screws and lock nuts. Tighten the lock nuts to 3.2 kg-m or 23 ft-lb.

3. Install the front arm stop on the front arm; then secure with a cap screw, washer and lock nut. Tighten the lock nut securely.

4. Move the front arm stop into position on the front crossbrace. Secure with a cap screw and lock nut. Tighten the cap screw and lock nut.

NOTE: If the lock nut is overtightened, the front arm stop will not rotate.

5. At this time, lubricate the three grease fittings on the rear arm telescopes of the skid frame.

NOTE: Lack of lubrication will cause poor ride. Be sure to periodically lubricate the the rear arm telescope.

6. Place the front suspension springs in position on the front arm; then hook the end of the eyebolts on the suspension springs.

7. Insert the threaded portion of the eyebolt through the flange on the front arm; then install a lock nut on each eyebolt. Tighten each eyebolt equally.

Panther, Cheetah and Jag

1. Insert bushings into front arm pivot points.

2. Position front arm on skid frame and allow front arm pivot points to slide between front arm pivot mounts.

3. Slide springs onto front arm and spring pivot mounts.

NOTE: Eyebolt end of spring is to face inward.

4. Secure spring and front arm to skid frame with a cap screw, large flat washer and lock nut. Tighten lock nut to 3.2 kg-m or 23 ft-lb. Perform this step on opposite side of skid frame.

5. Thread a nut halfway onto eyebolt and slide eyebolt onto hooked end of front spring. Perform this step on remaining eyebolt.

6. Slide both eyebolt ends through mounting flanges on the skid frame. Hold components in place and install nuts on eyebolts.

7. Tighten eyebolt adjusting nut so that approximately 1/2-inch of eyebolt extends through the nut. Lock adjustment in place by "bottoming" jam nut against eyebolt mounting flange. Perform this step on opposite side eyebolt.

NOTE: Make sure both eyebolts are adjusted equally.

Install Skid Frame

Pantera FC

1. Spread a light coat of low temperature grease (Texaco 2346 EP or equivalent) on the front and rear skid frame mounting axles.

2. Tip snowmobile onto its side and use a piece of cardboard to protect against scratching.

3. Pull track away from tunnel and install skid frame. Slide axles through arms of skid frame.

4. Move front arm of skid frame into position with front mounting hole in tunnel. Slide lock washer onto cap screw and secure front arm to tunnel. DO NOT TIGHTEN CAP SCREW; THREAD IN HALFWAY.

NOTE: To aid in centering front arm of skid frame with holes in tunnel, position skid frame and track at a 45° angle to bottom of tunnel.

5. Push skid frame and track into tunnel. Tip snowmobile onto opposite side and use a piece of cardboard to protect against scratching.

6. Secure front arm to tunnel following directions given in step 4.

7. Move rear arm of skid frame into position with rear mounting holes in body tunnel. Slide lock washer onto cap screw and secure rear arm to tunnel. DO NOT TIGHTEN CAP SCREW; THREAD IN HALFWAY.

NOTE: Rear arm of skid frame may not align with mounting holes in tunnel. To obtain proper alignment of rear arm and mounting holes, use a soft mallet and drive the rear arm in the proper direction until alignment is obtained.

8. If removed, align upper axle with mounting holes in tunnel. Secure axle with lock washer and cap screw. DO NOT TIGHTEN CAP SCREW; THREAD IN HALFWAY.

9. Tip snowmobile onto opposite side and use a piece of cardboard to protect against scratching.

10. Slide lock washer onto cap screw and secure rear arm to tunnel; then secure upper axle. Tip snowmobile upright.

11. Tighten upper axle, front and rear arm mounting cap screws to 3.2 kg-m or 23 ft-lb.

12. Align the rear suspension spring with the rear spring roller. Secure suspension spring on adjustment cam using suspension spring tool. Repeat process on opposite side suspension spring. Adjust both sides equally.

Pantera FA and Lynx

1. Apply low temperature grease (Texaco 2346 EP or equivalent) on the front and rear skid frame mounting axles.

2. Tip snowmobile onto its side and use a piece of cardboard to protect against scratching.

3. Pull track away from tunnel and install skid frame. Slide axles through front and rear arms of the skid frame.

4. Move front arm of skid frame into position with front mounting hole in the body tunnel. Slide lock washer onto cap screw and secure front arm to tunnel. DO NOT TIGHTEN CAP SCREW; THREAD IN HALFWAY.

NOTE: To aid in centering front arm of skid frames with holes in tunnel, position skid frame and track at a 45° angle to bottom of tunnel.

5. Push skid frame and track up into the tunnel. Tip snowmobile onto opposite side and use a piece of cardboard to protect against scratching.

6. Secure front arm to tunnel using directions given in step 4.

7. Move rear arm of skid frame into position with rear mounting holes in body tunnel. Slide lock washer onto cap screw and secure rear arm to tunnel. DO NOT TIGHTEN CAP SCREW; THREAD IN HALFWAY.

NOTE: Rear of skid frame may not align with mounting holes in tunnel. To obtain proper alignment of rear arm and mounting holes, use a soft mallet and drive the rear arm in the proper direction until alignment is obtained.

8. If removed, align upper axle with mounting holes in tunnel. Secure axle with lock washer and cap screw. DO NOT TIGHTEN CAP SCREW; THREAD IN HALFWAY.

9. Tip snowmobile onto opposite side and use a piece of cardboard to protect against scratching.

   Slide lock washer onto cap screw and secure rear arm to tunnel; then secure upper axle.

11. Tighten upper axle, front and rear arm mounting cap screws to 3.2 kg-m or 23 ft-lb.

12. On the Pantera FA, secure the front suspension springs to the tunnel using 4-inch eyebolts.

13. On the Lynx and Pantera FA, secure the rear suspension springs to the tunnel using 5-5/8 inch eyebolts on the Pantera and 6-5/16 inch eyebolts on the Lynx.

14. Tip snowmobile upright.

Adjustment

Track Tension

1. Lubricate the rear suspension grease fittings.

2. Check to be sure rear idler wheels are positioned between internal drive lugs.

⚠ WARNING ⚠

Shut engine off and make sure ignition switch is in the OFF position. Personal injury could result if this warning is ignored.

3. Using a jack or hoist, raise the rear of the snowmobile off the shop floor.

4. Press down on track at midspan and measure distance between bottom of hi-fax slides and inside surface of track using a tape measure. Desired distance is between 1-1/4 - 1-1/2 inches on the Pantera and Panther. On the Cheetah, Jag and Lynx, the desired distance is 3/4-1 inch.

5. If measurement is not as specified for the model, loosen idler wheel adjusting bolt jam nut. Back jam nut off until it is approximately 1/2-inch away from the adjusting bolt head. Perform this step on opposite side jam nut.

6. If measurement obtained in step 4 is more than as specified, tighten adjusting bolts. If measurement obtained is less than specified, loosen adjusting bolts. When measurement is within tolerance, lock adjustment in place by bottoming jam nut against skid frame.

NOTE: An excellent check at this time would be to slide your hand along the inside of the tunnel and vigorously push underside of track up and down. Track must not hit top of tunnel or slap on the skid frame.

7. After correct track tension is obtained, check track alignment.

NOTE: Track tension and track alignment are interrelated; always perform both adjustments even if only one adjustment seems necessary. Always establish correct track tension before checking and/or adjusting track alignment.

Track Alignment

Proper track alignment is obtained when rear idler wheels are equidistant from inside edge of internal drive lugs. An alternate method involves the centering of the hi-fax in the drive sprocket cutout of the track.

⚠ WARNING ⚠

Shut engine off and make sure ignition switch is in the OFF position. DO NOT allow anyone to stand in front of or to the rear of the snowmobile when checking track alignment. Personal injury or bystander injury may result if this warning is ignored.

1. Make sure both rear idler wheels are positioned between internal drive lugs.

2. Using a safety stand, raise rear of snowmobile until track is completely off the shop floor and free to rotate. Skis are to be placed against a wall or other stationary object.

3. Start engine, accelerate slightly to turn the track several revolutions and SHUT ENGINE OFF (ignition switch in OFF position). Note to which side track has run.

NOTE: Allow track to coast to a stop when checking alignment. DO NOT apply brake as this may produce an inaccurate alignment condition.

4. If track runs to left or right and rubs against inside surface of internal drive lugs, loosen idler wheel adjusting bolt jam nut. Back jam nut off until it is approximately 1/2-inch away from adjusting bolt head. Perform this step on opposite side jam nut.

5. Rotate adjusting bolts clockwise or counterclockwise until proper alignment is established. If track runs to right, tighten right side bolt. If track runs to the left, tighten the left side bolt. Make sure proper track tension is maintained. Bottom jam nuts against skid frame.

NOTE: After jam nuts are bottomed against the skid frame, an equal length of bolt is to extend back from the jam nut to the bolt head. This relationship in itself will help to ensure proper track alignment.

6. When adjustment is complete, lower rear of snowmobile, start engine and test run under actual operating conditions.

7. After test run is completed, recheck track alignment and adjust if necessary.

NOTE: Make sure correct track tension is maintained when alignment is adjusted.

Suspension

The suspension is to be set for the operator only. The rear springs should be adjusted to suit the weight and riding preference of the operator. Also, the rear springs should be adjusted to accommodate the weight of an additional passenger when two people are riding. The front spring adjustment primarily influences the way the snowmobile performs in snow and the effort required to steer the snowmobile.

The optimum setting of the rear springs prevents the suspension from "bottoming out" on most bumps. The springs should not, however, be set so stiff to prevent the suspension from working properly under normal riding conditions.

A good test of a properly adjusted suspension is the operator should just be able to "bottom" the suspension when jumping up and down on the rearmost part of the running board.

The optimum setting for the front spring is when spring tension is sufficiently stiff to prevent the suspension from collapsing in deep snow but not so stiff that steering becomes ineffective.

NOTE: Maintain equal suspension adjustment on both sides of the skid frame.

Rear Spring Adjustment

Pantera FA and Lynx

The front eyebolts on the Pantera and Lynx and the rear eyebolts on the Pantera FA and Lynx are equipped with self-locking nuts. Tighten or loosen the spring adjusting nut to obtain the desired suspension adjustment. Make the same adjustment on the opposite side eyebolt. Be sure adjustment is equal on both springs.

Pantera FC

Rear spring tension is adjusted by a four position adjuster cam mounted on the tunnel. Spring tension can be changed by rotating the cam using the handle from the spark plug wrench in the tool kit. To increase spring tension, the handle should be rotated toward the rear of the snowmobile. To decrease spring tension, rotate the handle toward the front of the machine. Be sure both cams are adjusted equally.

CAUTION

Damage to the cam will result if the cam is rotated directly from the low to high position.

Panther, Cheetah and Jag

1. Back jam nut away from front or rear eyebolt mounting flange. Perform this step on opposite side.
2. Tighten or loosen adjusting nut to obtain desired suspension adjustment. Perform this step on opposite side.
3. When desired tension is obtained, lock adjustment by bottoming jam nut against eyebolt mounting flange. Perform this step on opposite side.

SECTION 8 — ELECTRICAL SYSTEM

TABLE OF CONTENTS

IGNITION SYSTEM SPECIFICATIONS

ITEM	PANTERA FC	PANTERA FA	PANTHER 4000	PAN/CHE 5000	JAG 2000	JAG 3000	LYNX T	LYNX T	LYNX S
Ignition Type	Nippon Denso CDI	Kokusan CDI	Nippon Denso CDI	Nippen Denso CDI	Kokusan CDI	Kokusan CDI	Kokusan CDI	Nippon Denso CDI	Nippon Denso Breaker Point
Volt/Watt	12/150	12/120	12/150	12/150	12/120	12/120	12/120	12/120	12/120
Ignition Timing –Degree BTDC –mm BTDC –in. BTDC	 18°@6000 2.02 0.080	 20°@6000 2.49 0.098	 18°@6000 2.02 0.080	 18°@6000 2.02 0.080	 16°@6000 1.44 0.056	 16°@6000 1.44 0.056	 16°@6000 1.44 0.056	 18°@6000 1.86 0.073	 22°@6000 3.00 0.118
Spark Plug-Std.	BR9ES NGK	BR9ES NGK	BR8ES NGK	BR9ES NGK	BR8ES NGK	BR8ES NGK	BR8ES NGK	BR8ES NGK	BR9ES NGK
Spark Plug Gap (mm) (in.)	0.5 0.020	0.5 0.020	0.5 0.020	0.5 0.020	0.5 0.020	0.5 0.020	0.5 0.020	0.5 0.020	0.5 0.020
Plug Cap Resistance - ohms	5k	10k	5k	5k	5k	5k	5k	10k	10k
Ignition Coil – Primary Resistance (ohm) – Secondary Resistance (ohms)	 0.3 1.4k	 0.23 1.4k	 0.3 1.4k	 0.3 1.4k	 0.22 5.8k	 0.22 5.8k	 0.22 5.8k	 0.22 5.8k	 0.9 7.6k
Charge/Trigger Coil Resistance (ohms)	Charge 200 Trigger 32	Charge 127 Trigger 31	Charge 200 Trigger 32	Charge 200 Trigger 32	Charge 127 Trigger 44	Charge 127 Trigger 44	Charge 127 Trigger 44	Charge 127 Trigger 44	3.82 Excitor
Lighting Coil Resistance (ohm)	0.17	0.18	0.17	0.17	0.18	0.18	0.18	0.18	0.14
Condenser Capacity	–	–	–	–	–	–	–	–	0.3 micro farad
Condensor Series Resistance	–	–	–	–	–	–	–	–	Less than 1 ohm
Condenser Leakage	–	–	–	–	–	–	–	–	20 megohms

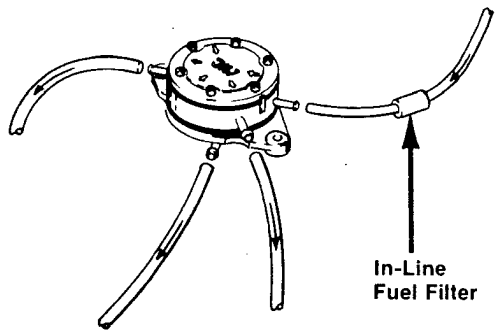
Ignition System Test Procedure

Oftentimes, the fuel system will not be functioning properly and, as a result, the service technician may be led to believe there is a problem in the ignition system. Therefore, before the ignition system is considered to be malfunctioning, check the fuel system to make sure the engine is getting fuel.

1. Check fuel tank for fuel; remove cap and visually check.

2. Check in-line fuel filter. If filter is dirty, clean or replace.

Fig. 8-1



0725-067

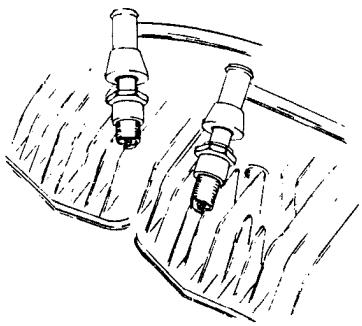
3. Check fuel delivery to the engine. This can be determined by using a squirt can filled with a gas/oil mixture. If engine will not start, squirt two or three bursts of fuel into the carburetor bore. Make sure all switches are in the "ON" position. Start engine. If engine runs and then stops, the carburetor is not delivering fuel. If the engine does not at all respond, proceed to step 4.

4. Remove spark plugs and visually check condition. Replace any fouled plug. Attach spark plugs to spark plug wires and lay on the cylinder heads so they are grounded (Fig. 8-2). Make sure all switches are in the "ON" position.

NOTE: NEVER crank the engine over without first checking to be sure both plug wires are grounded. Damage to the coil and CDI Unit may result.

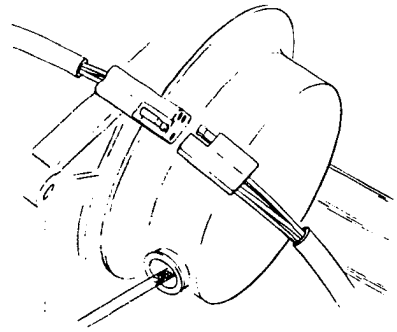
5. Grasp recoil and crank engine over quickly. Check spark plugs for spark. If no spark is seen, disconnect the main wiring harness from the engine. Now pull recoil rope several times. If there is now spark, the wiring harness or switches are defective. To check wiring harness and switches, proceed to wiring harness test procedure. If there is still no spark, the problem is in the engine ignition system. To check ignition system, proceed to High Voltage Output Test.

Fig. 8-2



0725-134

Fig. 8-3



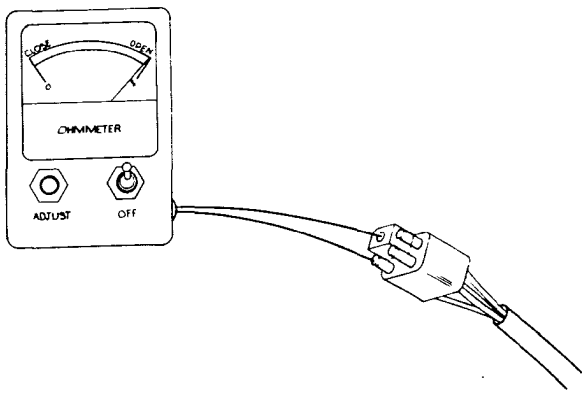
0725-135

Wiring Harness Test Procedure

1. Throttle cables must be synchronized so throttle safety switch is tensioned.

2. Connect one ohmmeter lead to the black lead in the main harness at the engine connector. Attach the other lead of the meter to the double brown wire connection in the same connector.

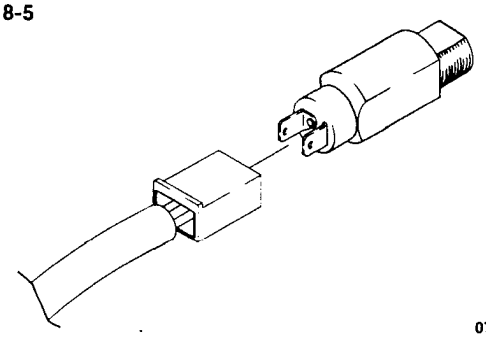
Fig. 8-4



0725-136

3. With both the ignition switch and safety switch in the "ON" position, the meter must register "OPEN". If tester reads "CLOSED", disconnect the ignition switch connector. If the meter now reads "OPEN", the ignition switch is bad and must be replaced.

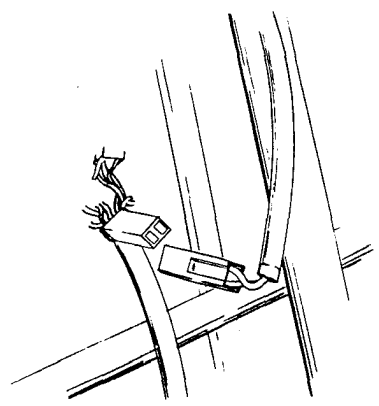
Fig. 8-5



0725-704

4. If meter reads "CLOSED" with the ignition switch unplugged, then go to the safety stop switch and disconnect it. If the meter reads "OPEN", the safety switch must be replaced. If the circuit is still closed with both switches disconnected, replace the harness. After the problem has been located and corrected, place machine on a test stand and make sure all safety switches are working.

Fig. 8-6



0725-138

Test Ignition Systems

To test the ignition system on the Spirit engines, a service technician must have a CDI tester and a trigger pulse simulator. Shops having only the CDI tester (same as last year) will have to order the trigger pulse simulator. If the service technician does not have either, a new tester is available which incorporates both testers into one. The testers are not available from Arctic but can be ordered directly from the manufacturer:

Electro-Specialities, Inc.
11225 W. Bluemound Road
Wauwatosa, WI 53226

With these testers, a complete ignition check can be made on the Spirit engines in just a few minutes. To completely check the system, the following procedure is to be used. If the engine fails because of lack of spark, check the output of the external coils first.

Ignition Systems

The 1978 Arctic Cat snowmobiles use five different ignition systems. The various systems are engineered to produce the optimum performance and durability for each model. The service manual covers complete service information for each of the systems. Refer to the chart below for a description of the system used on the different model snowmobiles. Refer to the pages listed for service information and troubleshooting procedures.

Model	Ignition Type	Manufacturer	Volt/Watt	Page of Service Info.
2000S Lynx	Magneto Point	Nippon Denso	12/120	132-134
2000T Lynx*	Magneto CDI	Nippon Denso	12/120	134-137
)0T Lynx*	Magneto CDI	Kokusan	12/120	137-140
2000 Jag	Magneto CDI	Kokusan	12/120	137-140
3000 Jag	Magneto CDI	Kokusan	12/120	137-140
4000 Panther	Magneto CDI	Nippon Denso	12/150	143-148
5000 Panther	Magneto CDI	Nippon Denso	12/150	143-148
5000 Cheetah	Magneto CDI	Nippon Denso	12/150	143-148
5000 Pantera FA	Magneto CDI	Kokusan	12/120	140-143
5000 Pantera FC	Magneto CDI	Nippon Denso	12/150	143-148

*The 1978 Lynx 2000T models will be equipped with either Kokusan or Nippon Denso systems. To determine which system is used, examine the CDI unit. The Nippon Denso system is identified by the ND on the unit; the Kokusan name is stamped on their unit.

Magneto Point

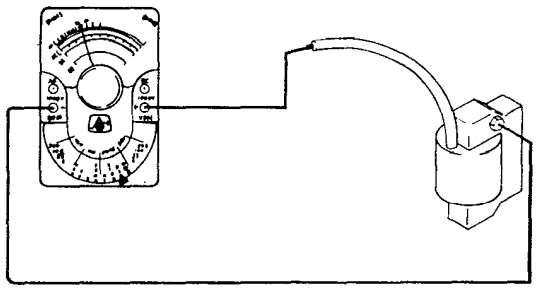
Usage: Lynx 2000S

External Coil

1. Disconnect the external coil wire plug from the ignition system.
2. Using the multitester, move the selector to the X1K position. Touch the leads together and zero the meter.
3. Measure the secondary winding resistance by placing one lead on the high tension lead and the other to the black wire in double plug from ignition coil.

L ..ne	Tester	Reading	Tolerance
AB25F1	Multitester	7600 ohms	± 20%

Fig. 8-7



0725-500

NOTE: When checking the secondary winding resistance, be sure to remove the resistor cap from the plug wire. Otherwise, an inaccurate reading will result.

4. Set the selector on the X1 setting and zero the meter.
5. Measure the primary winding resistance by connecting one lead to the black wire going to the coil and the other lead to the white and blue wire.

Engine	Tester	Reading	Tolerance
AB25F1	Multitester	0.9 ohm	± 15%

4. When adjusting the points, set the point gap at 0.3 - 0.4 mm (0.012 - 0.016 in.).

Lighting Coil

1. Set the selector of the multitester on the X1 setting and zero the meter.

2. Connect one lead to the yellow wire from the magneto and the remaining lead to the other yellow wire from the magneto. The standard value is 0.14 ohm.

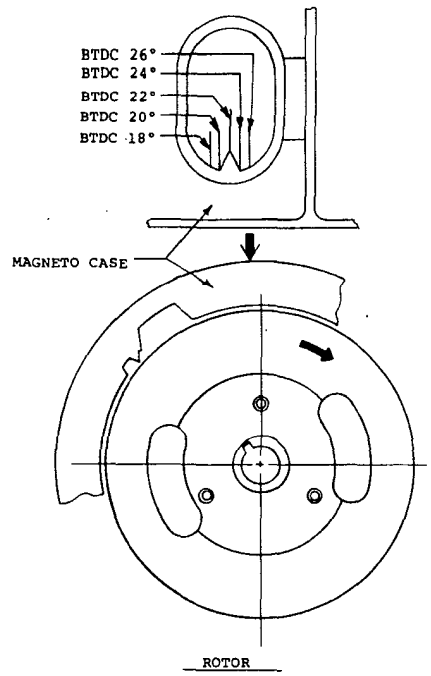
Ignition Timing

1. Adjust the point gap to 0.3-0.4 mm (0.012-0.016 in.), using a small screwdriver and feeler gauge.

NOTE: Be sure point contact surfaces are in good condition and free of contamination.

2. Since the spark plug hole has been tapped at an angle on this model, the head will have to be removed to use a dial indicator. The marks on the flywheel can be used when timing the engine. The long single mark corresponds to the top dead center (TDC) position when aligned with the magneto case timing mark. The center mark of the remaining marks is to be used for timing purposes. This mark corresponds with 22° before top dead center (BTDC).

Fig. 8-10

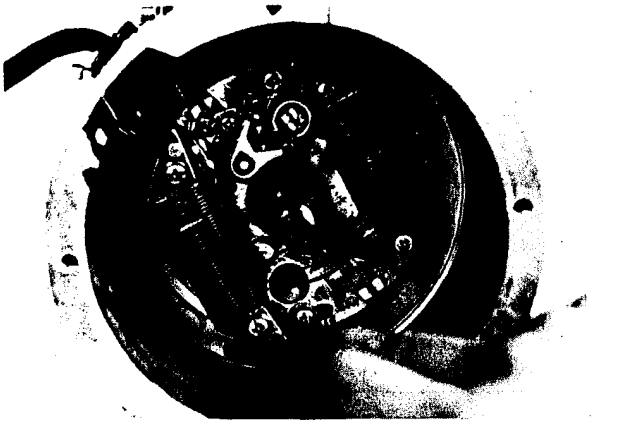


0725-069

3. Connect a point tester to the ignition lead from the points and the other lead to a good ground. Rotate the PTO end of the crankshaft 22° or 3.00 mm (0.118 in.) before top dead center (BTDC), or until the center timing mark aligns with the timing mark on the magneto case. At this position, the points should just begin to break. A change in sound of the testing buzzer or a change of light intensity of a continuity light will be noted.

4. If the timing is not correct, rotate the stator plate to obtain correct timing; then tighten stator plate screws.

Fig. 8-11



A416

5. Re-check timing after stator plate screws have been tightened.

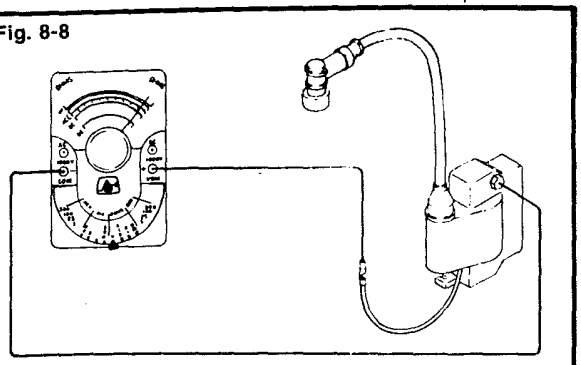
Magneto CDI Nippon Denso 120W

Usage: Lynx 2000T

High Voltage Output Test

1. Remove the resistor spark plugs and spark plug caps. For test purposes, install a NGK B8EV spark plug and an automotive type spark plug wire end.

Fig. 8-8



0725-412

Excitor Coil

1. Insert a piece of paper between the breaker point contact surfaces.
2. Disconnect the wiring harness from the engine. Set the selector on the X1 setting and zero the meter.
3. Disconnect the wires running from the magneto to the external coil. Connect one lead of the multitester to the black wire running from the magneto; then connect other lead to white and blue wire in double plug from engine.

Engine	Tester	Reading	Tolerance
AB25F1	Multitester	3.82 ohms	± 10%

Condenser-Resistance

1. Insert a piece of paper between the breaker point contact surfaces.
2. Remove the condenser and isolate it from the stator plate.
3. Set the tester at the installation resistance measuring range (X10K).
4. Connect the positive lead to the black wire of the condenser; then connect the negative lead to the condenser housing. The needle will rise sharply and gradually settle back. Use the reading when the needle stabilizes. Condenser resistance should be 10,000 ohms or more. If the reading is less, the condenser must be replaced.
5. Discharge the condenser by touching the black tester lead to the condenser housing.

Condenser-Capacity

The only test that can be made with the Arctic testers is a condenser resistance test. If the shop is equipped with a Merc-o-tronic or Graham-Lee coil and condenser tester, check the condenser capacity by setting the tester selection knob on the "condenser capacity" position. With the condenser on an insulated surface, connect one of the leads to the housing and the other lead to the condenser terminal. The capacity reading is read directly in micro-farads.

Engine	Tester	Reading
AB25F1	Merc-o-tronic or Graham-Lee	0.3 micro-farad

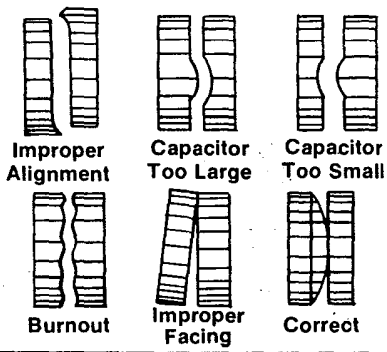
Using the same connections as above, rotate the selector knob to the "series resistance" position. A normal condenser will have a meter reading of less than one ohm. A reading over one ohm indicates high series resistance and requires condenser replacement.

Using the same connections as above, rotate the selector knob to the "condenser leakage" position. A good condenser at room temperature will have a reading of between 20 megohms and infinity. A shorted condenser will cause the needle on the meter to point to the extreme right. If the condenser fails any of the above tests, the condenser should be replaced.

Contact Points

1. Remove the contact points.
2. File the burned or burred point surfaces; then clean contacts with benzine or other suitable solvent.
3. Make sure contact points mate well with each other; apply grease on shaft; then install points.

Fig. 8-9



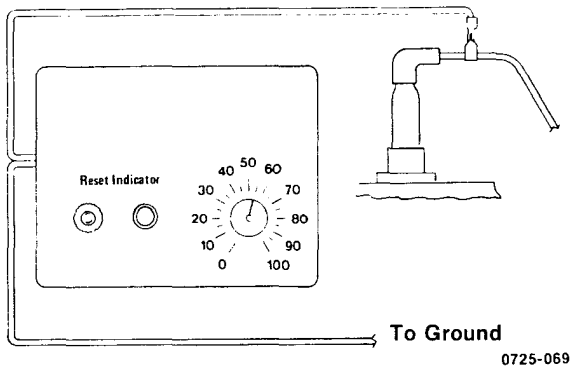
0725-425

2. Install the NGK B8EV plug in the MAG side cylinder. Attach plug wire with metal connector. Make sure the PTO side plug wire is attached to a spark plug and is properly grounded.

NOTE: Damage to the coils and CDI unit may result if the engine is cranked over when the spark plugs are not properly grounded.

3. Connect the yellow lead of the CDI tester to the MM-1 secondary adapter. Connect the adapter to the MAG side high tension lead. Connect the red tester lead to ground. Set the tester on 70 HIGH and crank engine over quickly. If the red light of the tester illuminates, the high voltage output is satisfactory.

Fig. 8-12



0725-069

Repeat the test three times for conclusive results. If the red light on the tester did not illuminate, proceed to CDI Unit Output test.

NOTE: If tester readings seem somewhat erratic, reverse the tester leads. The leads may be reversed without causing any damage to the tester.

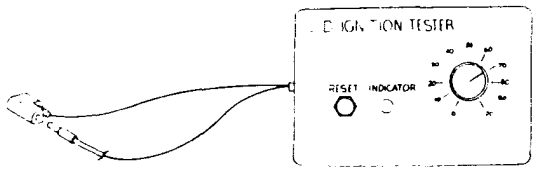
CDI Unit Output Test

1. Disconnect the two wires connecting the CDI unit to the external coil.

2. Connect the red tester lead to the black wire coming from the CDI unit.

3. Connect the yellow lead of the tester to the remaining white and blue wire coming from the CDI unit. Set the tester dial on 70 HIGH and crank engine over quickly. If the tester light illuminates, the external coil is bad. Repeat the test three times for conclusive results. If the light does not illuminate, proceed to the Charge and Trigger Output Tests.

Fig. 8-13

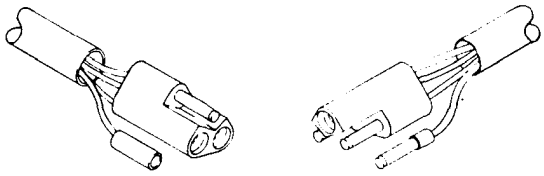


0725-140

Charge Coil Output Test

1. Disconnect the triple plug from the CDI unit to the magneto; then disconnect the single red and black wire outside the triple plug.

Fig. 8-14

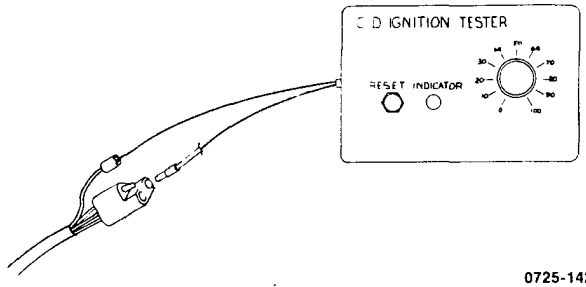


0725-189

2. Connect the red lead of the tester to the black and red wire in the triple plug. Connect the yellow lead of the tester to the single red and black wire.

3. Set the tester dial on 55 HIGH. Grasp recoil and crank engine over quickly. If the light illuminates, repeat the test three more times for conclusive results; then proceed to Trigger Coil Output Test. If the light does not illuminate, replace the charge coil and trigger coil as a set.

Fig. 8-15



0725-142

Trigger Coil Output Test

1. Disconnect the triple plug connecting the magneto to the CDI unit; then disconnect the single red and black wire located along side the triple connector plug.

2. Connect the red lead of the tester to the black and red wire in the triple plug; then connect the remaining tester lead to the black and white wire in the triple plug.

   Set the tester dial on the 70 LOW reading.

4. Grasp the recoil and crank engine over quickly. If tester light illuminates, trigger coil output is satisfactory. Repeat the test three times for conclusive results. If light fails to illuminate, replace the trigger coil and charge coil as a set.

NOTE: If charge coil and trigger coil output tests are satisfactory, but the CDI test is negative, CDI unit must be replaced.

Lighting Coil Resistance Test

1. Disconnect the main wiring harness from the engine connector.

2. Connect the ohmmeter leads to the two yellow leads in the engine connector.

3. The meter should be read 0.14 ohm.

Ignition Timing

1. Using a dial indicator, find top dead center (TDC) of the PTO side cylinder.

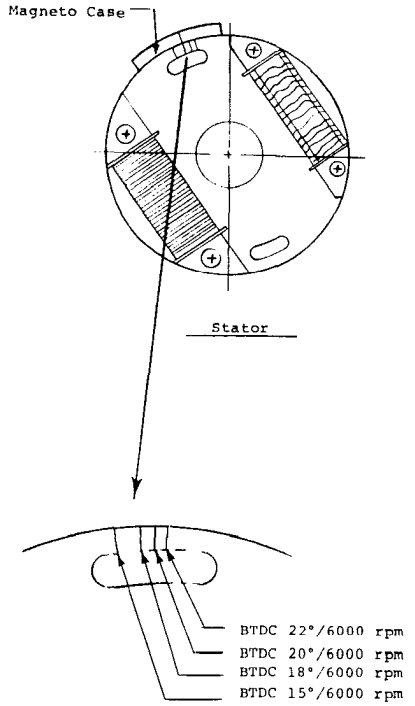
2. Rotate the drive clutch clockwise 1.86 mm or 0.073 in. (corresponds to 18° BTDC).

3. Make a reference mark on both the drive clutch and the engine. Use this mark to check timing.

4. The timing can be preset during engine repair by examining the position of ignition components.

5. Use the stator plate marks to preset timing. Rotate plate to align correct marks; then tighten screws securely.

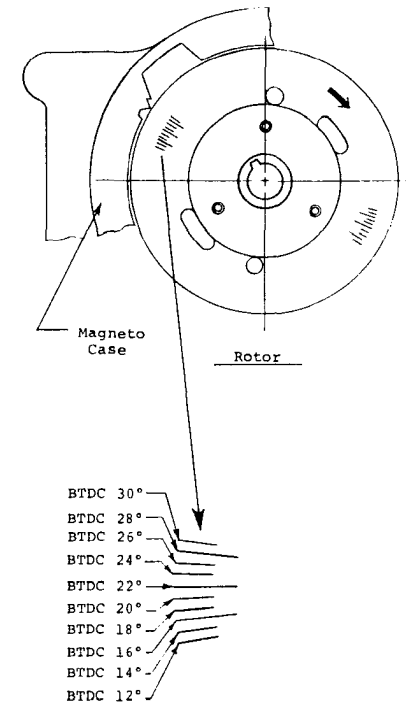
Fig. 8-16



6. Install starter pulley.

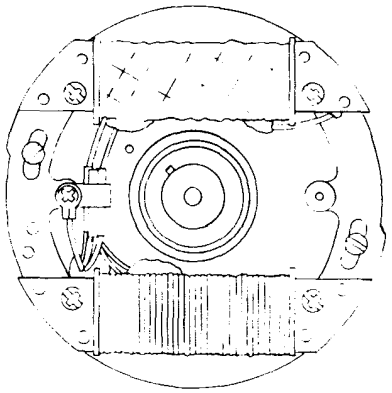
7. Start the engine and allow it to warm up thoroughly. Check the timing with a timing light. The 18° BTDC timing mark must align with the boss of the magneto housing when the engine is at 6000 rpm. If the marks were made according to step three, both marks must be aligned.

Fig. 8-17



8. To change the timing, rotate the magneto baseplate clockwise to retard the timing or counterclockwise to advance the timing. Tighten screws securely; then recheck timing.

Fig. 8-18



0725-025

NOTE: If either the magneto or the baseplate is replaced, the timing marks will no longer be accurate. Use a timing wheel or a dial indicator as in steps 1-3 to establish new marks.

Magneto CDI Kokusan 120W

Usage: **Lynx 2000T**
Jag 2000
Jag 3000

High Voltage Output Test

To accurately check the high voltage output, you must remove both the resistor-type spark plug cap and the resistor-type spark plug from the ignition system. In their place, for test purposes only, substitute a NGK B8EV spark plug and a metal automotive-type spark plug cap. If either of these resistor-type items are left in place while the CDI test is being conducted, an inaccurate reading will result. Each test listed below should be completed three times to confirm test results.

Push the reset button before each test. Before any ignition component is removed because of negative test results, be sure to first check the components wire leads and connectors for breaks and corrosion. Costly repair may be prevented by merely resoldering a wire or cleaning a connector. Make sure all switches are ON and in good working order. Refer to page 152 for the procedure on checking the switches.

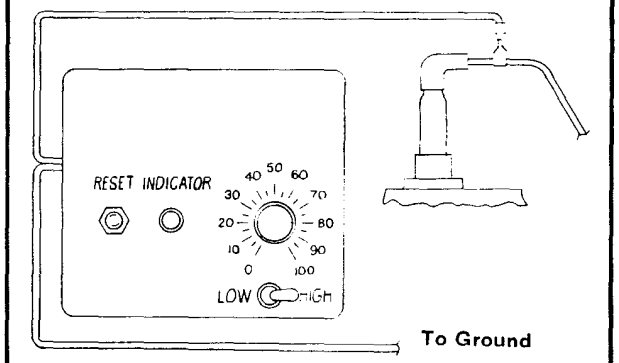
⚠ WARNING ⚠

Before any of the test procedures are carried out, be sure to place the back of the machine up on a safety stand. Check to be sure the track is off the ground.

1. Install a NGK B8EV plug that is properly gapped at 0.5 mm or 0.020 in No. 2 cylinder next to the flywheel. Attach the spark plug wire with its metal connector. No. 1 spark plug wire must remain attached to No. 1 spark plug or grounded to the engine. **Never** crank the engine over without first checking to be sure that both plug wires are grounded. Damage to the CDI unit may result.

2. Connect the MM-1 adaptor to No. 2 spark plug wire just behind the metal cap. Connect the red lead of the tester to the clip of the MM-1 adaptor and ground the yellow lead of the tester to the engine.

Fig. 8-19



0725-498

3. Set the dial on the tester to 80 high scale. Crank the engine over quickly. If the red light of the tester fails to illuminate, high voltage isn't satisfactory and there is a problem indicated in the ignition system. Repeat the test three times for conclusive results. Proceed to CDI Unit Output Test.

NOTE: If the tester light does illuminate but there was no previous spark at the spark plug electrode, then either the spark plug cap or the spark plug itself is defective.

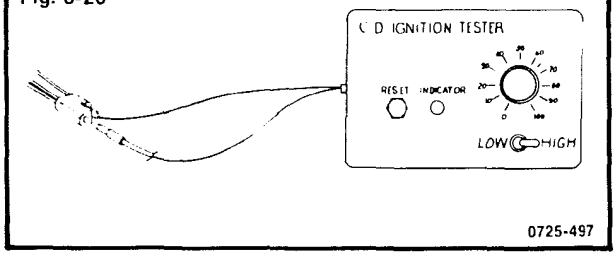
CDI Output Test

1. Disconnect the double wire plug connecting the CDI unit to the external coil.

2. Connect the yellow lead of the tester to the white and blue wire in the double plug coming from the CDI unit.

3. Connect the red lead of the tester to the remaining black and white wire in the double plug.

Fig. 8-20



0725-497

4. Set the tester on 75 high scale. Grasp the recoil handle and crank the engine over quickly. If the light of the tester illuminates, the CDI output is satisfactory. This pinpoints the external coil as being defective and it should be replaced. Repeat the test three times for conclusive results. If the tester light fails to illuminate, proceed to testing the charge and trigger coil.

Charge Coil Test

1. Disconnect the triple wire plug connecting the CDI unit to the magneto system.

2. Connect the positive red lead of tester to red and white wire located in triple plug from engine magneto. Ground the yellow negative lead of tester to the engine.

3. Set the tester on 65 high scale. Grasp the recoil and crank the engine over quickly. If the tester light illuminates, the charge coil output is satisfactory. Proceed to Trigger Coil Output Test.

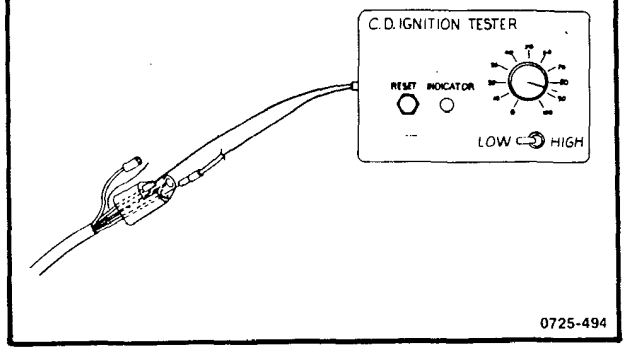
Trigger Coil Output Test

1. Disconnect triple wire plug from engine to the CDI unit. Also disconnect the single black wire located outside of the triple plug.

2. Connect the red lead of tester to the red and white wire in the triple plug. Connect the yellow lead of tester to the black and red wire in the same plug using wire adapter harness.

3. Set the tester on 85 low scale. Crank the engine over quickly. If the light illuminates, the trigger coil output is satisfactory. If the light fails to illuminate, push reset button and conduct test again. If the test is still negative, replace the trigger coil.

Fig. 8-21



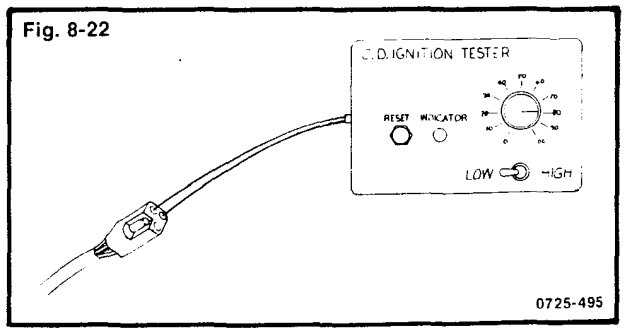
0725-494

NOTE: Any time a defective CDI unit is replaced, recheck the engine timing.

Lighting Coil Test

1. To conduct the lighting coil test, first place the machine on a safety stand so that the track is off the ground.

Fig. 8-22



0725-495

2. Disconnect the two yellow wires coming from the magneto. Connect the two tester leads to either of the yellow wires.

3. Set the tester on 80 low scale. Grasp the recoil handle and crank the engine over quickly. If the tester light illuminates, the lighting coil output is satisfactory. Repeat the test three times for conclusive results. If the light fails to illuminate, the lighting coil leads should be checked for breaks, corrosion and tightness at the connectors. If connectors are tight and free of corrosion, the lighting coil should be replaced.

Summary

1. High Voltage Output Test

   A. For safety purposes, put back of the machine on a test stand so that the track does not contact the ground.

   B. Remove resistor cap and spark plug from No. 2 cylinder.

   C. Replace cap and spark plug with non-resistor components.

   D. Connect MM-1 adaptor to No. 2 spark plug wire just behind cap.

   E. Connect red lead of tester to clip of MM-1 adaptor.

   F. Connect yellow lead of tester to a good ground on the engine.

   G. Set the tester on 80 high scale.

   H. Crank the engine over quickly. Repeat test 3 times. Push reset button between each test.

2. CDI Output Test

   A. Disconnect double plug connector between CDI unit and external coil.

   B. Connect the yellow lead of the tester to white and blue wire from CDI unit.

   C. Connect the red lead of the tester to black and white wire from CDI unit.

   D. Set tester on 75 high scale.

   E. Crank the engine over quickly. Repeat test 3 times to confirm results. Push reset button between each test.

3. Charge Coil Test

   A. Disconnect triple wire plug from engine to CDI unit.

   B. Connect red lead of tester to red and white wire in triple plug connector.

   C. Set tester on 65 high scale; crank the engine over quickly.

   D. Repeat test 3 times. Push reset button between each test. If the light doesn't illuminate, replace the charge coil.

4. Trigger Coil Output Test

   A. Disconnect triple wire plug from engine to CDI unit.

   B. Connect red lead of tester to the red and white wire in triple plug. Connect the yellow lead of tester to the black/red wire in triple plug.

   C. Set tester on 85 low scale. Crank the engine over quickly.

   D. Light must illuminate. Repeat test 3 times.

5. Lighting Coil Output Test

   A. Be sure machine is on safety stand with track off the ground.

   B. Disconnect yellow wires coming from magneto.

   C. Connect leads of tester to the two yellow leads from the magneto. (Does not make any difference which of the test leads are connected to the two yellow magneto wires as long as one tester lead is connected to each of the two).

   D. Set tester on 80 low scale.

   E. Crank the engine over quickly. Repeat test 3 times to confirm results. Push reset button each time.

Ignition Timing

1. Using a dial indicator, find top dead center (TDC) of the PTO side cylinder.

2. Rotate the drive clutch clockwise 1.44 mm or 0.056 in. (corresponds to 16° BTDC).

3. Make a reference mark on both the drive clutch and the engine. Use this mark to check timing.

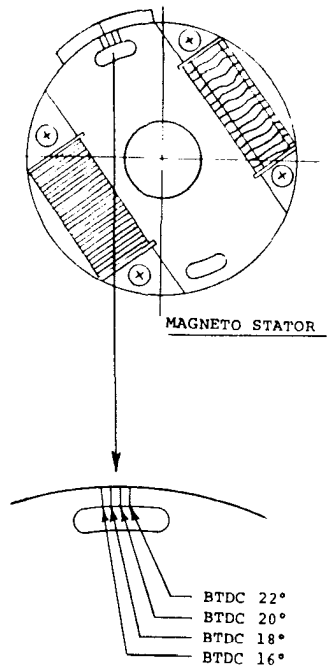
4. The timing can be preset during engine repair by examining the position of ignition components.

5. Use the stator plate marks to preset timing. Rotate plate in the proper direction; then tighten screws securely.

6. Install starter pulley.

7. Start the engine and allow it to warm up thoroughly. Check the timing with a timing light. The 16° BTDC timing mark of the flywheel must align with the boss of the magneto housing (located under CDI unit) at 6000 rpm. If the marks were made according to step three, both marks must be aligned.

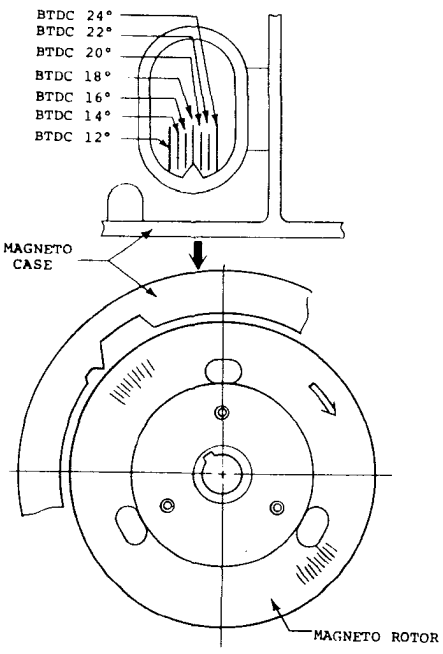
Fig. 8-23



0725-772

8. Rotate the magneto baseplate clockwise to retard the timing or counterclockwise to advance the timing.

Fig. 8-24



0725-771

9. Tighten screws and check timing.

NOTE: If either the magneto or the baseplate is replaced, the timing marks will no longer be accurate. Use steps 1-3 to establish new marks.

Magneto CDI Kokusan 120W

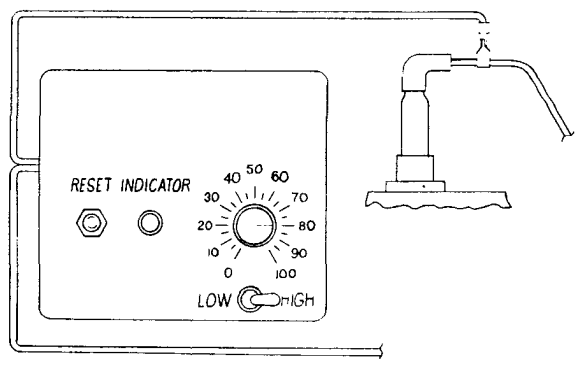
Usage: Pantera FA

High Voltage Output Test

To accurately check the high voltage output, remove both the resistor type spark plugs and resistor cap from the spark plug wire. In their place, for test purposes only, substitute a B9EV spark plug and a metal automotive type spark plug wire end. If either of these resistor type items is left in place while tests are being conducted, an inaccurate reading will result.

1. Install the B9EV plug in No. 2 cylinder next to flywheel. Attach plug wire with metal connector. Also have No. 1 plug wire either grounded or attached to a spark plug. NEVER CRANK ANY ENGINE OVER WITH THE PLUG WIRE NOT BEING GROUNDED. DAMAGE TO THE COIL OR CDI UNIT WILL RESULT.
2. Connect the yellow lead tester to No. 2 plug wire with MM-1 secondary output adaptor. Ground the red lead of tester to the engine. Set the dial of the tester on 70. Crank the engine over quickly. If the red light of tester fails to illuminate, high voltage is not satisfactory and there is a problem indicated in the ignition system. Repeat the test three times for conclusive results. Proceed to CDI Unit Output Test.

Fig. 8-25



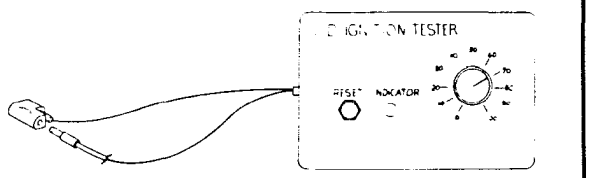
0725-498

CDI Unit Output Test

1. Disconnect the double wire plug connecting the CDI unit to the external coil.

2. Connect the red lead of the CDI tester to the black and white wire from the CDI unit. Connect the yellow lead of the CDI tester to the remaining blue and white wire in the plug. Use special adaptor for making connection.

Fig. 8-26



0725-140

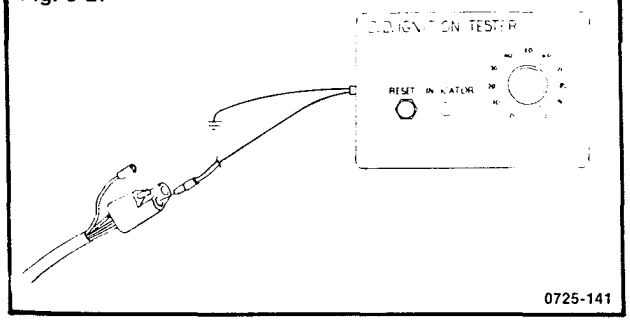
3. Set the tester selector on 80 high scale. Grasp the recoil and crank the engine over quickly. If the light of tester illuminates, CDI unit output is satisfactory. This also pinpoints the external coil as being defective, and it should be replaced. Repeat the test three times for conclusive results. If the light fails to illuminate, proceed to testing the charge coil and trigger coil.

Charge Coil Output Test

1. Disconnect the triple plug connecting the CDI unit to the magneto system.

2. Connect the red lead of the tester to the red and white wire in the triple plug from the magneto; then connect the other lead to a good ground on the engine.

Fig. 8-27



0725-141

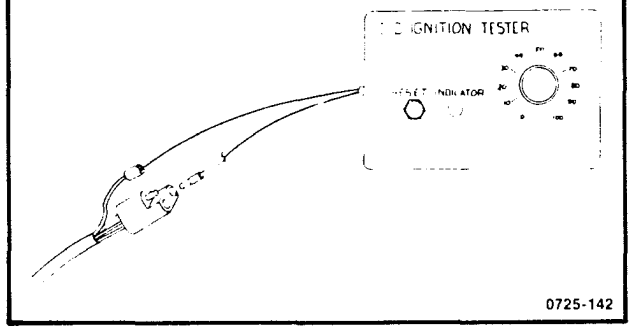
3. Set the tester on 55 high scale. Grasp the recoil and crank the engine over quickly. If the tester light illuminates the charge coil output is satisfactory. Repeat the test three times for conclusive results. Proceed to Trigger Coil Output Test.

Trigger Coil Output Test

1. Move the switch on the tester to the LOW position. Set the tester dial on 70.

2. Connect the red tester lead to the red and white wire in the triple plug from the magneto; then connect the yellow lead to the black and red wire located in the same plug.

Fig. 8-28



0725-142

3. Grasp the recoil and crank the engine over quickly. If the light illuminates on the tester, the output of the trigger coil is satisfactory. Repeat test three times for conclusive results. If the light fails to illuminate, replace the trigger coil.

NOTE: If both trigger and charge coil tests are satisfactory and the CDI Output Test is negative, the CDI unit must be replaced.

Lighting Coil Test

NOTE: Use steps 1-3 for resistance; steps 4-8 for output.

1. Disconnect the main wiring harness from the engine connector.

2. Connect ohmmeter to the two yellow wires in engine connector.

3. Meter should register 0.18 ohm if coil is good.

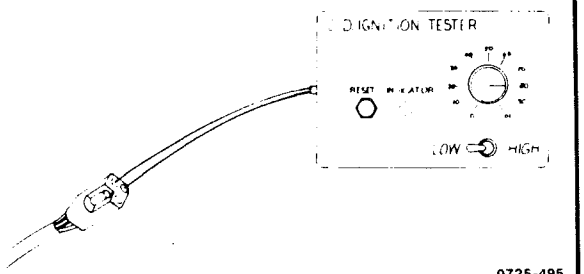
4. To check voltage regulator, proceed to Check Voltage Regulator.

5. Disconnect the main wiring harness from the engine.

6. Connect the red tester lead to either of the yellow wires located in the four-prong plug; then connect the remaining lead to the other yellow wire in the plug.

7. Set tester dial on 80 with the switch in the LOW position.

Fig. 8-29



0725-495

8. Grasp recoil and crank engine over quickly. Light must illuminate if lighting coils are in good condition. Repeat test three times for conclusive results.

Summary

1. High Tension Output Test

   A. Remove resistor cap from high tension wire. Remove resistor type BR9EV spark plug.

   B. Replace cap with metal automotive wire end and replace plug with NGK B9EVA for test.

   C. Set tester on 70 high.

   D. With MM-1 adaptor, connect red lead of tester to high tension lead.

   E. Ground yellow lead of tester to engine.

   F. Crank engine over quickly.

   G. Repeat test 3 times - push reset button after each test.

2. CDI Output Test

   A. Disconnect double wire plug from CDI unit to external coil.

   B. Connect red lead of tester to black and white wire in double wire plug from CDI unit.

   C. Connect yellow lead of tester to blue and white wire which is also in double wire plug.

   D. Set dial of tester on 80 high.

   E. Crank engine over quickly.

   F. Repeat test 3 times - push reset button after each test.

3. Charge Coil Output Test

   A. Disconnect triple wire plug from engine magneto to CDI unit.

   B. Connect red lead of tester to red and white wire in triple plug connector from magneto.

   C. Ground the negative or yellow lead of tester to a good ground.

   D. Set tester on 55 high.

   E. Crank engine over quickly.

   F. Repeat test 3 times - push reset button after each test.

4. Trigger Coil Output Test

   A. Disconnect triple plug from engine magneto to CDI unit.

   B. Connect the red lead of tester to the red and white wire in triple plug from the magneto.

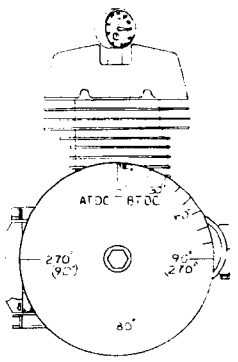
   C. Connect the yellow lead of tester to the black and red wire located in the same plug. Set tester on 70 low.

   D. Grasp recoil and crank engine over quickly. Repeat test 3 times. Push reset button each time.

Ignition Timing

1. Use the dial indicator to find top dead center (TDC) of the PTO side cylinder.

Fig. 8-30



0725-024

2. Rotate the PTO end of the crankshaft opposite normal shaft rotation 20° (0.098 in. or 2.49 mm).

3. Make a reference mark on the PTO cylinder and a corresponding mark on the drive clutch. These marks will be used to check the ignition timing.

4. Remove the dial indicator and install the spark plug.

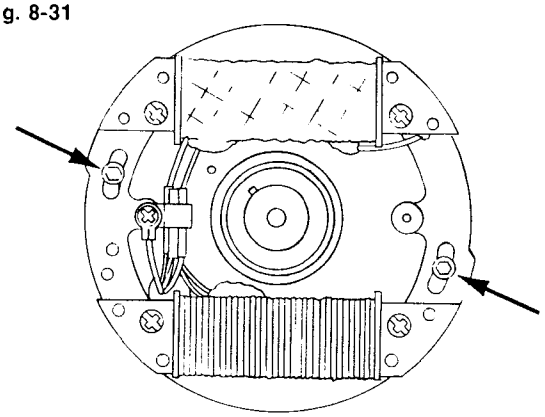
5. Start the engine. Check the timing with a timing light. The timing marks must align when the engine is at 6000 rpm.

6. To change the timing, remove the recoil starter and the starter pulley; then loosen the two hex key cap screws securing the magneto baseplate to the magneto housing.

7. Rotate the baseplate clockwise to retard the timing or counterclockwise to advance the ignition timing.

8. Tighten the magneto baseplate mounting screws and recheck timing.

Fig. 8-31



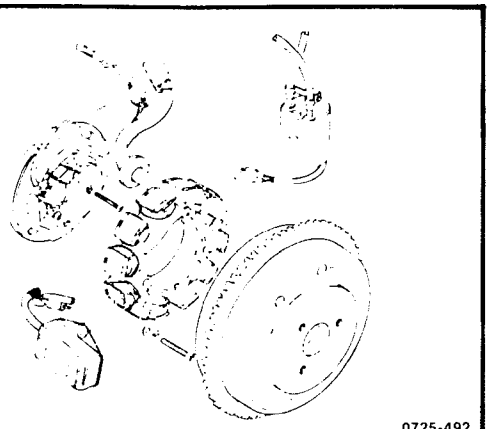
0725-397

Magneto CDI Nippon Denso 150W

Usage: **Pantera FC**
Panther
Cheetah

The new 150 watt Nippon Denso CDI ignition is used on all 1978 fan cooled engines. With the increased output from this new lighting system, customers will now have better lights at slow trail riding speeds, plus improved battery charging capability when the snowmobile is equipped with electric start.

Fig. 8-32



0725-492

In Fig. 8-32, the components of this new system are shown. All of these components must be in excellent working order to achieve top engine performance. The coil ring has 12 coils located around its outer circumference. Eight of these coils are used in making up the 150 watt lighting system, three are used for the ignition system (charge coils) and one is used to support internal wires.

If any one of the 12 coils should fail, the coil ring will have to be replaced as a complete unit. To troubleshoot this ignition, use the model 1-L tester and the procedure listed below. The first test to perform in troubleshooting is the high voltage test.

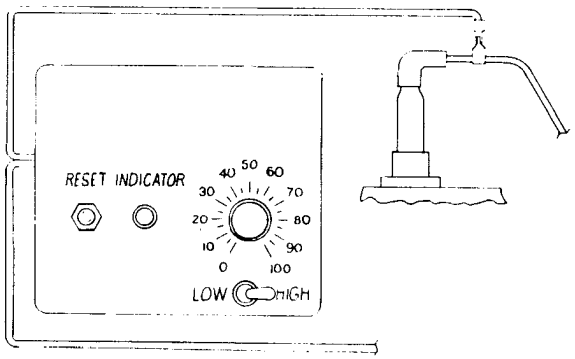
High Voltage Output Test

Before the ignition can be tested, first remove the resistor-type spark plug which has an "R" stamped on its ceramic sleeve, and also the resistor-type spark plug wire cap from the number 2 cylinder. In place of these two items, substitute an automotive metal spark plug wire cap and a non-resistor type spark plug of the same heat range. Be sure to gap the plug at 0.5 mm or 0.020 of-an-inch. Failure to remove these two resistor-type items will result in inaccurate readings.

1. Install a non-resistor type plug in No. 2 cylinder next to flywheel. Attach No. 2 spark plug wire with metal connector to the spark plug. Next, install the No. 1 spark plug and attach the high tension lead. Never crank the engine over with either of the spark plug wires not being grounded or attached to the spark plugs. Damage to the coil or CDI unit will result.

2. Connect the MM-1 adaptor to the No. 2 spark plug wire. Next, attach the red lead of the tester to the end of the MM-1 adaptor as shown in Fig. 3-33. Ground the yellow tester lead to the engine. Set the tester selector knob on 80 high scale. Grasp the recoil handle and crank the engine over quickly. If the red light of tester fails to illuminate, high voltage isn't satisfactory and there is a problem indicated in the ignition system. Repeat test 3 times to confirm results. Proceed to CDI Unit Output Test.

Fig. 8-33



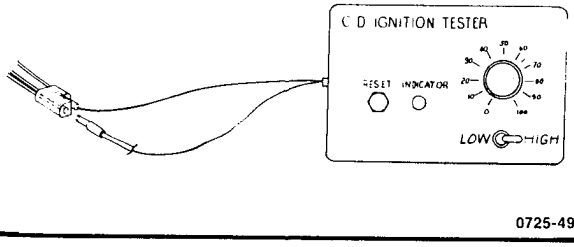
0725-498

C' nit Output Test

1. Disconnect the CDI unit from the external coil.

2. Perform the test on those wires which are coming from the CDI unit. Using the wire adaptor harness, connect the yellow lead of tester to the white and blue wire; then connect red lead of tester to the remaining black wire in the double plug.

Fig. 8-34



0725-497

3. Set the tester selector knob on 65 high scale. Grasp the recoil and crank the engine over quickly. If the light of the tester illuminates, CDI unit output is satisfactory. This points the external coil as being defective since it didn't test satisfactorily in the previous test. It should then be replaced. If the light fails to illuminate, proceed to the Charge Coil Output Test. Be sure to perform each test 3 times to confirm test results. Push reset button before each test.

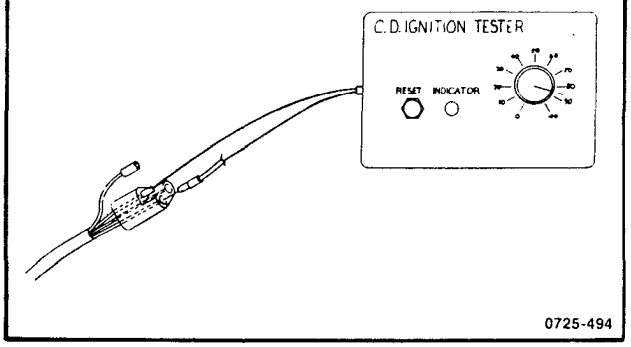
Charge Coil Output Test

1. Disconnect the triple wire plug connecting the CDI unit to the internal charge coils. Also, disconnect the single green wire located outside the triple plug.

2. When conducting the charge coil test, you will be testing the current output of the red and white wires located inside the triple plug. Again, be sure to test the correct wires. Perform test on those wires running to the engine and not those coming from the CDI unit. Note that there is a black wire located in the triple plug. This wire is the ground wire for the charge coils.

3. To conduct the charge coil test, attach the adaptor wires to the red wire in the triple plug. Connect the red lead of the tester to the adaptor wire which leads to the red wire in the triple plug. Attach the yellow wire to the black wire in the triple plug. Set the tester on 50 high scale, Fig. 8-35. Grasp the recoil and crank the engine over quickly. If the light illuminates, push reset button and perform test 2 more times to confirm test results. If the light fails to illuminate, replace the charge coil ring. If test proves to be positive, proceed to check the current output of the white wire.

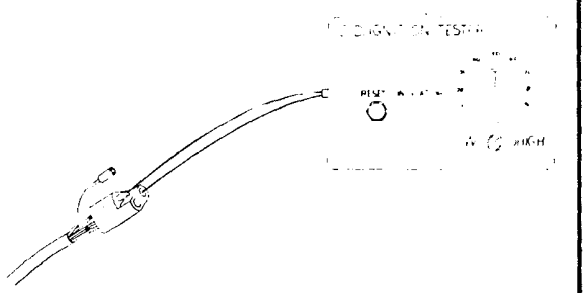
Fig. 8-35



0725-494

4. Before the charge coils can be considered in good condition, positive test results must be found in testing both the red and white wires. To conduct test on white wire, leave the yellow lead of tester attached to the black wire in triple plug. Also, leave the tester set on 50 high scale. Move the red tester lead to the white wire, Fig. 8-36. Push the reset button, grasp the recoil and crank the engine over quickly. Again, the tester light must illuminate if the charge coils are in good condition. If the light fails to illuminate, replace the charge coil ring.

Fig. 8-36



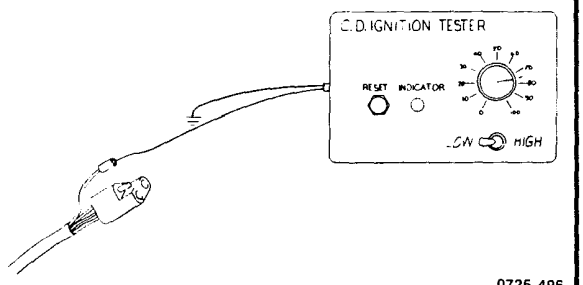
0725-493

5. If both tests performed on the charge coils prove to be positive, we can then proceed to the final test, the Trigger Coil Output Test.

Trigger Coil Output Test

1. To conduct the trigger coil output test, connect the yellow lead of tester to the single green wire located outside of the triple plug. Attach the red tester lead to a good ground on the engine. Set the tester on 75 low scale.

Fig. 8-37



0725-496

2. Grasp the recoil and crank the engine over quickly. If the tester light illuminates, the output from the trigger coil is sufficient. Push the reset button and conduct the test a couple more times to confirm test results. If you find that both the charge coils and the trigger coil components test good, you can assume that the CDI unit is bad if you did not get a positive reading when performing CDI unit tests. If the light on the tester fails to illuminate during the trigger coil test, replace the trigger coil. After you have completed repair and testing of the ignition, be sure to connect all wires and connectors.

Lighting Coil Output Test

If you have a customer with a lighting problem, you can also test the lighting coil output with the model 1-L tester.

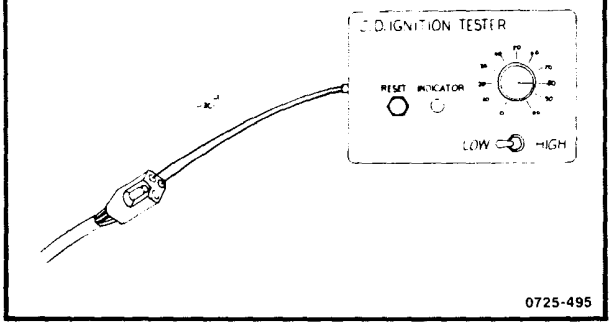
1. To conduct the lighting coil test, first place the machine on a safety stand so the track is off the ground.

⚠ WARNING ⚠

NEVER let anyone stand behind or in front of the machine during test. This is a safety precaution in the event the engine should start.

2. Disconnect the main wiring harness from the engine. Locate the two yellow wires in the four prong plug coming from the engine, Fig. 8-38. Connect the yellow and red leads of the tester to these two yellow wires. In this test, the leads may be reversed without affecting the test results.

Fig. 8-38



0725-495

3. Set the tester on 80 low scale. Grasp the recoil and crank the engine over quickly. If the tester light fails to illuminate, replace the coil ring. Push button and conduct test three times to confirm test results.

Summary

1. Nippon Denso (150 Watt, 1978 Fan Cooled Spirit) Ignition Test

   A. Remove resistor cap and spark plug from No. 2 cylinder.

   B. Replace cap and spark plug with non-resistor components.

   C. Set tester on 80 high scale.

   D. With MM-1 adaptor, connect red tester lead to No. 2 spark plug wire.

   E. Ground yellow lead of tester to engine.

   F. Crank engine over quickly. Repeat test 3 times - push reset button before each test.

2. CDI Output Test

   A. Disconnect double wire plug from CDI unit to external coil.

   B. Connect the yellow lead of tester to white and blue wire in double plug.

   C. Connect the red lead of tester to remaining black wire.

   D. Set tester on 65 high scale.

   E. Crank engine over quickly.

   F. Repeat test 3 times - push reset button after each test.

3. Charge Coil Output Test

   A. Disconnect triple plug from CDI unit to engine.

   B. Disconnect the single green wire outside triple plug.

   C. Connect the red lead of tester to red wire in triple plug from engine.

   D. Connect the yellow lead of tester to the black wire in triple plug.

   E. Set tester on 50 high scale.

   F. Crank engine over quickly - repeat test 3 times to confirm test - push reset button between each test.

   G. Move red lead of tester to white wire in triple plug. Leave tester set on 50 high scale - and yellow wire attached to black wire.

   H. Crank engine over quickly.

   I. Both red and white wires in triple plug must test good before charge coils are considered satisfactory.

4. Trigger Coil Output Test

   A. Connect yellow lead of tester to single green wire coming from engine.

   B. Connect red lead of tester to a good ground on engine.

   C. Set tester on 75 low scale.

   D. Crank engine over quickly - repeat test 3 times to confirm results.

5. Lighting Coil Output Test

   A. Set machine on a safety stand.

   B. Disconnect main wiring harness.

   C. Connect red and yellow tester leads to the 2 yellow wires in main wiring harness coming from engine.

   D. Set tester on 80 low scale.

   E. Crank engine over quickly - push reset button and repeat test 3 times to confirm test.

Servicing Engine Electrical System

Ignition Coil

1. Remove the two screws securing the ignition coil in place on the fan housing.

2. Disconnect the ignition coil wiring harness from the engine wiring harness.

3. Remove the spark plug caps from the coil leads by rotating the caps counterclockwise.

4. Install the caps on the ignition leads by rotating the caps clockwise; then slide cap seals onto caps.

5. Secure coil in place with two cap screws and washers.

6. Connect the coil harness to the engine harness.

CDI Unit

1. Remove the two cap screws securing the CDI unit in place on the fan housing.

2. Disconnect the CDI wiring harness from the main engine harness.

3. Place the new CDI unit in position and secure with two cap screws and washers.

4. Connect the CDI harness to the engine wiring harness.

Magneto Components.

NOTE: If removal of the flywheel or magneto components is necessary, the engine must be removed from the chassis on Pantera models.

1. Remove the four cap screws securing the recoil on the fan housing.

2. Remove the three cap screws holding the pulley starter and fan drive pulley against the flywheel.

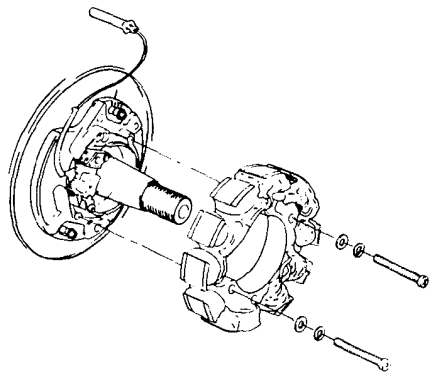
3. Remove the nut, lock washer and spacer washer securing the flywheel on the crankshaft.

NOTE: If an impact wrench is not available, secure the pulley starter on the flywheel with the recoil bolts; then use the special flywheel spanner to prevent the crankshaft from turning when removing the nut.

4. Using the special flywheel puller and attachment, remove the flywheel from the crankshaft. Place flywheel on a clean surface with the magnets facing upward.

5. To remove the lighting/charge coil, remove the two screws and washers securing the coil ring to the stator baseplate.

Fig. 8-39



0725-445

6. Disconnect the wiring harness and guide harness w/grommet through the fan housing.

NOTE: Be sure to loosen the harness clamp.

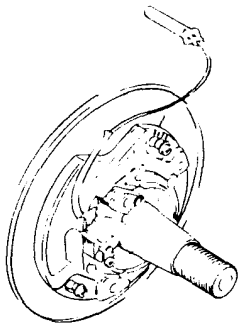
7. To install the coil ring, proceed to step 14.

8. To remove the trigger (timing senser) coil, remove the two screws and washers securing trigger coil to the baseplate.

9. Guide the green wire through the grommet; then remove trigger coil. For assembly, proceed to step 13.

10. To remove the baseplate, remove two screws and washers securing baseplate to the fan housing, Fig. 8-40. For assembly, proceed to step 12.

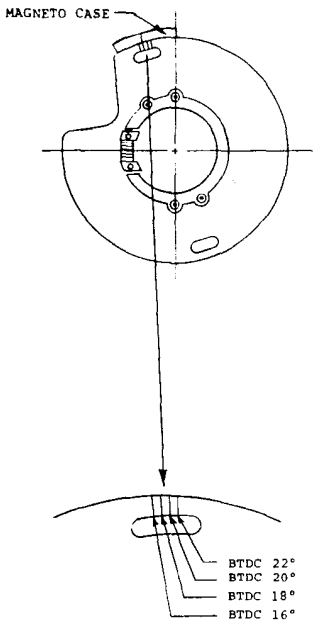
Fig. 8-40



0725-446

11. To assemble the magneto components, care must be taken to ensure correct engine timing. On the baseplate are four timing reference marks. When viewing the marks from left to right, the marks correspond to 16, 18, 20 and 22 degrees before top dead center (BTDC). To time the engine for assembly purposes, align second mark from the left with the center of the upper baseplate mounting hole (18° BTDC).

Fig. 8-41



0725-775

12. Secure the baseplate with two cap screws and washers.

13. Fasten the trigger coil to the baseplate, using two screws and washers.

NOTE: Apply Loc-Tite to the screws before assembly.

14. Fasten the lighting/charge coil ring to the baseplate of the stator, using two screws and washers.

NOTE: Apply Loc-Tite to the screws before assembly.

15. Align the woodruff key in the crankshaft with the slot in the flywheel; then guide the flywheel on to the crankshaft.

NOTE: Be sure the flywheel magnets are free of any foreign material.

16. Install the spacer washer, lock washer and nut on the end of the crankshaft; then tighten the flywheel nut to 9.0 - 11.1 kg-m (65 - 80 ft-lb).

NOTE: The pulley starter may be fastened to the flywheel and used in conjunction with the special flywheel spanner to prevent the crankshaft from turning when tightening the flywheel nut.

17. Place the fan drive pulley and pulley starter against the flywheel and secure using three cap screws and washers. Tighten the cap screws to 0.7 - 1.0 kg-m (5 - 7 ft-lb).

18. Place the recoil in position and secure with the four mounting screws. BEFORE tightening the mounting screws, pull the rope slightly to engage the recoil pawls. This will self-center the recoil on the housing. Tighten screws to 0.7 - 1.0 kg-m (5 - 7 ft-lb).

Ignition Timing

1. Use the dial indicator to find top dead center (TDC) of the PTO side cylinder.

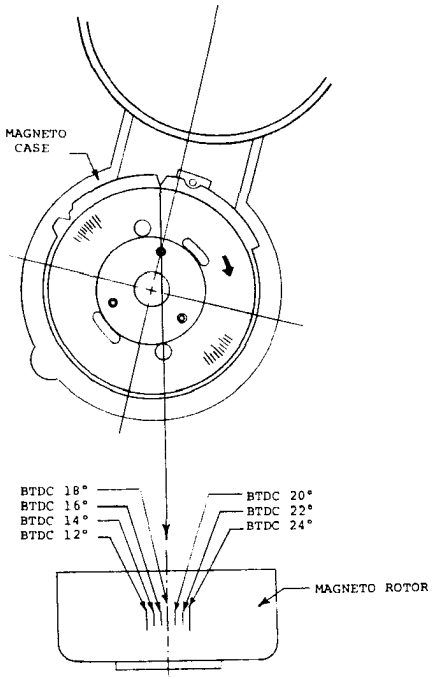
2. Rotate the PTO end of the crankshaft opposite normal shaft rotation 18°, 2.0 mm or 0.080".

3. When the correct reading is reached, make a reference mark on the drive clutch housing and a corresponding mark on the PTO cylinder. These marks will be used to check timing.

4. Remove the dial indicator and install the spark plug.

5. Start the engine. Check the timing with a timing light. The timing marks must align when the engine is at 6000 rpm.

Fig. 8-42



0725-776

6. If the timing is off, remove the recoil starter, the starter pulley and the fan drive pulley.

NOTE: On Pantera FC, the engine will have to be removed from the chassis.

7. Remove the flywheel nut and lock washer; then remove the flywheel with the aid of a flywheel puller.

8. Remove the two screws securing the lighting coil ring to the baseplate.

9. Loosen the two screws securing baseplate to the magneto case. Rotate the baseplate clockwise to retard the timing or counter-clockwise to advance the timing.

10. Tighten the baseplate screws; then install the lighting coil.

11. Install the flywheel, lock washer and nut; then tighten flywheel nut to 9.0 - 11.1 kg-m or 65 - 80 ft-lb.

12. Install the fan drive pulley, axial belt and starter pulley; then install the recoil starter assembly.

13. Recheck ignition timing and readjust if necessary.

Ignition Resistance Tests

Ignition System: Nippon Denso CDI 150W

Models: Panther, Cheetah, Pantera FC

ITEM	RESISTANCE	CONNECTIONS	
Magneto			
Charge Coil	200 ohms ± 10%	+To Red	-To Black
Charge Coil	1.5 ohms ± 10%	+To White	-To Red
Pulser Coil	31.2 ohms ± 10%	+To Green	-To Black
Lighting Coil	0.17 ohm ± 10%	+To Yellow	-To Yellow
Ignition Coil			
Primary	0.23 ohm ± 15%	+To Wht/Blu	-To Black
Secondary	1400 ohms ± 20%	+To H.T. Lead	-To H.T. Lead
Spark Plug Cap	5000 ohms ± 10%	+To H.T. Terminal	-To Plug Terminal

Ignition System: Kokusan CDI 120W

Models: Lynx 2000T*, Jag 2000, Jag 3000

ITEM	RESISTANCE	CONNECTIONS	
Magneto			
Charge & Pulser	127.5 ohms ± 10%	+To Red/Wht	-To Blk/Wht
Charge	44 ohms ± 10%	+To Blk/Red	-To Red/Wht
Lighting	0.18 ohm ± 10%	+To Yellow	-To Yellow
Ignition Coil			
Primary	0.22 ohm ± 15%	+To Wht/Blu	-To Blk/Wht
Secondary	5850 ohms ± 20%	+To H.T. Lead	-To H.T. Lead
Spark Plug Cap	5000 ohms ± 10%	+To H.T. Terminal	-To Plug Terminal

*The 2000T Lynx engine may have either the Nippon Denso or the Kokusan ignition system. The ignition system can be identified by the brand stamping on the CDI unit.

Ignition System: Kokusan CDI 120W

Models: Pantera FA

ITEM	RESISTANCE	CONNECTIONS	
Magneto			
Charge Coil	127.5 ohms ± 10%	+To Red/Wht	-To Ground
Pulser Coil	44 ohms ± 10%	+To Red/Wht	-To Red/Blk
Lighting Coil	0.18 ohm ± 10%	+To Yellow	-To Yellow
Ignition Coil			
Primary	0.22 ohm ± 15%	+To Wht/Blu	-To Black
Secondary	5850 ohms ± 20%	+To H.T. Lead	-To H.T. Lead
Spark Plug Cap	5000 ohms ± 10%	+To H.T. Terminal	-To Plug Terminal

Ignition System: Nippon Denso CDI 120W

Model: Lynx 2000T*

ITEM	RESISTANCE	CONNECTIONS	
Magneto			
Charge/Trigger	1.8 ohms ± 10%	+To Blk/Red	-To Blk/Wht
Charge/Trigger	170 ohms ± 10%	+To Red/Blk	-To Blk/Wht
ighting	0.14 ohm ± 10%	+To Yellow	-To Yellow
Ignition Coil			
Primary	0.3 ohm ± 15%	+To Wht/Blu	-To Blk
Secondary	1500 ohms ± 20%	+To H.T. Lead	-To H.T. Lead
Spark Plug Cap	10,000 ohms ± 10%	+To H.T. Terminal	-To Plug Terminal

*The 2000T Lynx engine may have either the Nippon Denso or the Kokusan ignition system. The ignition system can be identified by the brand stamping on the CDI unit.

Ignition System: Nippon Denso Magneto Point 120W

Model: Lynx 2000S

ITEM	RESISTANCE	CONNECTIONS	
Magneto			
Excitor Coil	3.82 ohms ± 10%	+To Blk	-To Ground
Lighting Coil	0.14 ohm ± 10%	+To Yellow	-To Yellow
Ignition Coil			
rimary	0.9 ohm ± 15%	+To Wht/Blu	-To Blk
Secondary	7600 ohms ± 20%	+To H.T. Lead	-To Blk
Spark Plug Cap	10,200 ohms ± 10%	+To H.T. Terminal	-To Plug Terminal

Check Voltage Regulator

1. Raise the rear of the snowmobile off the shop floor, using a safety stand. Make sure track is free to rotate.
2. Connect the main wiring harness connector to the engine connector plug.
3. Remove the voltage regulator from the chassis. Leave it connected to the wire harness, but isolate it from the chassis.
4. Set multitester selector at 100 AC volts. Connect one lead of the AC voltmeter to the yellow wire on the voltage regulator and the other tester lead to brown wire on the steering column.
5. Turn the ignition switch to the run position.
6. Start the engine and allow it to idle. The voltmeter must register approximately 10 - 15 AC volts. Grasp the throttle and accelerate slightly. As the engine rpm increases, the voltmeter must register between 12 - 15 AC volts at any rpm.

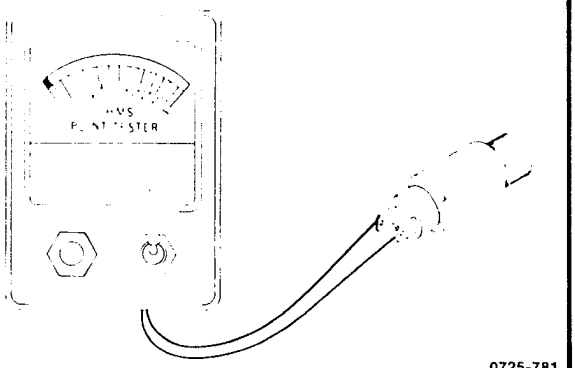
VOLTAGE REGULATOR CHECK CHART

Reading Near Zero	Reading Low (3 to 10 volts)	Reading High (over 15 volts)
Probable Cause: 1. Defective regulator (shorted) 2. Shorted harness 3. Open wire between regulator and lighting coil or loose connections 4. Open lighting coil	**Probable Cause:** 1. Defective regulator 2. Excessive load on alternator	**Probable Cause:** 1. Defective regulator (open)

Check Ignition Switch

1. Using an ohmmeter, connect one lead to each of the switch terminals.

Fig. 8-43



0725-781

2. Make sure the switch is in the OFF position. Ohmmeter must read CLOSED.

3. Rotate the key to the ON position. Ohmmeter must read OPEN.

4. If the switch does not test as specified, replace the ignition switch.

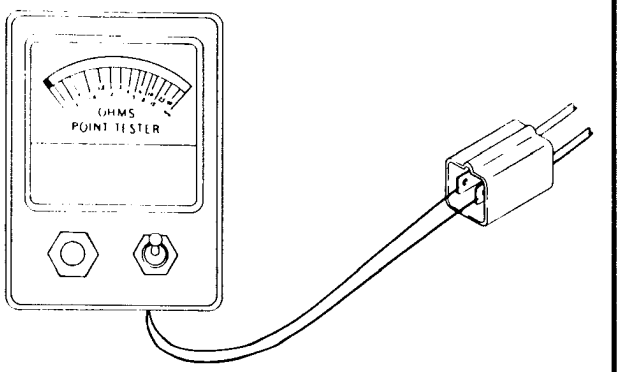
Check Throttle Safety Stop Switch

1. Disconnect the throttle safety switch harness from the main ignition harness.

2. Make sure the throttle cable is tensioned properly. The carburetors must be synchronized on dual carburetor models.

3. Connect the ohmmeter leads to the terminals of the stop switch harness.

Fig. 8-44



0725-780

4. With the stop switch in the ON position, the ohmmeter must read OPEN. If the ohmmeter reads CLOSED, check to ensure correct cable tension. If tension is correct, the switch is defective and must be replaced.

5. Move the stop switch to either OFF position. Ohmmeter must read CLOSED. If ohmmeter reads OPEN, the switch is defective and must be replaced.

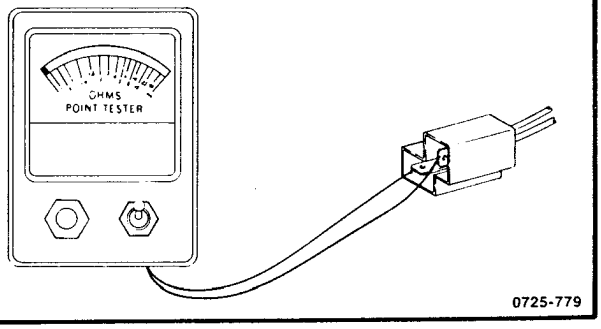
Check Brake/ Dimmer Switch

NOTE: Use steps 1-4 to check the brake switch; use steps 5-9 to check dimmer switch.

1. Disconnect the brake/dimmer switch from the main ignition harness.

2. Connect the ohmmeter leads to the two terminals of the L-shaped connector (brake switch wires).

Fig. 8-45



0725-779

3. Squeeze the brake lever. The ohmmeter must read CLOSED; release the brake lever. The ohmmeter must read OPEN.

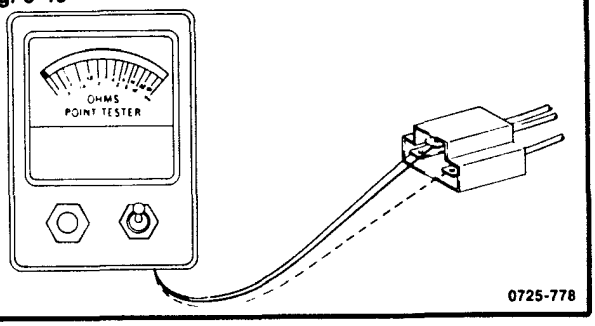
4. If the ohmmeter readings are not as specified, the switch assembly must be replaced.

5. Disconnect the dimmer switch connector from the main ignition harness.

6. Connect one lead of the ohmmeter to the terminal that matches the green wires of the main harness.

7. Connect the remaining lead to either of the two remaining terminals. Move the switch from HIGH beam to LOW beam positions. The ohmmeter will alternately read OPEN and CLOSED.

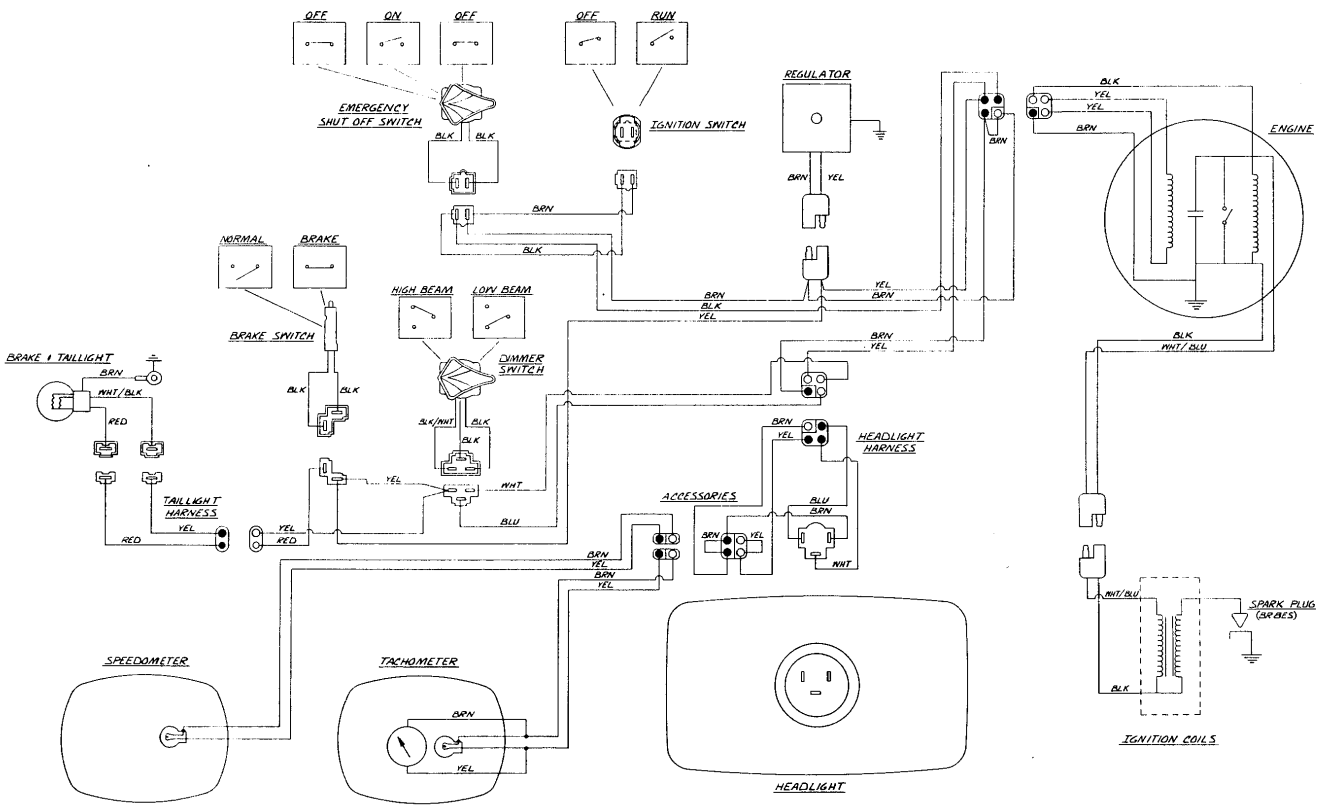
Fig. 8-46



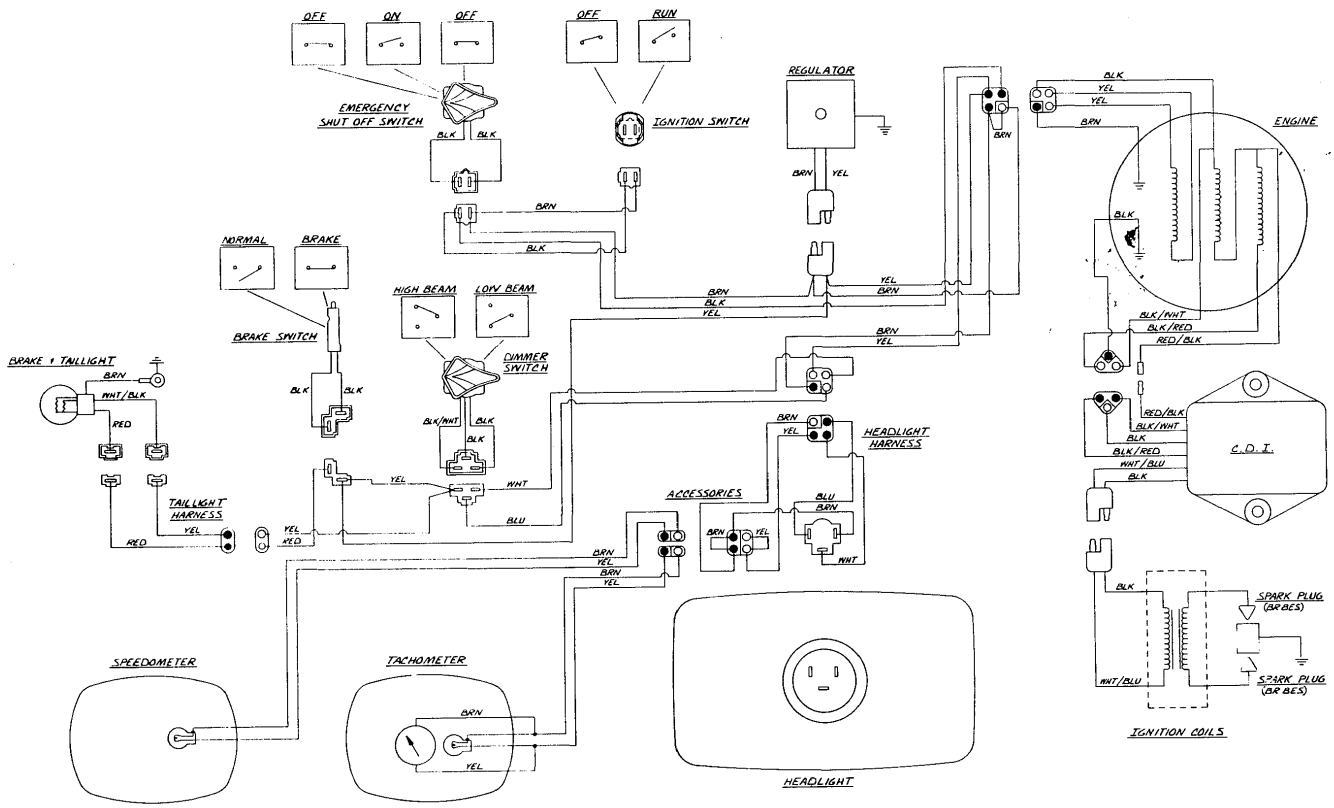
8. Leaving the one lead connected to the terminal matching the green wires, connect the other lead to the remaining open terminal. Again, move the switch from HIGH beam to LOW beam positions. The ohmmeter must alternately read OPEN and CLOSED.

9. If the dimmer switch does not test according to steps 5-8, the switch is defective and must be replaced.

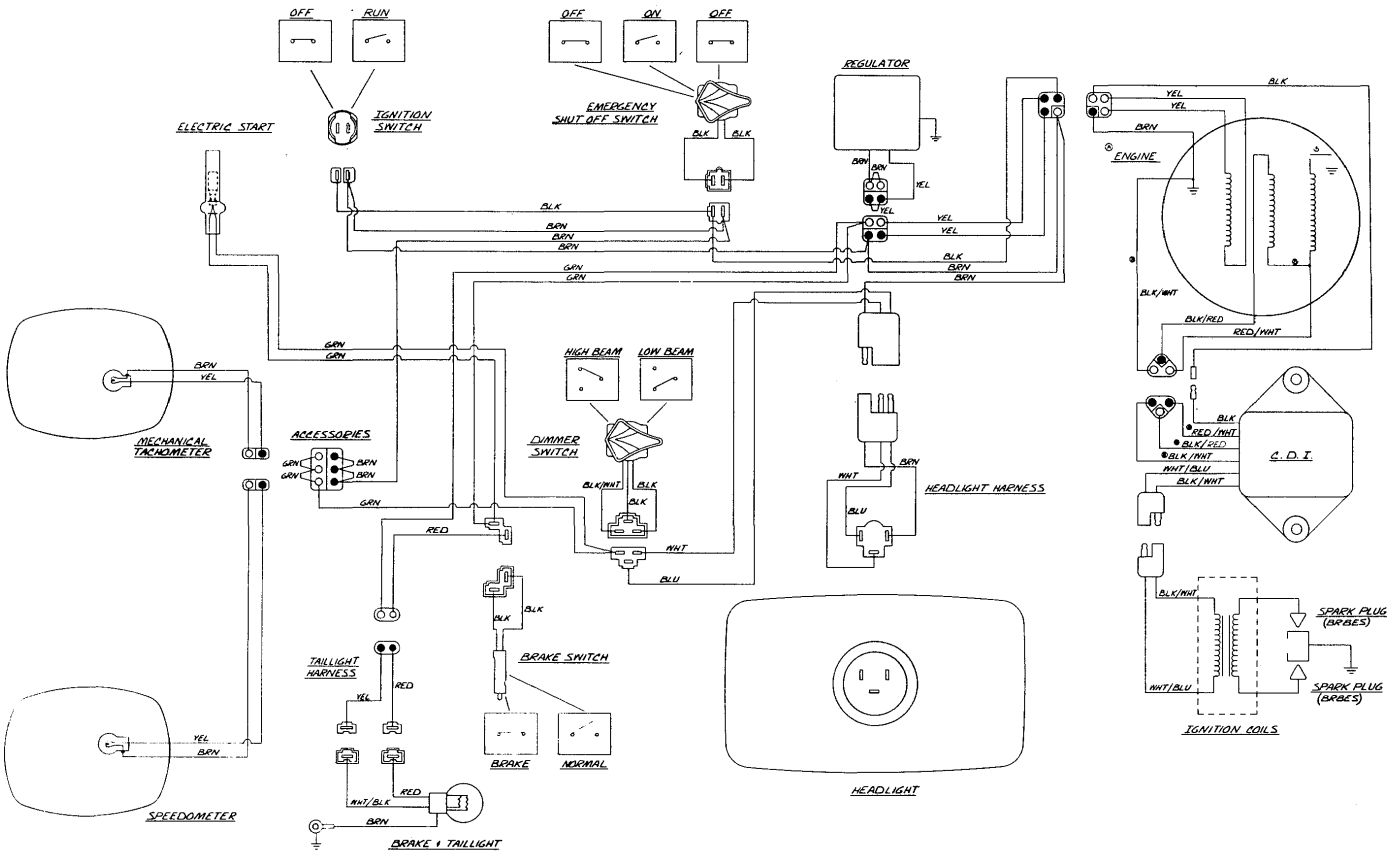
Wiring Diagram - Lynx 2000S



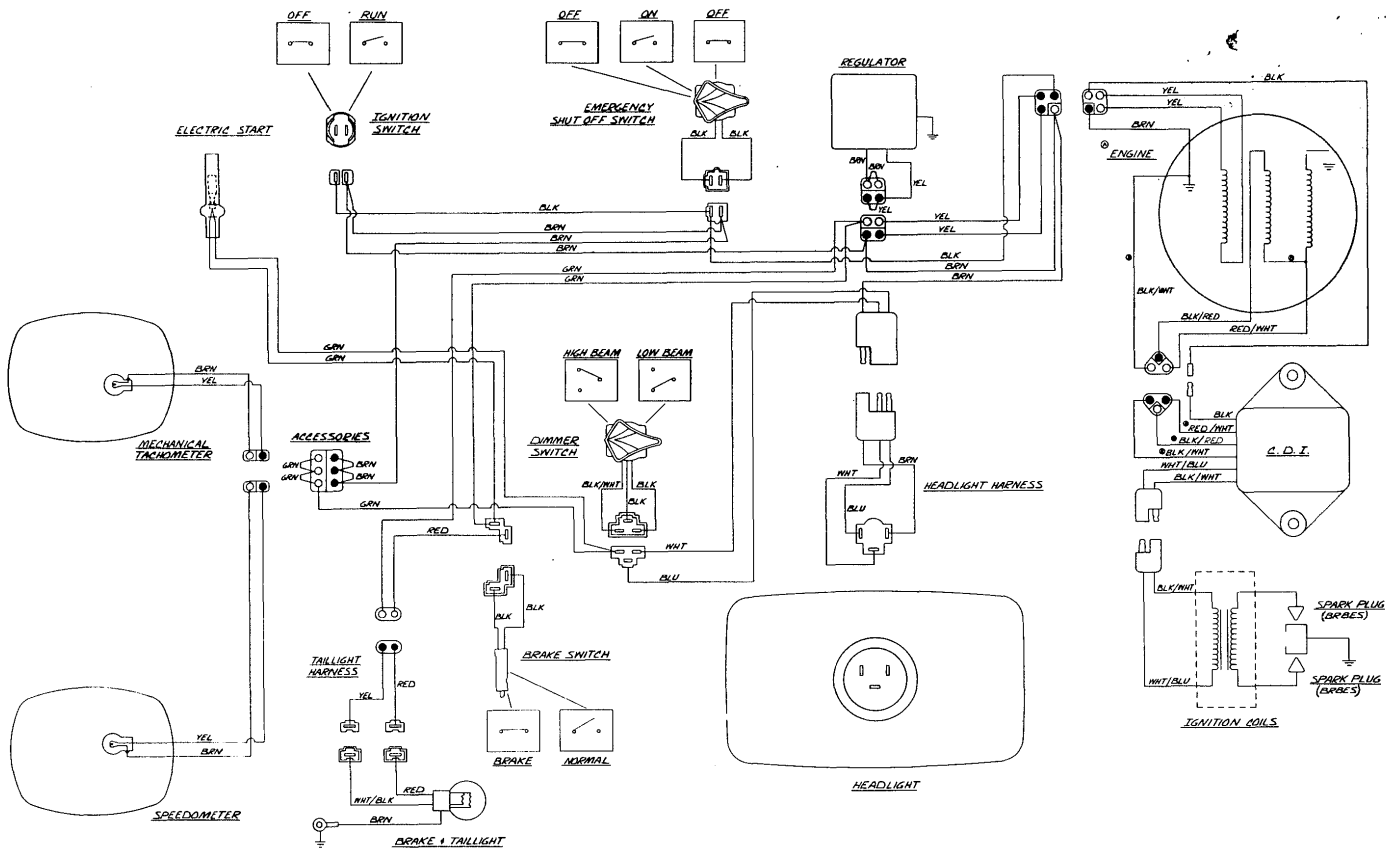
Wiring Diagram - Lynx 2000T (Nippon Denso)



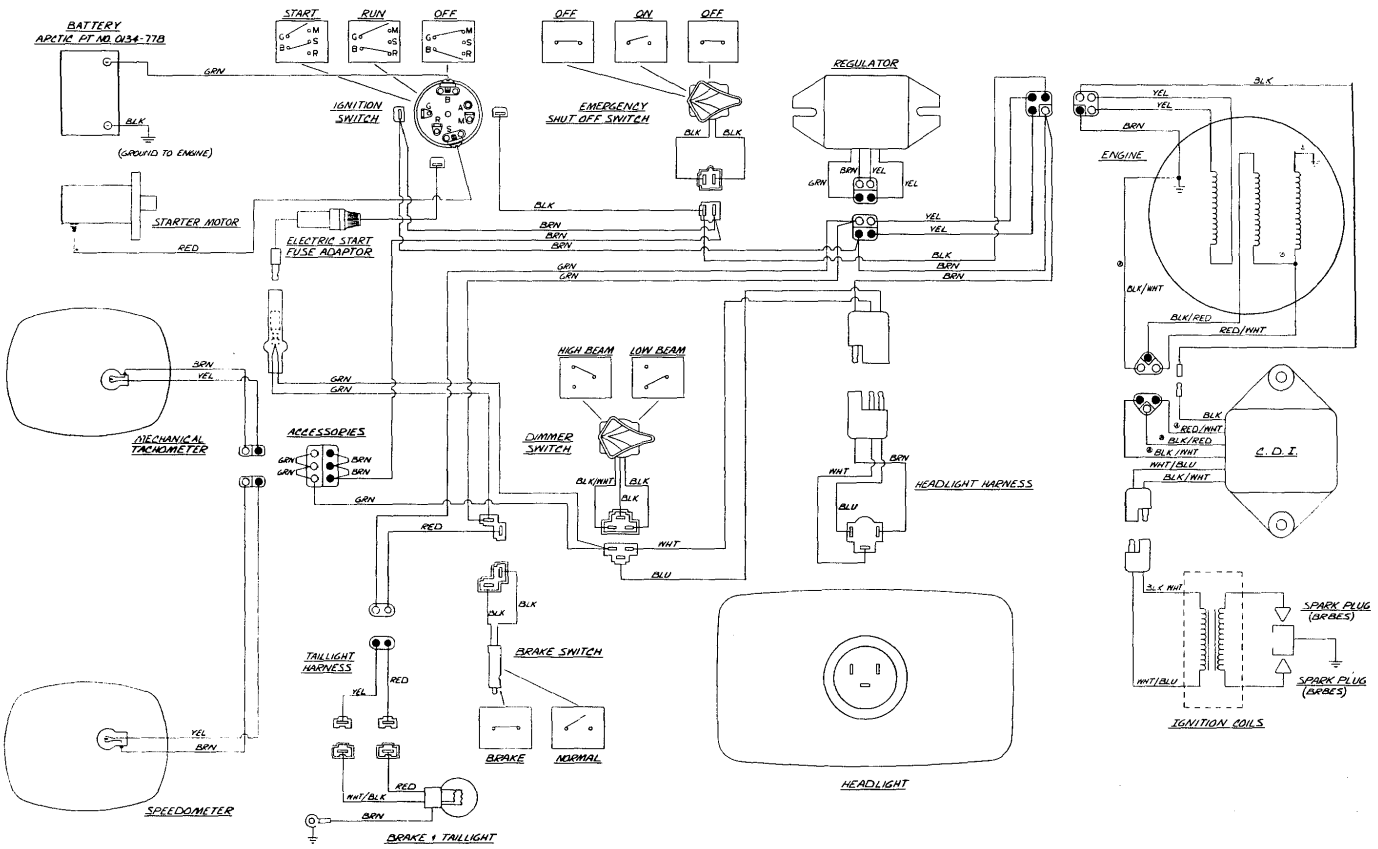
Wiring Diagram - Lynx 2000T (Kokusan)



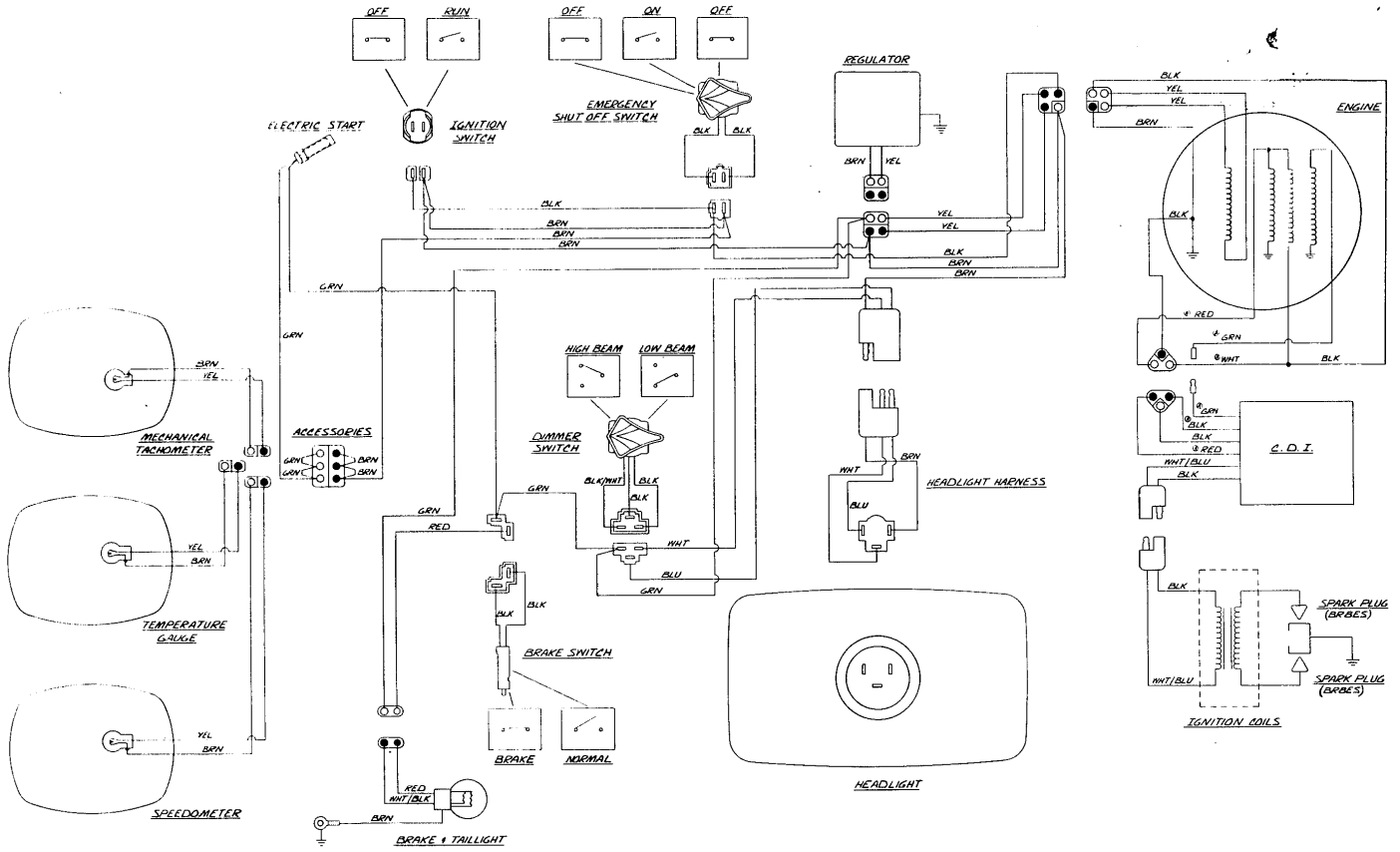
Wiring Diagram - Jag



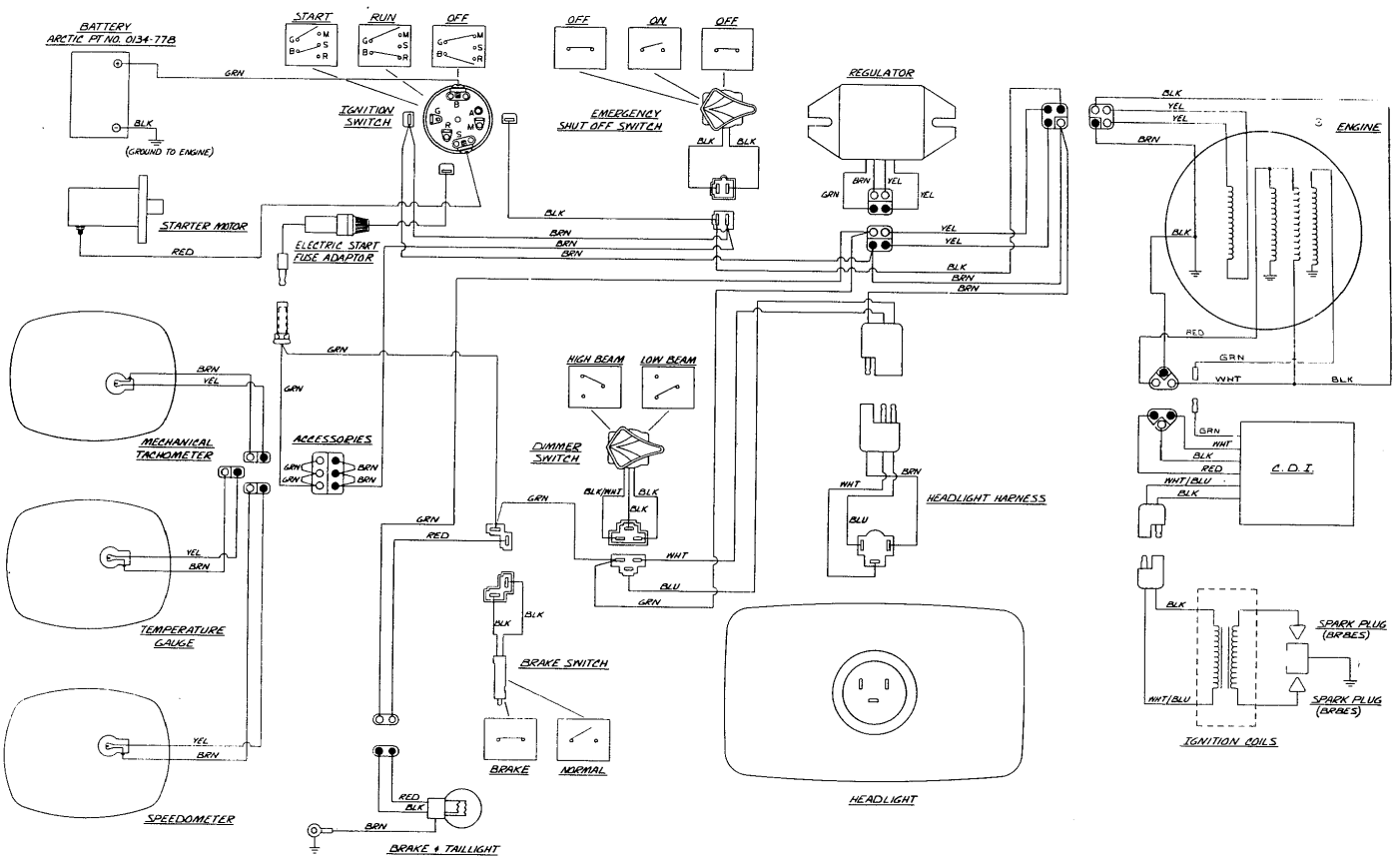
Wiring Diagram - Jag w/Accessories



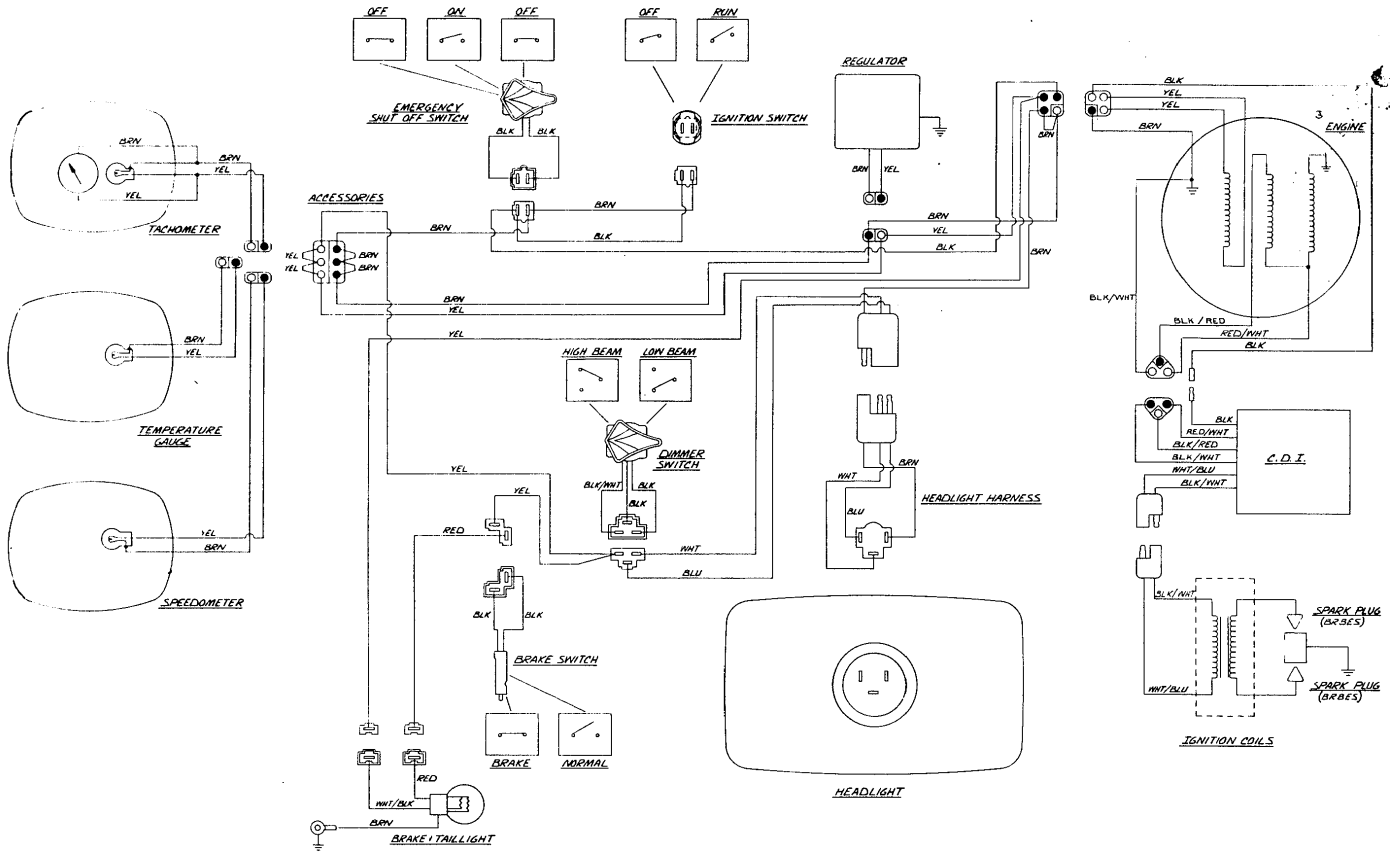
Wiring Diagram - Panther/Cheetah



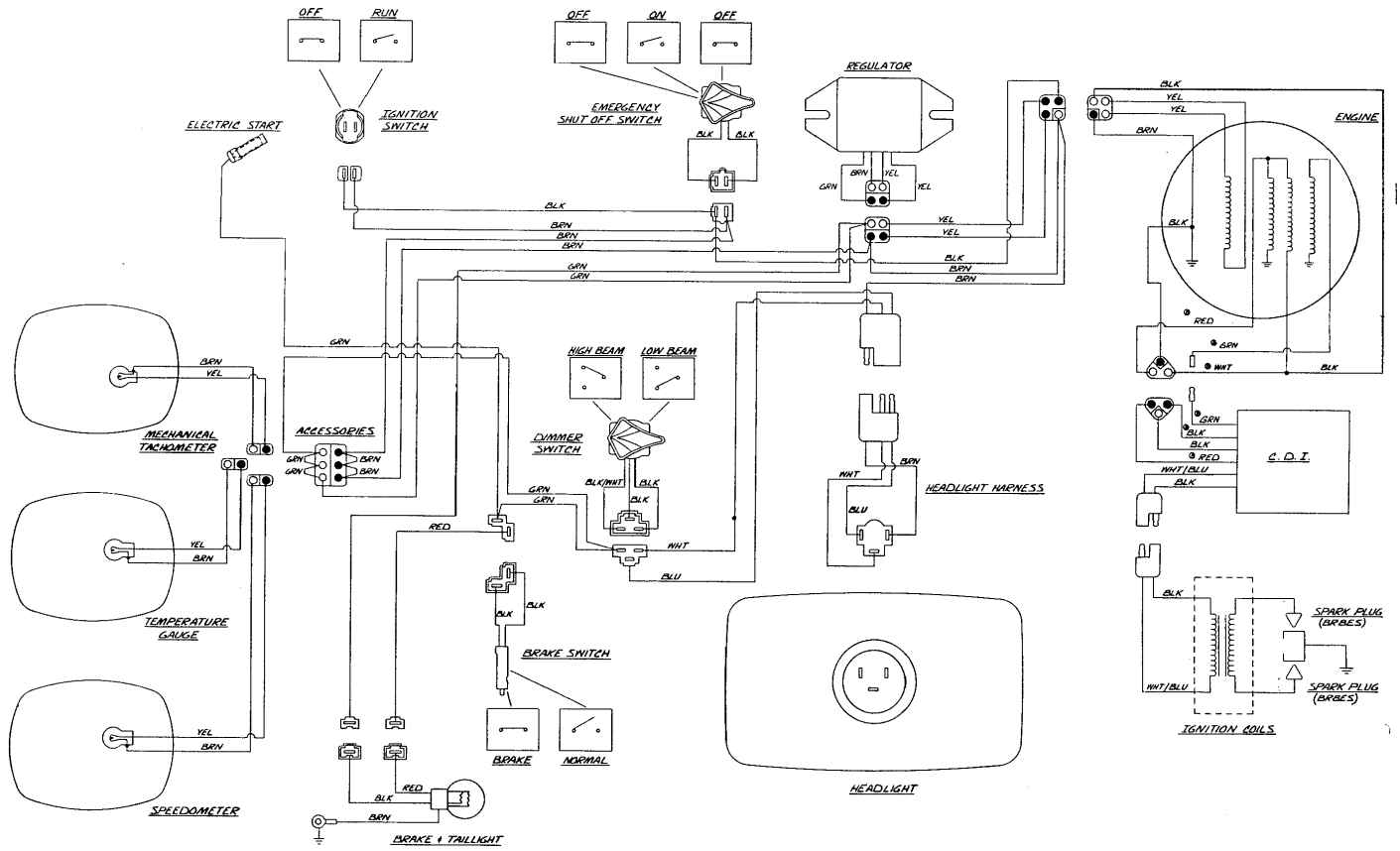
Wiring Diagram - Panther/Cheetah w/Accessories



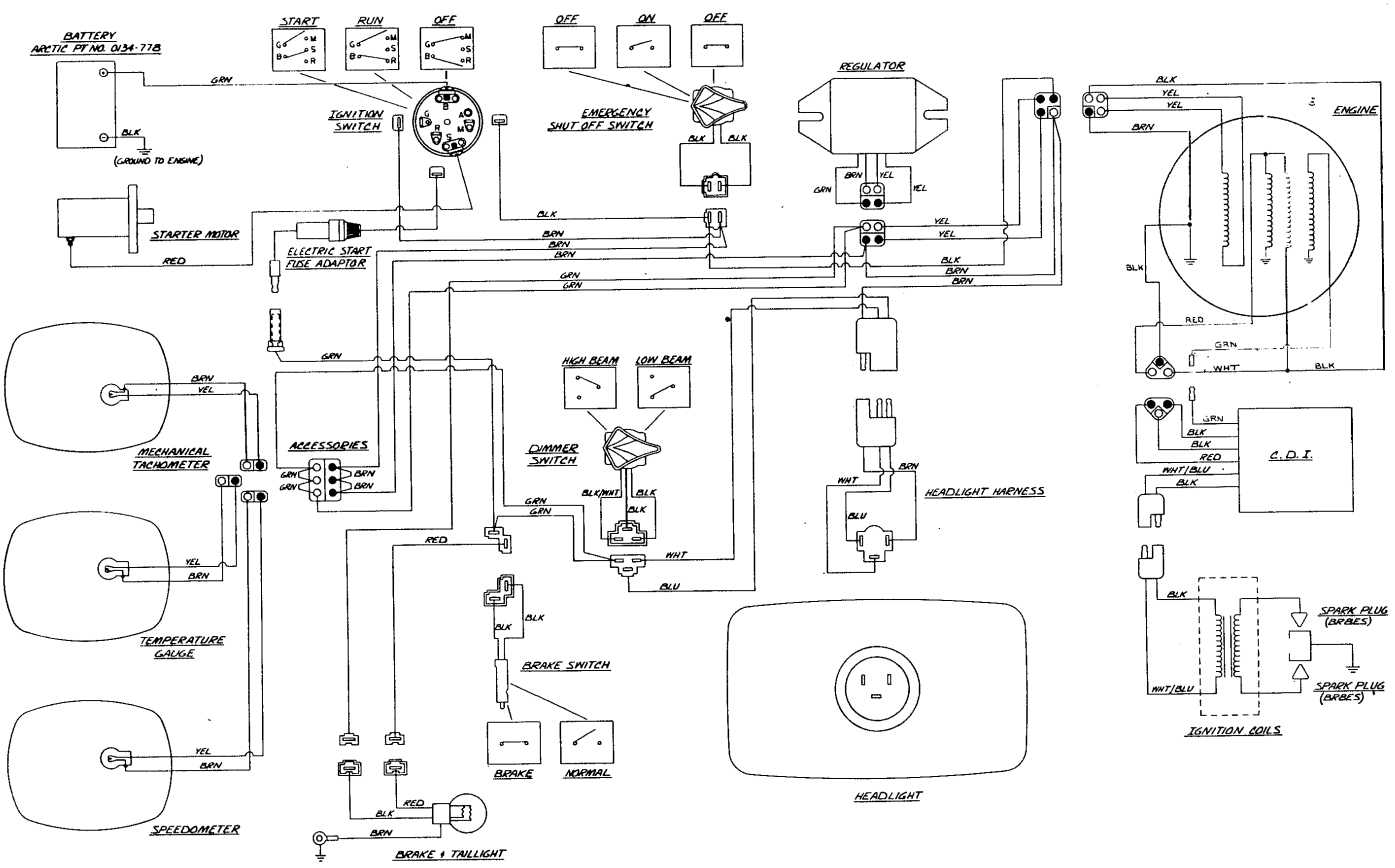
Wiring Diagram - Pantera FA



Wiring Diagram - Pantera FC



Wiring Diagram - Pantera FC w/Accessories



SECTION 9 — STEERING AND BODY

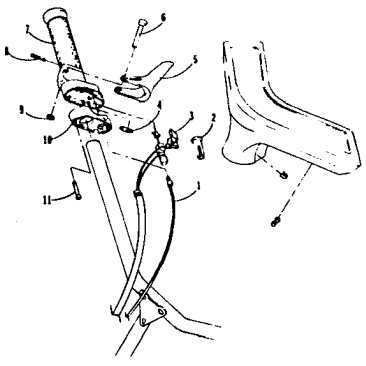
TABLE OF CONTENTS

Throttle Handle

Disassemble and Remove

1. Remove handlebar pad.
2. Remove the retaining pin and ring from the throttle handle.
3. Disconnect the end of the throttle cable from the "seat" in the throttle handle.
4. Remove the three machine screws holding the throttle handle cap to the throttle handle.
5. Slide throttle handle cap toward center of handlebar; then pull throttle safety switch out of handle.
6. Remove the spring pin securing throttle handle on handlebar.
7. Remove throttle handle from handlebar; then remove the handle cap.

Fig. 9-1



KEY

1. T. Cable
2. Sleeve
3. Safety Switch
4. Decal
5. Lever
6. Pin
7. Handle
8. Spring Pin
9. Clip
10. Cap
11. Screw

0725-479

Assemble and Install

1. Slide throttle handle cap onto the handlebar.
2. Slide throttle handle onto the handlebar, making sure that the socket for the emergency stop switch is toward rear of snowmobile. Move handle until the spring pin holes are aligned in both the handle and the handlebar; then install the spring pin.
3. Move the throttle safety switch and throttle cable into position in the throttle handle. Make sure safety switch is correctly positioned.
4. Slide throttle handle cap against throttle handle. Make sure all parts fit together properly.
5. Slide throttle cable through safety switch cover. Place end of cable in switch block.
6. Push throttle safety switch cover onto switch. Make sure all components remain seated and in place.
7. Install the three machine screws and secure cap to handle.
8. Hook end of the throttle cable in throttle lever seat.
9. Install throttle lever and "seated" throttle cable on throttle handle with pin and retaining ring.

NOTE: Compress throttle handle a few times to be sure of free movement. If throttle sticks, correct the problem before the snowmobile is operated.

10. Install handlebar pad.

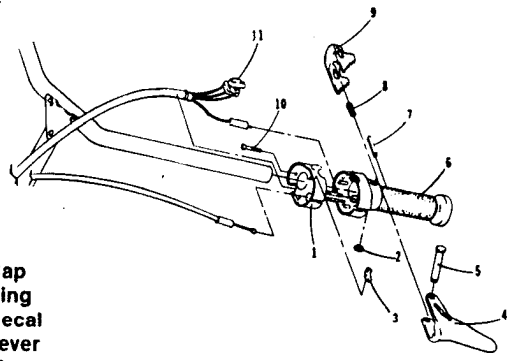
Brake Handle

Disassemble and Remove

1. Remove handlebar pad.
2. Remove the retaining ring from the pin holding the brake lever to the brake handle; then remove the pin carefully. Remove the brake lever, brake spring and brake actuator.
3. Slide brake lever and cable toward center of handlebar. Pull brake cable and seated lever out of brake handle.
4. Remove the three machine screws from brake handle cap.

5. Slide brake handle cap toward center of handlebar.

Fig. 9-2



KEY

1. Cap
2. Ring
3. Decal
4. Lever
5. Pin
6. Handle
7. Spring Pin
8. Spring
9. Actuator
10. Screw
11. Dimmer Switch

0725-480

6. Slide headlight dimmer switch and brake light switch out of brake handle.

7. Drive out spring pin holding brake handle onto handlebar.

8. Pull brake handle off handlebar.

9. Slide brake handle cap off handlebar.

Assemble and Install

1. Slide brake handle cap onto handlebar.

2. Slide brake handle onto handlebar, making sure socket for dimmer switch is toward rear of snowmobile. Align spring pin hole in handlebar with hole in handle. Drive spring pin into place.

3. Slide brake cable into position in brake handle and cap; then hook end of brake cable into brake lever.

4. Place parking brake spring and actuator in position. Secure brake handle lever and parking brake mechanism to brake handle with pin and retaining ring.

5. Move dimmer switch and brake light switch into position in the brake handle.

6. Secure switches in place by sliding brake handle cap against handle.

7. Install the three machine screws in the andle and tighten.

8. Install handlebar pad.

Remove Steering Post

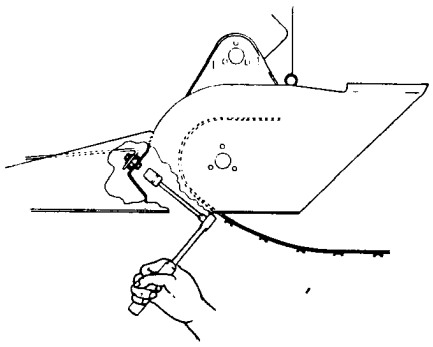
Panther, Cheetah

1. Remove the throttle handle (See: Throttle Handle, Disassemble and Remove, page 165).

2. Remove the brake handle (See: Brake Handle, Disassemble and Remove, page 165).

3. Remove the two rear motor mount lock nuts.

Fig. 9-3



0725-066

4. Remove the two front motor mount nuts.

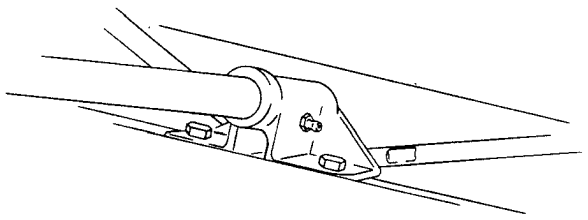
5. Remove the drive belt clutch shield.

6. Loosen the air silencer clamp and remove air silencer from carburetor.

7. Lift the engine just enough to clear lower steering post bracket.

8. Remove the two cap screws and lock nuts securing lower steering post bracket.

Fig. 9-4



0725-037

9. Turn steering post to either side and remove cap screws and lock nuts securing tie rods in place.

10. Remove the lock nuts from upper steering post bracket bolts.

11. Remove the bracket, cable clamp and bushing.

12. Remove the seat cushion; then slide tank to the rear.

13. Remove the four screws securing dash in place.

14. Move dash enough so steering post can be guided out of chassis.

15. Lift steering post clear of chassis.

Pantera

1. Remove the throttle handle (See: Throttle Handle, Disassemble and Remove, page 165).

2. Remove the brake handle (See: Brake Handle, Disassemble and Remove, page 165).

3. Remove the engine from the chassis (See: Remove Engine, page 24).

4. Remove the 5 motor plate cap screws.

5. Remove the cap screws, washers and lock nuts securing lower steering post to tunnel bracket.

6. Turn steering post to either side and remove cap screw and lock nut securing each tie rod in place.

7. Remove both the gas cap and gas tank seal from the gas tank.

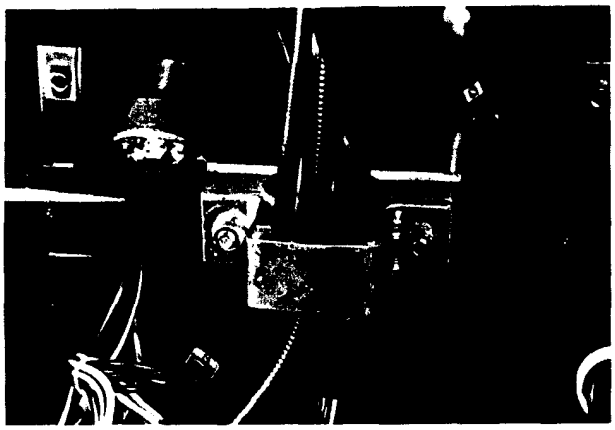
8. Remove the seat cushion from the tunnel.

9. Remove the 4 machine screws that secure dash in place.

10. Remove the knurled nuts from both the choke and ignition switch; then remove dash so upper steering post bracket can be removed.

11. Remove the two lock nuts from bracket carriage bolts.

Fig. 9-5



A216

12. Remove, in order, the cable clamp, clamp and bushings.

13. Lift steering post clear of chassis.

Jag

1. Remove the throttle handle (See: Throttle Handle, Disassemble and Remove, page 165).

2. Remove the brake handle (See: Brake Handle, Disassemble and Remove, page 165).

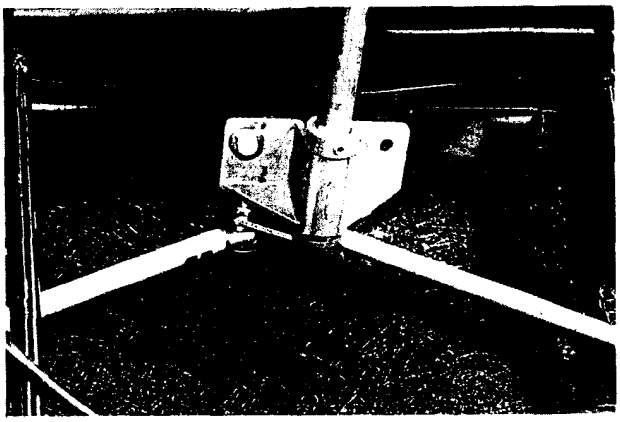
3. Remove the two rear motor mount lock nuts.

4. Remove the three front motor mount nuts.

5. Lift the engine just enough to clear lower steering post bracket.

6. Remove the cap screw and lock nut securing lower steering post bracket.

Fig. 9-6



A034

7. Turn steering post to either side and remove cap screws and lock nuts securing tie rods in place.

8. Remove the lock nuts from upper steering post bracket bolts.

9. Remove the cable clamp.

Lift steering post clear of chassis.

Lynx

1. Remove the throttle handle (See: Throttle Handle, Disassemble and Remove, page 165).

2. Remove the brake handle (See: Brake Handle, Disassemble and Remove, page 165).

3. Remove the engine and motor plate from the front end (See: Lynx Engine Removal, steps 5-10, page 22).

4. Remove the two cap screws and lock nuts securing the lower steering support bracket to the front end.

5. Remove the two cap screws and lock nuts securing the upper steering post bracket to the steering support.

6. Note the position of the tie rods in relation to the steering post brackets; then remove the two cap screws and lock nuts securing the tie rods to the steering post.

7. Lift the steering post free of the chassis.

Install Steering Post

Panther, Cheetah

1. Guide steering post into position in the chassis.

2. Install the bracket, cable clamp and bushing; then install the two nuts on the upper bracket bolts. DO NOT TIGHTEN.

3. Place the tie rods in position on lower steering arm and secure in place with cap screws and lock nuts. Tighten the lock nuts to 2.9 - 3.6 kg-m or 21 - 26 ft-lb.

NOTE: Tie rods must be on lower side of lower steering post tie rod bracket.

4. Install the cap screws and lock nuts that secure lower steering post bracket in position. Tighten the lock nuts to 2.9 - 3.6 kg-m or 21 - 26 ft-lb. Lubricate the lower bracket grease fitting.

5. Now tighten the upper post bracket lock nuts to 0.7 kg-m or 5 ft-lb.

6. Set the engine assembly in place.

7. Install the two front motor mount nuts and the two rear motor mount nuts; then tighten lock nuts to 2.9 - 3.6 kg-m or 21 - 26 ft-lb.

NOTE: Be sure to replace any shims that were removed earlier.

8. Install the air silencer on the carburetor and tighten air silencer clamp.

9. Move the console into place and secure with four screws.

10. Move tank into position.

11. Install the seat cushion.

12. Install the brake handle (See: Brake Handle, Assemble and Install, page 166).

13. Install the throttle handle (See: Throttle Handle, Assemble and Install, page 165).

14. Check ski alignment (See: Ski Alignment, page 177).

Pantera

1. Place steering post in position in the chassis.

2. Install the cap screws with washers through the lower steering post bracket and the front end; then install lock nuts. DO NOT TIGHTEN.

NOTE: At this time lubricate the lower steering post bracket.

3. Install the steering post bushings around the handlebar at the upper bracket mount. Install bushing clamp and cable clamp on upper bracket bolts; then install the two lock nuts. Tighten to 1.4 kg-m or 10 ft-lb.

4. Move dash into position. Install the four screws which secure dash in place.

5. Insert choke and ignition switch through console; then install knurled nuts and tighten.

6. Install seat cushion on tunnel.

7. Install the gas tank seal over filler neck; then install the gas cap.

8. Install the cap screws and lock nuts for the tie rods. Tighten lock nuts to 2.9 - 3.6 kg-m or 21 - 26 ft-lb.

NOTE: Tie rods must be on lower side of steering post tie rod bracket.

9. Move the engine motor plate into position and secure with cap screws and washers. Tighten the cap screws to 3.9 kg-m or 28 ft-lb.

10. Install the brake handle (See: Brake Handle, Assemble and Install, page 166).

11. Install the throttle handle (See: Throttle Handle, Assemble and Install, page 165).

Jag

1. Place steering post in position in chassis.

2. Install the cap screw through the MAG side hole in the lower steering post bracket and the front end; then install lock nut. DO NOT TIGHTEN.

NOTE: Lubricate the lower steering post bracket.

3. Install the cable clamp on upper bracket bolts; then install the two lock nuts. Tighten to 0.7 kg-m or 5 ft-lb.

4. Install the cap screws and lock nuts for the tie rods. Tighten lock nuts to 2.9 - 5.6 kg-m or 21 - 26 ft-lb.

NOTE: Tie rods must be on lower side of lower steering post tie rod bracket.

5. Move the engine assembly into position and install washers and lock nuts on front motor mount studs. DO NOT TIGHTEN.

NOTE: Be sure to replace any shims that were removed earlier.

6. Install the lock nuts on the rear motor mount studs. Tighten nuts to 2.9 - 3.6 kg-m or 21 - 26 ft-lb. Tighten front motor mounts at this time.

7. Install the throttle handle (See: Throttle Handle, Assemble and Install, page 165).

8. Install the brake handle (See: Brake Handle, Assemble and Install, page 166).

9. Check ski alignment (See: Ski Alignment, page 177).

Lynx

1. Place the steering post in position on the chassis.

2. Slide the throttle handle on the handlebar and secure with the spring pin.

3. Slide the brake handle onto the handlebar and secure with a spring pin.

4. Move the tie rods into place and secure to the steering post with two cap screws and lock nuts. Tighten the lock nuts to 4.1 kg-m or 30 ft-lb.

5. Install the upper and lower steering post bracket cap screws and lock nuts. Tighten the lock nuts to 2.8 kg-m or 20 ft-lb.

NOTE: Lubricate the lower steering post bracket.

6. Install the engine and motor plate (See: Install Lynx Engine, steps 2-7, pages 64-67).

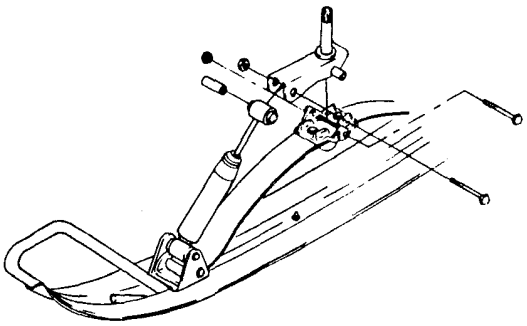
Disassemble Ski

Panther, Cheetah, Jag

1. Remove the lock nut and cap screw holding ski assembly to ski spindle.

2. Remove the lock nut and cap screw holding top of shock absorber to the ski spindle.

Fig. 9-7



0725-168

3. Remove the ski.

4. Remove the lock nut and cap screw holding shock to shock mount of ski.

5. Place ski in a vise and compress spring approximately 3 cm or one inch.

6. Remove cap screw and lock nut holding front of spring and spring slide saddle between the mount bracket. Slowly release the vise pressure.

7. Remove cap screw and lock nut holding spring to rear mount bracket.

8. Remove rear ski bumper.

Pantera

1. Remove the lock nut and cap screw holding ski assembly to ski spindle.

2. Remove the ski and account for the rubber damper.

3. Remove the two cap screws and lock nuts securing shock absorber in place.

4. Remove the shock absorber and account for the flat washers and shock bushings.

5. Place ski in a vise and compress spring approximately 3 cm or 1 inch.

6. Remove the cap screw and lock nut holding front of spring and spring slide saddle between the mount bracket. Slowly release the vise pressure.

7. Remove the cap screw and lock nut holding spring to rear mount bracket.

8. Remove the rear ski bumper.

9. Remove the spring assembly from the ski.

10. Remove the cap screws and lock nuts securing the saddle, shock bracket and bump-out block to the spring.

11. Slide the front sleeve out of the spring slide saddle.

12. Inspect all the front suspension components for any defects or damage. Replace components if conditions require replacement or repair.

Lynx

1. Remove the cap screw and lock nut holding ski assembly to the spindle.

2. Remove the ski.

3. Place ski in a vise and compress spring approximately 3 cm or one inch.

4. Remove the cap screw and lock nut holding front of spring and spring slide saddle between the mount bracket. Slowly release the vise pressure.

5. Remove the cap screw and lock nut holding spring to rear mount bracket.

6. Remove rear ski bumper.

7. Remove spring bumper block, liner and saddle from the ski spring.

8. Slide the sleeve and the spring slide saddle off the ski spring.

9. Remove the lock nut and washer from the skag mounting stud; then pry the center of the skag away from the bottom until the mounting stud is clear of the hole. Using a wooden block, drive the skag forward until the rear of the skag releases from the hole in the ski. Slide skag out of front mounting hole.

Assemble Ski

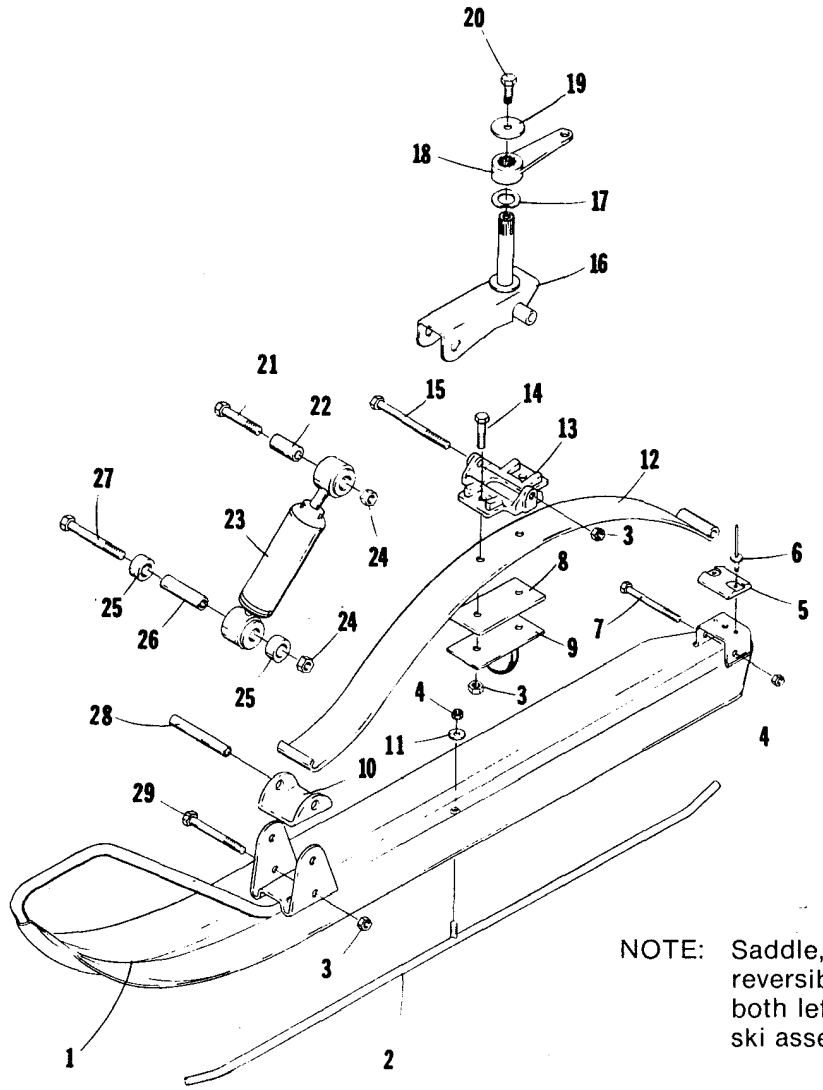
Panther, Cheetah, Jag

1. Rivet the rear ski bumper to the ski.
2. Place the saddle on the ski spring. Insert the two cap screws from the top through the saddle and spring.

NOTE: The ski saddle may be reversed for use on either side. Be sure threaded portion of the saddle is to the inside.

3. Slide the liner and ski block onto the cap screws and secure in place with lock nuts. Tighten the lock nuts to 2.9 - 3.6 kg-m or 21 - 26 ft-lb.

Fig. 9-8



KEY

1. Ski
2. Skag
3. Lock Nut
4. Lock Nut
5. Ski Bumper
6. Rivet
7. Cap Screw
8. Liner
9. Block
10. Spring Slide Saddle
11. Washer
12. Spring
13. Saddle
14. Cap Screw
15. Cap Screw
16. Spindle
17. U-Bend Washer
18. Spindle Arm
19. Washer
20. Cap Screw
21. Cap Screw
22. Upper Sleeve
23. Shock Absorber
24. Lock Nut
25. Spacer
26. Lower Sleeve
27. Cap Screw
28. Sleeve
29. Cap Screw

NOTE: Saddle, item 13, is reversible for use on both left and right ski assemblies.

0700-024

4. Install end of spring in mount bracket at rear of ski and secure with cap screw and lock nut. Tighten lock nut to 2.8 kg-m or 20 ft-lb.

NOTE: Lock nut is to be positioned on inside of ski. Do not overtighten or spring binding will result.

5. Place spring slide saddle and spring in the front mount bracket; then insert metal sleeve through slide saddle.

6. Place ski in a vise and compress spring until cap screw and lock nut can be installed. Install cap screw and lock nut; then tighten to 2.9 - 3.6 kg-m or 21 - 26 ft-lb. Release tension.

NOTE: Lock nut is to be positioned on inside of ski.

7. Slide long sleeve through the stationary end of the shock absorber and place a plastic bushing on each end of the long sleeve.

NOTE: Flat end surface of the plastic bushing must contact shock absorber; radiused end surface must contact the shock mounting bracket.

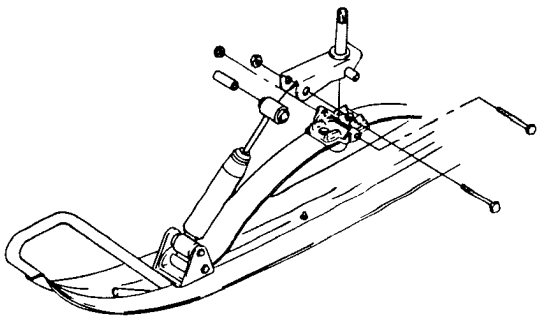
8. Place shock assembly into position between the shock mounting bracket and secure in place with bolt and lock nut. Tighten the bolt to 4.4 - 5.3 kg-m or 32 - 38 ft-lb.

NOTE: Lock nut must be positioned on inside of ski.

9. Place ski assembly in position on spindle and secure in place with cap screw. Tighten cap screw to 2.9 - 3.6 kg-m or 21 - 26 ft-lb. Thread lock nut onto cap screw and tighten to 2.9 - 3.6 kg-m or 21 - 26 ft-lb.

NOTE: Threaded hole in ski saddle is to be positioned to the inside, and therefore, the cap screw must be started from the outside of the saddle.

Fig. 9-9



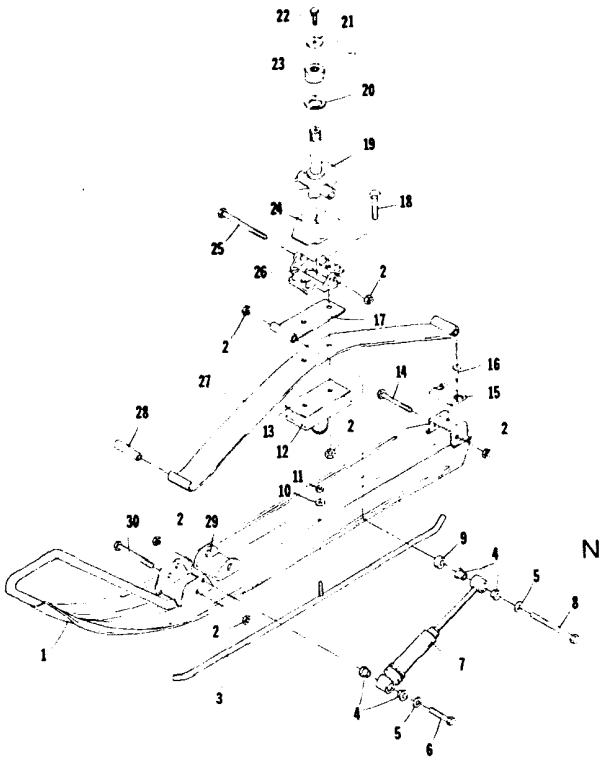
0725-168

10. Slide a short sleeve through the moveable end of the shock absorber and position the end between the spindle mounting bracket. Secure in place with cap screw and lock nut, making sure the bolt is started from the outside. Tighten the bolt to 4.4 - 5.3 kg-m or 32 - 38 ft-lb.

11. Insert the front end of the skag in the front mounting hole. Bend the skag toward the rear of the ski until the end of the skag will slide into the rear hole. Using a wooden block, drive the skag to the rear until the mounting stud aligns with the mounting hole. Remove the wooden block and secure the skag with a flat washer and a lock nut.

12. Check ski alignment.

Fig. 9-10



KEY

1. Ski
2. Lock Nut
3. Skag
4. Bushing
5. Washer
6. Cap Screw
7. Shock Absorber
8. Cap Screw
9. Spacer
10. Washer
11. Lock Nut
12. Bump-out Block
13. Liner
14. Cap Screw
15. Bumper
16. Rivet
17. Bracket
18. Cap Screw
19. Spindle
20. U-bend Washer
21. Washer
22. Cap-lock Screw
23. Spindle Arm
24. Damper
25. Cap Screw
26. Saddle
27. Spring
28. Front Sleeve
29. Spring Slide Saddle
30. Cap Screw

NOTE: Saddle, item 26, is reversible for use on both left and right ski assemblies.

0700-049

1. Rivet the ski bumper to the ski.

2. Place the saddle and shock bracket on the top side of the leaf spring.

NOTE: The saddle is reversible for use on both left and right ski assemblies. Threaded portion of saddle is to be positioned to the inside of the ski.

3. Place the liner and bump-out block in place below the spring. Install the two cap screws and lock nuts to hold spring components in place. Tighten the lock nuts to 2.9 - 3.6 kg-m or 21 - 26 ft-lb.

4. Place the spring slide saddle on the front of the spring; then install front sleeve on spring saddle.

5. Place the assembled spring into position on the ski. Secure the rear end of spring to the ski with a cap screw and lock nut. Tighten the lock nut to 2.8 kg-m or 20 ft-lb.

6. Place the ski in a vise and compress spring until the front spring mounting bolt can be inserted through the ski spring slide saddle and front sleeve; then install the lock nut. Tighten the lock nut to 2.9 - 3.6 kg-m or 21 - 26 ft-lb.

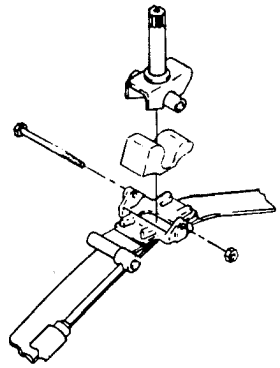
7. Slide the plastic bushings into the end of the shock absorber. Secure the stationary end of the shock absorber to the front ski bracket with a cap screw, flat washer and lock nut. Tighten the lock nut to 2.9 - 3.6 kg-m or 21 - 26 ft-lb.

8. Secure the moveable end of the shock absorber to the shock bracket with a cap screw, flat washer and lock nut. Be sure to install the spacer between the bracket and the rubber bushing. Tighten the lock nut to 2.9 - 3.6 kg-m or 21 - 26 ft-lb.

NOTE: The shock must always be positioned to the inside of the ski. The ski bracket and shock bracket may be interchanged from side to side.

9. To install the ski, place a rubber damper between the spindle and ski saddle.

Fig. 9-11



0725-325

10. Place ski assembly in position.

NOTE: Threaded hole in ski saddle is to be positioned to the inside, therefore, start the cap screw from the outside of the saddle.

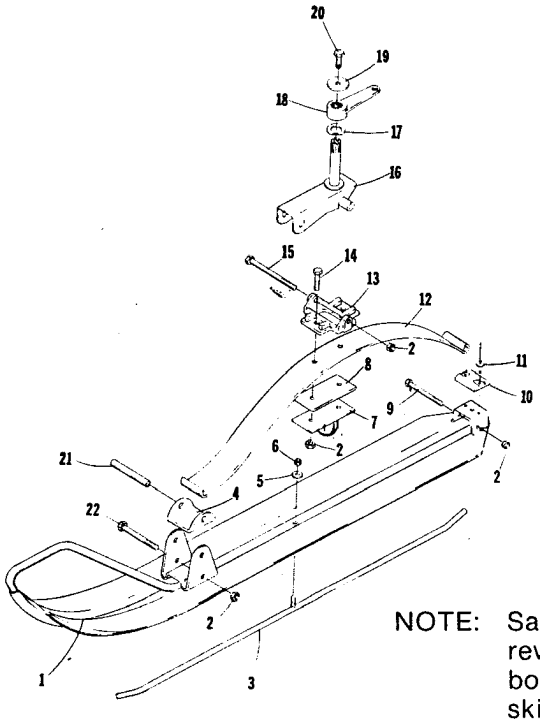
11. Apply low temperature grease to the non-threaded portion of the cap screw. Secure ski in place with cap screw. Tighten to 2.9 - 3.6 kg-m or 21 - 26 ft-lb. Thread lock nut onto cap screw and tighten to the same specifications.

12. Insert the front end of the skag in the front mounting hole. Bend the skag toward the rear of the ski until the end of the skag will slide into the rear hole. Using a wooden block, drive the skag to the rear until the mounting stud aligns with the mounting hole. Remove the wooden block and secure the skag with a flat washer and a lock nut.

13. Check ski alignment.

Lynx

Fig. 9-12



KEY

1. Ski
2. Lock Nut
3. Skag
4. Saddle
5. Washer
6. Lock Nut
7. Block
8. Liner
9. Cap Screw
10. Ski Bumper
11. Rivet
12. Spring
13. Saddle
14. Cap Screw
15. Cap Screw
16. Spindle
17. Wave Washer
18. Spindle
19. Washer
20. Cap Screw
21. Front Sleeve
22. Cap Screw

NOTE: Saddle, item no. 13, is reversible for use on both left and right ski assemblies.

0700-118

1. Rivet the rear ski bumper to the ski.

2. Insert the front end of the skag in the front mounting hole. Bend the skag toward the rear of the ski until the end of the skag will slide into the rear hole. Using a wooden block, drive the skag to the rear until the mounting stud aligns with the mounting hole. Remove the wooden block and secure the skag with a flat washer and a lock nut.

3. Place the saddle on the spring. The saddle is reversible for use on both sides. Position the threaded portion of the saddle to the inside of the ski.

4. Place the liner and bumper block in position on the ski spring; then secure liner, block and saddle to the ski with two cap screws and lock nuts. Tighten the lock nuts to 2.9 - 3.6 kg-m or 21 - 26 ft-lb.

5. Install rear end of spring in rear mount bracket and secure with a cap screw and lock nut. Tighten the lock nut to 2.8 kg-m or 20 ft-lb.

NOTE: Lock nut is to be positioned to the inside of the ski.

6. Place spring slide saddle and sleeve on the spring; then position the assembly in the front mount bracket.

7. Place ski in a vise and compress spring until cap screw and lock nut can be installed. Install cap screw and lock nut; then tighten to 2.9 - 5.6 kg-m or 21 - 26 ft-lb. Release tension.

NOTE: Lock nut is to be positioned on inside of ski.

8. Place ski assembly in position on the spindle and secure with a cap screw. Tighten the cap screw to 2.9 - 3.6 kg-m or 21 - 26 ft-lb. Thread lock nut onto cap screw and tighten to 2.9 - 3.6 kg-m or 21 - 26 ft-lb.

NOTE: Threaded hole in ski saddle is to be positioned to the inside, and therefore, the cap screw must be started from the outside of the saddle.

9. Check ski alignment (See: Ski Alignment, page 177).

Remove Tie Rods

Panther, Cheetah, Pantera, Jag

1. Remove the engine (See: Section Four - Remove Engine, pages 22-24).

NOTE: To aid in removal of tie rods, the engine should be removed.

2. Remove the lock nut and cap screw securing tie rod ends to spindle arms.

3. Turn steering post to either side; then remove lock nut and cap screw securing tie rod to steering post.

4. Remove tie rod assemblies from front end.

5. Loosen the tie rod adjusting bolt jam nuts.

6. Remove tie rod and tie rod end from the adjusting bolt.

7. Remove the jam nuts from adjusting bolt.

Lynx

1. Remove the engine (See: Remove Engine, steps 1-10, page 22).

2. Note the position of the tie rods in relation to the mounting arms on the steering post and the spindle arms. This will ensure correct steering operation when re-installed.

3. Remove the cap screws and lock nuts securing the tie rods in place.

4. Remove the tie rod assemblies from the front end.

5. Loosen the tie rod end jam nuts.

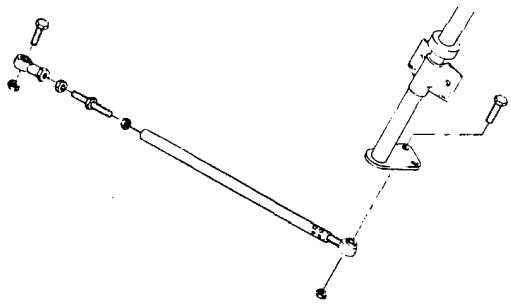
6. Rotate the tie rod ends and remove from the tie rods.

7. Remove the jam nuts from the tie rod ends.

Install Tie Rods

Panther, Cheetah, Pantera, Jag

Fig. 9-13



0725-306

1. Install the jam nuts on the adjusting bolt.

NOTE: Since the adjusting stud has both right and left handed thread, the jam nuts can be installed only one way.

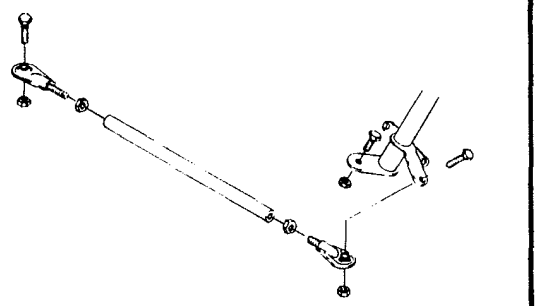
2. Install the tie rod on the side of the adjusting bolt with the brass colored jam nut.
3. Install the tie rod end on the remaining end of the adjusting stud.
4. Place tie rod assemblies in position.

NOTE: Make sure adjusting bolt is toward spindle arm.

5. Secure tie rod to steering post with cap screw and lock nut. Tighten the lock nut to 2.9 - 3.6 kg-m or 21 - 26 ft-lb.
6. Secure remaining end of tie rod to spindle arm with a cap screw and lock nut. Tighten lock nut to 2.9 - 3.6 kg-m or 21 - 26 ft-lb.
7. Check ski alignment (See: Ski Alignment, page 177).

Lynx

Fig. 9-14



0725-518

1. Thread the jam nuts onto the tie rod ends.
2. Thread the tie rod ends about halfway into the tie rods.
3. Place the tie rod assemblies in position and secure with cap screws and lock nuts. Tighten the lock nuts to 2.9 - 3.6 kg-m or 21 - 26 ft-lb. Make sure the tie rods are in the correct position. Turn the handlebar to both extreme positions and check for binding or interference with chassis.
4. With the engine out of the chassis, check the ski alignment (See: Ski Alignment, page 177).
5. When the ski alignment is correct, tighten the tie rod jam nuts.
6. Install the engine (See: Install Lynx Engine, page 64-65).

Remove Spindles

1. It may be necessary to remove drive clutch from engine if PTO side spindle is to be replaced (See: Drive Clutch Removal, pages 88-89).
2. Remove the cap screw and flat washer securing spindle arm to the spindle.

3. Pull spindle arm off spindle; then slide U-bend washers off spindle.

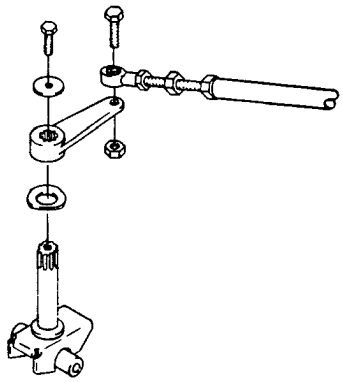
4. Block the front end up until the entire ski (spindle) can be removed from the spindle mount.

NOTE: The spindle may stick in the spindle mount. Use a 15 mm diameter brass punch and drive spindle out of mount.

5. Remove lock nut and cap screw holding spindle to ski saddle.

NOTE: The cap screw is threaded through the ski saddle. Therefore, the lock nut must be removed before the cap screw can be moved.

Fig. 9-15



0725-305

Install Spindles

1. Slide the spindle into position in the spindle mount.

2. Place any washers removed earlier on the spindle shaft; then slide spindle arm onto splined spindle shaft.

3. Secure spindle arm to spindle shaft with cap screw and flat washer. Tighten to 2.8 kg-m or 20 ft-lb.

4. Place rubber damper on ski spindle (Pantera models only).

5. Place ski in position and secure in place with a cap screw. Tighten the cap screw to 2.9 - 3.6 kg-m or 21 - 26 ft-lb. Thread lock nut onto cap screw and tighten to 2.9 - 3.6 kg-m or 21 - 26 ft-lb.

NOTE: Threaded hole in ski saddle is to be positioned to the inside, and therefore, the cap screw must be started from the outside of the saddle.

6. Check ski alignment (See below).

7. Install the drive clutch if it was removed (See: Install Drive Clutch, pages 90-91).

Ski Alignment

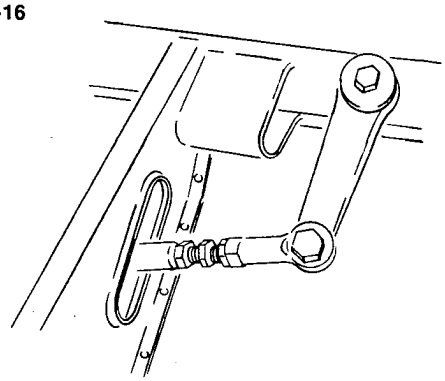
Ski alignment must be checked and adjusted if necessary whenever any component of the steering is replaced. Ski alignment usually will not change unless a rock or other hard object is hit during snowmobile operation. To ensure correct handling, ski alignment must be checked whenever the machine is being serviced.

Panther, Cheetah, Pantera, Jag

1. Position the handlebar straight forward in relation to the machine.

2. Loosen the adjusting stud jam nuts on both tie rods.

Fig. 9-16

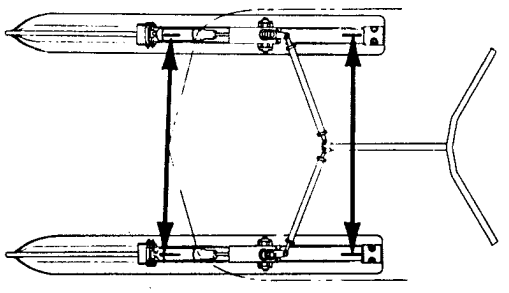


0725-072

3. Raise the front end of the snowmobile about 2 cm off the shop floor and block the machine up.

4. With the handlebar straight, determine which ski is most parallel to the chassis; then measure the distance between the center of both skis. Make sure the measurement is taken behind the front mount bracket and ahead of the rear spring mount bracket.

Fig. 9-17



0725-033

5. If an adjustment is needed, adjust the appropriate ski or both skis until measurement is the same at both front and back (the skis are parallel) or front measurement is 6 mm greater than back (1/4 in. "toe out").

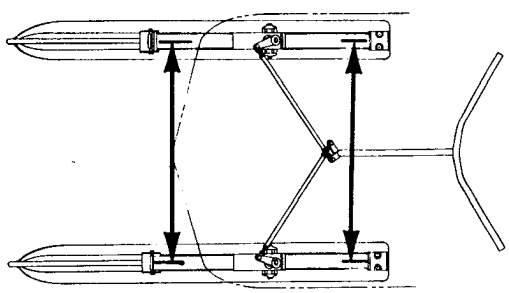
6. Bottom the jam nuts (one jam nut against the tie rod and the other against the tie rod end).

Lynx

1. Position the handlebar straight forward in relation to the machine.

2. With the handlebar straight, determine which ski is most parallel to the chassis; then measure the distance between the centers of both skis. Make sure the measurement is taken behind the front mounting bracket and ahead of the rear spring mount bracket.

Fig. 9-18



0725-463

3. If the measurements are different, an adjustment is needed.

4. Remove the cap screw and lock nut securing the tie rod end to the spindle arm; then loosen the jam nut securing the tie rod end.

5. Rotate the tie rod end inward or outward until the measurement is the same at both the front and back (the skis are parallel or the front measurement is 6 mm (1/4 in.) greater than the back (6 mm or 1/4 in. "toe out").

6. When the ski alignment is as specified in step 5, install the cap screw and lock nut which holds the spindle arm and the tie rod end. Tighten the lock nut to 2.9 - 3.6 kg-m or 21 - 26 ft-lb.

7. Lock the tie rod in place by tightening the jam nut against the tie rod.

Headlight Aiming

The headlight can be adjusted for vertical and horizontal aim of the high/low beam. The geometric center of the high beam light zone is to be used for vertical and horizontal surface aiming.

1. Make sure the suspension is properly adjusted.

2. Position the snowmobile on a level floor so that the headlight is approximately 8 meters or 25 feet away from a wall or similar aiming surface.

3. Measure the distance from the floor to the midpoint of the headlight.

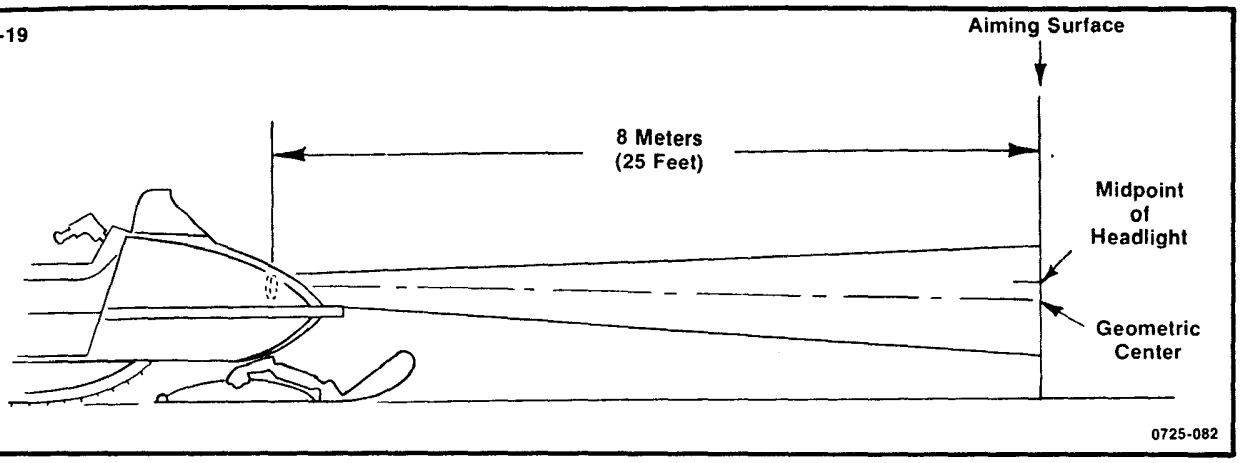
4. Using the measurement obtained in step 3, place a mark the same distance from the floor on a wall or similar aiming surface.

5. Start the engine and move the dimmer switch to high beam. DO NOT USE LOW BEAM — IMPROPER HEADLIGHT AIM WILL RESULT.

6. Observe the headlight beam aim. Beam is aimed properly when the most intense light is focused and centered 5 cm (2 in.) below the mark made on the wall or a similar aiming surface. If the headlight aim is not as specified, proceed to step 7.

7. If an adjustment is necessary, rotate the spring loaded screws until the most intense beam is centered according to step 6.

Fig. 9-19



Body Parts Replacement

The chassis adjustments were explained previously in this section. The remaining chassis parts may require replacement or repair of parts. This involves disassembly and assembly of many parts. Since the procedures are quite basic, complete instructions are not given. Refer to the parts manual for the correct assembly drawings.

SECTION 10 — ACCESSORIES

TABLE OF CONTENTS

1978 SNOWMOBILE ACCESSORY AVAILABILITY

	Pantera FA	Pantera FC	Panther 5000	Cheetah 5000	Panther 4000	Jag 3000	Jag 2000	Lynx T	Lynx S
Tachometer	0134-999	0136-091	0136-091	0136-091	0136-091	0136-091	0136-091	0134-999	0134-999
Speedometer	0134-953	0134-953	0134-953	0134-953	0134-953	0134-953	0134-953	0134-953	0134-953
Temperature Gauge	0134-955	0134-955	0134-955	0134-955	0134-955	0134-955	0134-955	N/A	N/A
Electric Start	N/A	0136-080	0136-089	0136-089	0136-089	0136-076	0136-076	N/A	N/A
Electric Handwarmer	0136-082	0136-082	0136-082	0136-082	0136-082	0136-082	0136-082	0136-082	0136-082
Arctic Cat Battery	0134-778	0134-778	0134-778	0134-778	0134-778	0134-778	0134-778	N/A	N/A
Hitch Kit	0136-034	0136-034	0136-037	0136-037	0136-037	0136-031	0136-031	0136-088	0136-088
Wheel Kit	N/A	0136-116	N/A	N/A	N/A	N/A	N/A	0136-090	0136-090
Safari Rak	0136-086	0136-086	0136-085	0136-085	0136-085	0136-084	0136-084	N/A	N/A
Safari Tote Bag	0136-087	0136-087	0136-087	0136-087	0136-087	0136-087	0136-087	N/A	N/A
Shock Absorber Kit	Std.	Std.	Std.	Std.	Std.	Std.	Std.	0134-874	0134-874
Handlebar Pad	Std.	Std.	Std.	Std.	Std.	Std.	Std.	0106-620	0106-620
Machine Cover	0134-950	0134-950	0134-948	0134-949	0134-948	0134-951	0134-951	0136-025	0136-025
High Altitude Kit	0136-044	0136-115	0136-106	0136-106	0136-107	0136-112	0136-113	0136-108	0136-109
Replacement Tool Kit	0155-660	0155-660	0155-660	0155-660	0155-660	0155-660	0155-660	0155-660	0155-660
Emergency Starter Strap	0144-121	0144-121	0144-121	0144-121	0144-121	0144-121	0144-121	0144-121	0144-121
Cat Cutter	0134-661	0134-661	0134-661	0134-661	0134-661	0134-661	0134-661	0134-661	0134-661
Arctic Cat 50:1 Spirit Synthetic Lubricant	0136-026	0136-026	0136-026	0136-026	0136-026	0136-026	0136-026	0136-026	0136-026
Chain Lube	0134-914	0134-914	0134-914	0134-914	0134-914	0134-914	0134-914	0134-914	0134-914
Engine Preservative	0134-478	0134-478	0134-478	0134-478	0134-478	0134-478	0134-478	0134-478	0134-478
Arctic Stud Kit Super Claw	0134-933	0134-933	0134-933	0134-933	0134-933	0134-933	0134-933	N/A	N/A
Arctic Stud Kit Arctic Claw	0134-859	0134-859	0134-859	0134-859	0134-859	0134-859	0134-859	N/A	N/A
Arctic Stud Kit 3-Point	0134-981	0134-981	0134-981	0134-981	0134-981	0134-981	0134-981	N/A	N/A
Carbides Skags	0134-957	0134-957	0134-957	0134-957	0134-957	0134-957	0134-957	N/A	N/A

Gauge Location Chart

1978 GAUGE LOCATION CHART

	Speedometer	Tachometer	Temperature Gauge
Lynx	Left	Right	N/A
Jag	Left	Right	Optional*
Panther, Cheetah	Center or Right	Right	Left
Pantera FA	Optional*	Optional*	Center or Left
Pantera FC	Right or Left	Right	Center or Left

*Gauge may be placed in any dash location

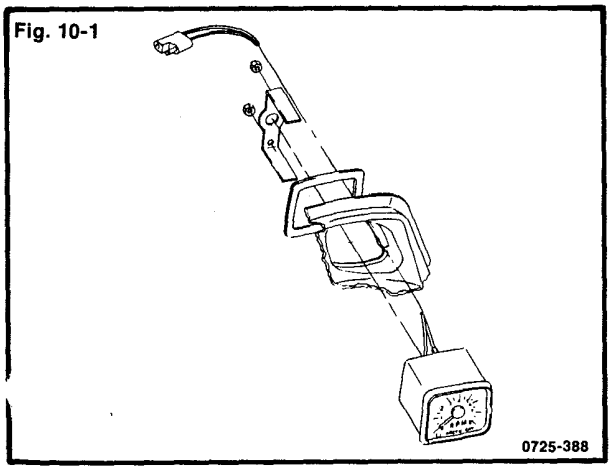
Tachometer Kit

Pantera FA, Lynx 0134-999

Equipment Necessary: 3/8-inch wrench

To install the electric tachometer, use the following procedure:

Fig. 10-1



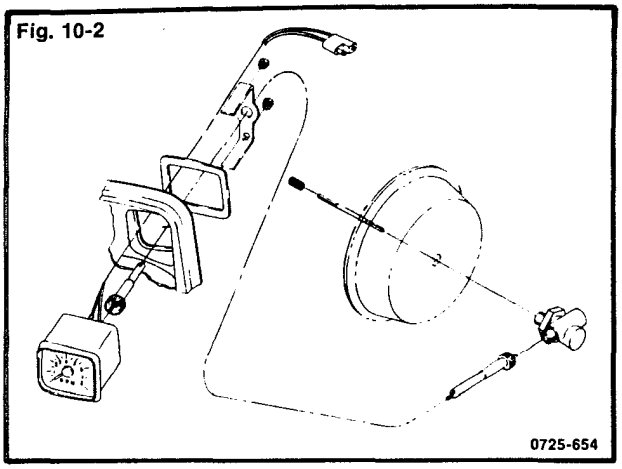
1. Remove the insert from the instrument panel; then place rubber cushion in position on the panel.
2. Slide the tachometer head into position.

NOTE: Make sure rubber cushion is correctly positioned.

3. Slide tachometer retaining ring onto back of tachometer.
4. Place tachometer bracket over mounting studs; then secure with two lock nuts.
5. Connect tachometer wire connector to the tachometer connector of main wiring harness.
6. Start the snowmobile engine and check for correct tachometer operation.

Pantera FC, Panther, Cheetah, Jag 0136-091

Fig. 10-2



NOTE: On 1978 Pantera FC models with serial numbers BEFORE 8009574, it will be necessary to remove the recoil housing and tap the drive bushing into position.

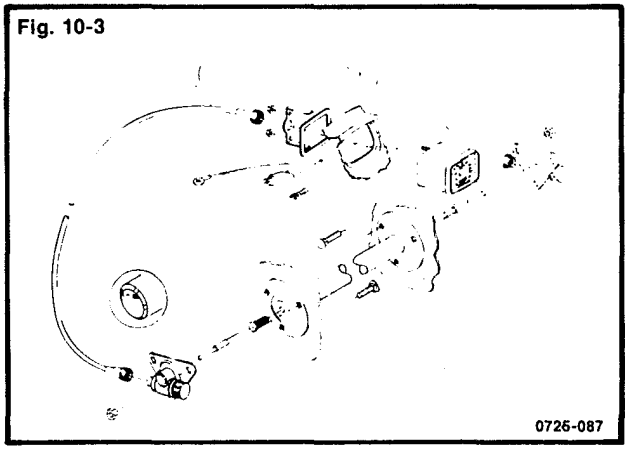
1. Remove the insert from MAG side hole in instrument panel.
2. Slide tachometer head into position.
3. Slide retaining ring onto back of tachometer.
4. Place tachometer bracket over mounting studs and secure in place with two lock washers and nuts.
5. Connect tachometer wire connector to tachometer connector of main wiring harness.
6. Remove the recoil from the engine; then remove the portion of the decal covering adapter hole in the MAG end of the crankshaft.
7. On Pantera FC models with serial numbers BEFORE 8009574, tap the drive bushing into the hole in the MAG end of the crankshaft. (On Pantera FC models with serial numbers AFTER 8009574, the drive bushing was installed at the factory).
8. Place the recoil in position and secure with mounting bolts.
9. Apply a liberal amount of grease to drive cable; then insert drive cable through adapter and into drive bushing.
10. Thread the drive adapter into the engine recoil and tighten jam nut so cable drive end is facing toward instrument panel.
11. Connect one end of tachometer cable to the drive adapter; then connect other end to tachometer head.
12. Start the engine and check for correct tachometer operation.

NOTE: The longer cable supplied in the kit is to be used on the Jag models only.

Speedometer Kit

Pantera, Panther, Cheetah, Jag, Lynx 0134-953

Fig. 10-3



Equipment Necessary: Pliers, hammer, 3/8-inch wrench and 1/2-inch socket

To install the speedometer kit, use the following procedure:

NOTE: To install the speedometer on the Lynx and Pantera FC, it will be necessary to use the cable conversion kit, p/n 0136-027.

1. Place the drive bushing in position and drive into the track drive shaft; then insert the short drive adapter cable.
2. Remove the three lock nuts securing bearing flange on the exposed end of the track drive shaft. DO NOT REMOVE BOLTS.
3. Check the setting of the drive adapter. The unit can be used for either RH or LH drive. To change setting, just remove cap and place on opposite side of drive adapter. Use the reference marks on the housings.
4. Connect one end of the speedometer cable to the drive unit.

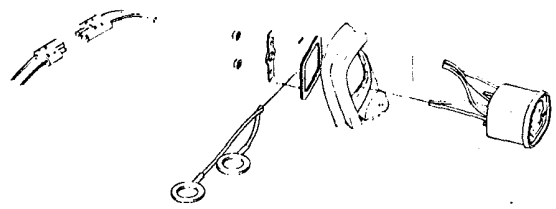
NOTE: On the Pantera models the conversion cable must be routed down the recoil side, over the tie rods and through the round cutout in the PTO front end side plate. Make sure rubber grommet is in position.

5. Remove the dash insert from the console; then slide the speedometer head into position.
6. Slide bracket over mounting studs; then secure in place with two lock nuts.
7. Connect the remaining end of speedometer cable to the speedometer head.
8. Plug the wire harness into the accessory terminal of the ignition harness.

Temperature Gauge Kit

Pantera, Panther, Cheetah, Jag 0134-955

Fig. 10-4



Equipment Necessary: 10 mm wrench, 13/16-inch socket

To install the temperature gauge, use the following procedure:

1. Remove the insert from the instrument panel.
2. Slide temperature gauge into position.
3. Slide temperature gauge retaining ring onto back of temperature gauge.
4. Place the temperature gauge bracket over mounting studs; secure in place with two lock washers and nuts.
5. Connect the temperature gauge light connector to the main wiring harness plug.
6. Remove the spark plugs. Place a drop of oil on each side of sender units. Place senders on spark plugs and install in cylinder heads.

NOTE: Left sender is for PTO side (No. 1) cylinder. Right sender is for MAG (No. 2) cylinder.

7. Start snowmobile and take a test ride to ensure correct gauge operation.

Electric Start Kit 0136-080

Equipment Necessary: Drill, 13/64-inch bit, 5/16-inch bit, 3/8-inch drive ratchet, 6-inch extension, 3-inch extension, 1/2-inch socket, 7/16-inch socket, 1/2-inch drive ratchet, 4-inch extension, 3/4-inch socket, 12 mm combination wrench, 8 mm combination wrench, 7/16-inch combination wrench, 1/2-inch combination wrench, No. 2 phillips screwdriver, regular screwdriver, pliers, ball peen hammer, flexible magnet, torque wrench, Arctic clutch puller, rivet gun.

Drive Clutch Removal

To remove the drive clutch, use the following procedure:

1. Open the hood, unlatch the clutch guard; then remove the drive belt.
2. Remove rubber cap plug from the PTO side of the belly pan.
3. Using 3/4-inch socket and extension, remove the drive clutch bolt from crankshaft.
4. Using an Arctic clutch puller, remove the drive clutch.

Install Kit Drive Clutch

To install the drive clutch, use the following procedure:

1. Install drive clutch with ring gear (part no. 0225-115) on crankshaft.
2. Secure drive clutch with drive clutch bolt and tighten to 8.30 kg-m or 60 ft-lb.
3. Install drive belt.
4. Secure clutch guard.

⚠ WARNING ⚠

Before operating snowmobile, be sure clutch guard is in position. Serious injury could result if contact is made with revolving parts.

5. Install cap plug in belly pan.

Install Starter Motor

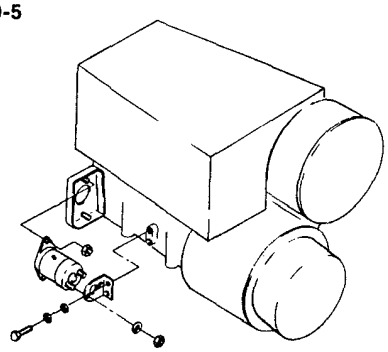
To install the starter motor, use the following procedure:

1. Loosen air silencer clamps; then disconnect mounting spring.
2. Slide silencer free of carburetor. Loosen carburetor clamp and remove carburetor.
3. Place the rear starter bracket in position on starter motor.
4. Secure the rear bracket with two (2) 5 mm lock washers and nuts. DO NOT TIGHTEN.

NOTE: When mounting the starter motor be sure starter terminal is positioned upward.

5. Move the starter motor into position on the engine snubber bracket; then tighten the two (2) lock nuts to 2.1 - 2.4 kg-m or 15 - 17 ft-lb.

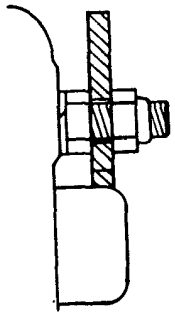
Fig. 10-5



0725-720

6. Secure rear bracket of starter motor to engine crankcase. Tighten to 0.7 - 1.0 kg-m or 5 - 7 ft-lb.

Fig. 10-6



0725-529

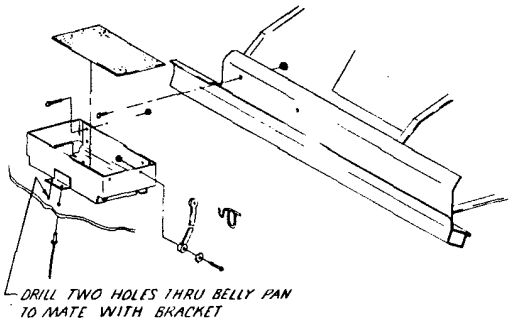
7. Tighten nuts securing rear bracket to starter motor to 0.28 - 0.55 kg-m or 2 - 4 ft-lb.

Install Battery Pan

To install the battery pan, use the following procedure:

1. Place the battery pan in position on the front end cross plate. Do not secure at this time.

Fig. 10-7

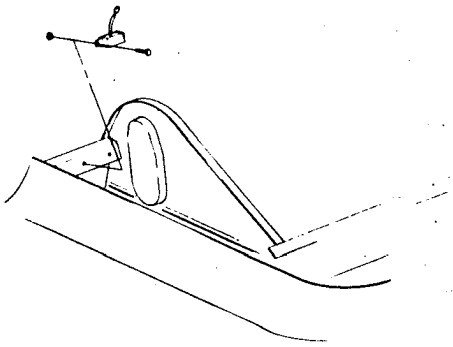


0725-526

2. Drill a 5/16-inch hole in belly pan in such a manner that the hole is positioned directly below the battery overflow hose.

NOTE: At this time using the regulator as a template, drill two (2) 5/16-inch holes in the footrest.

Fig. 10-8



0725-525

3. Secure the pan to the front end cross plate with four (4) 1/4-20 x 3/4 cap screws and lock nuts. Tighten to 0.8 kg-m or 6 ft-lb.

4. Drill two 13/64-inch holes in the belly pan using the front bracket of battery pan as a template.

5. Install two (2) rivets from the bottom side of the belly pan.

Electrical Component Installation

To install the electrical components, use the following procedure:

1. Secure new regulator/rectifier to the footrest using two (2) 1/4-20 x 3/4 screws and lock nuts. Bolt head must be positioned on the inside of footrest.

■ **NOTE: It is not necessary to remove existing regulator.**

2. Disconnect existing regulator; then connect new regulator/rectifier.

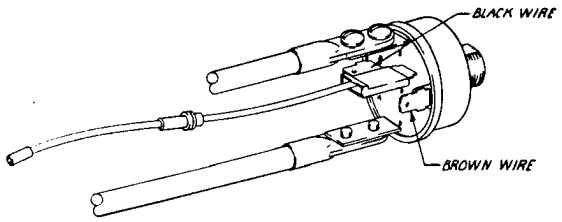
3. Remove the knurled nut securing ignition switch to the console.

4. Disconnect wires from existing switch.

5. Connect the fuse lead to the green single lead on the electric start switch. Wrap terminal with electrical tape to prevent any possible "shorting".

6. Connect the brown wire to the ground terminal on the switch.

Fig. 10-9



0725-673

7. Connect the black wire to the remaining M terminal.

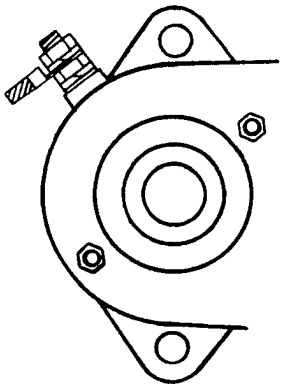
8. Move switch into position in console; then secure with knurled nut.

● CAUTION ●

To prevent damaging the electrical system of the snowmobile, check to be sure the starter motor is wired properly. See Fig. 10-14 Wiring Diagram.

9. Secure red cable to the starter motor terminal.

Fig. 10-10



0725-185

10. Slide air silencer into position. Install carburetor.

11. Install carburetor clamp; then tighten air silencer clamps. Install air silencer spring.

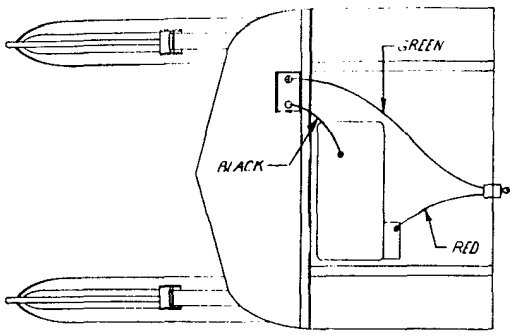
12. Install battery and secure with straps.

13. Place overflow hose in hole previously drilled in belly pan. Cut excess hose to 1-inch below belly pan.

14. Connect the green cable using the carriage bolt to the positive (+) terminal of the battery and tighten.

15. Secure black cable to cylinder support bracket. With the ignition switch in the off position, connect the remaining end to the negative (-) terminal on the battery.

Fig. 10-11



0725-722

● CAUTION ●

The voltage regulator will be damaged if battery connections are reversed.

16. Secure all loose wiring with wiring ties. Make sure wires and cables do not contact any rotating, moving or hot engine parts.

17. Test start engine. If the starter does not operate correctly, see the troubleshooting procedure.

Charging A Dry Battery

To charge a dry battery, use the following procedure:

● CAUTION ●

Before activating battery, check to be sure the battery vent tube is free of obstructions. If an obstruction is found, the tube should be pulled free of the battery and then cut off below the obstruction. Use a light coat of RTV around the tube when installing on the battery.

1. Fill the battery with electrolyte to 6 - 12 mm or 1/4-inch to 1/2-inch above the separators.

2. Allow battery to stand for 15 minutes at room temperature before charging.

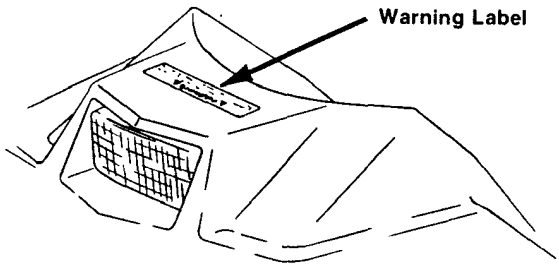
3. Charge 6 volts at 30 amps for 10 minutes and 12 volts at 15 amps for 10 minutes.

4. After charging, be sure that electrolyte is still 6 - 12 mm or 1/4 to 1/2-inch above separators.

⚠ WARNING ⚠

This snowmobile is equipped with electric start. Before turning sled on its side for inspection, maintenance or repair, the battery must be removed to prevent battery acid spillage.

Fig. 10-12



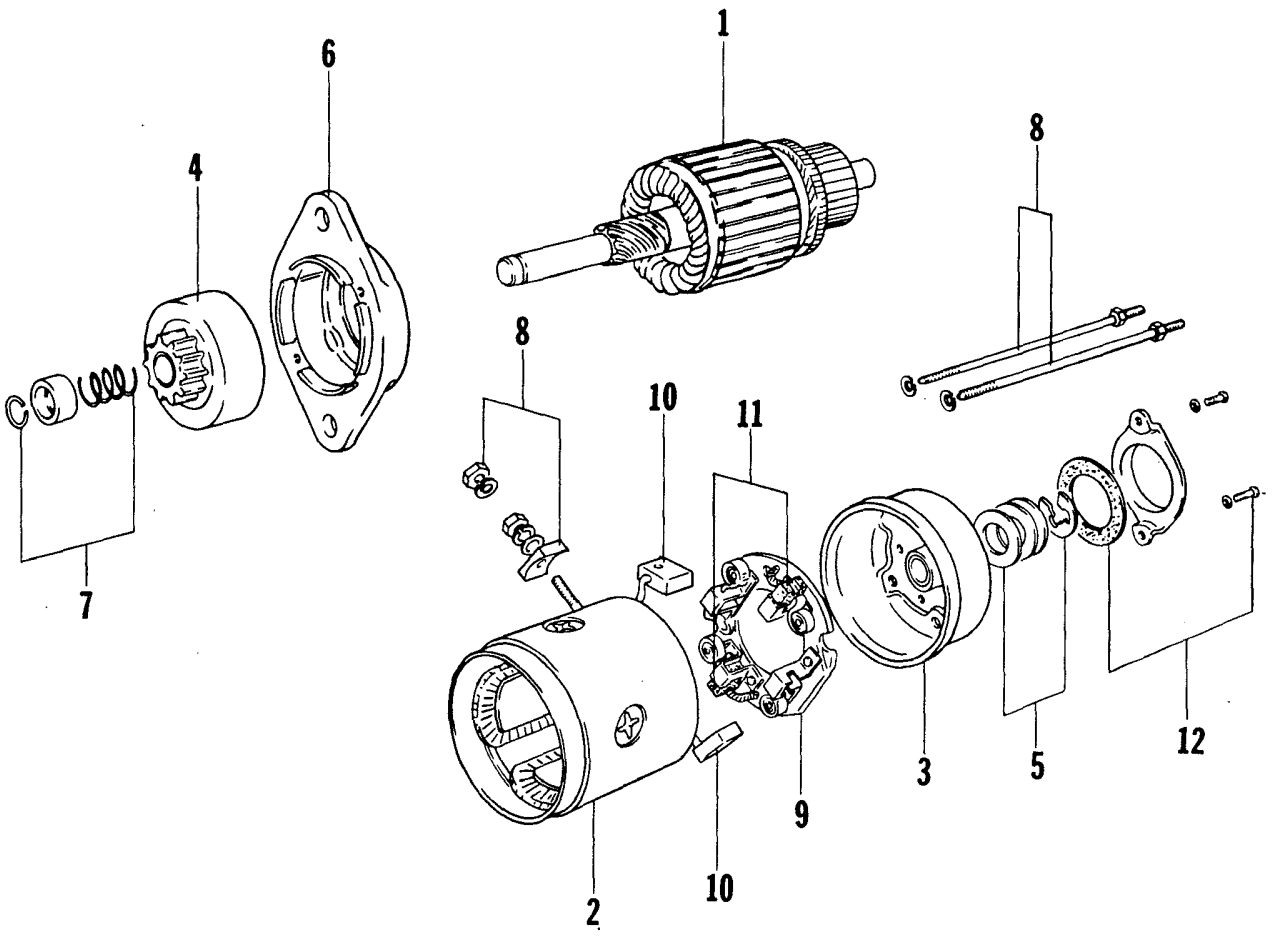
0725-730

TROUBLESHOOTING PROCEDURE

Problem	Probable Cause	Remedy
Hot or smoking wires	System wired incorrectly	Check wiring against wiring diagram
Starter does not turn over	Discharged battery	Check
	Loose connection	Check tightness of all connections
	Improper grounding	Check ground connections

STARTER MOTOR PARTS

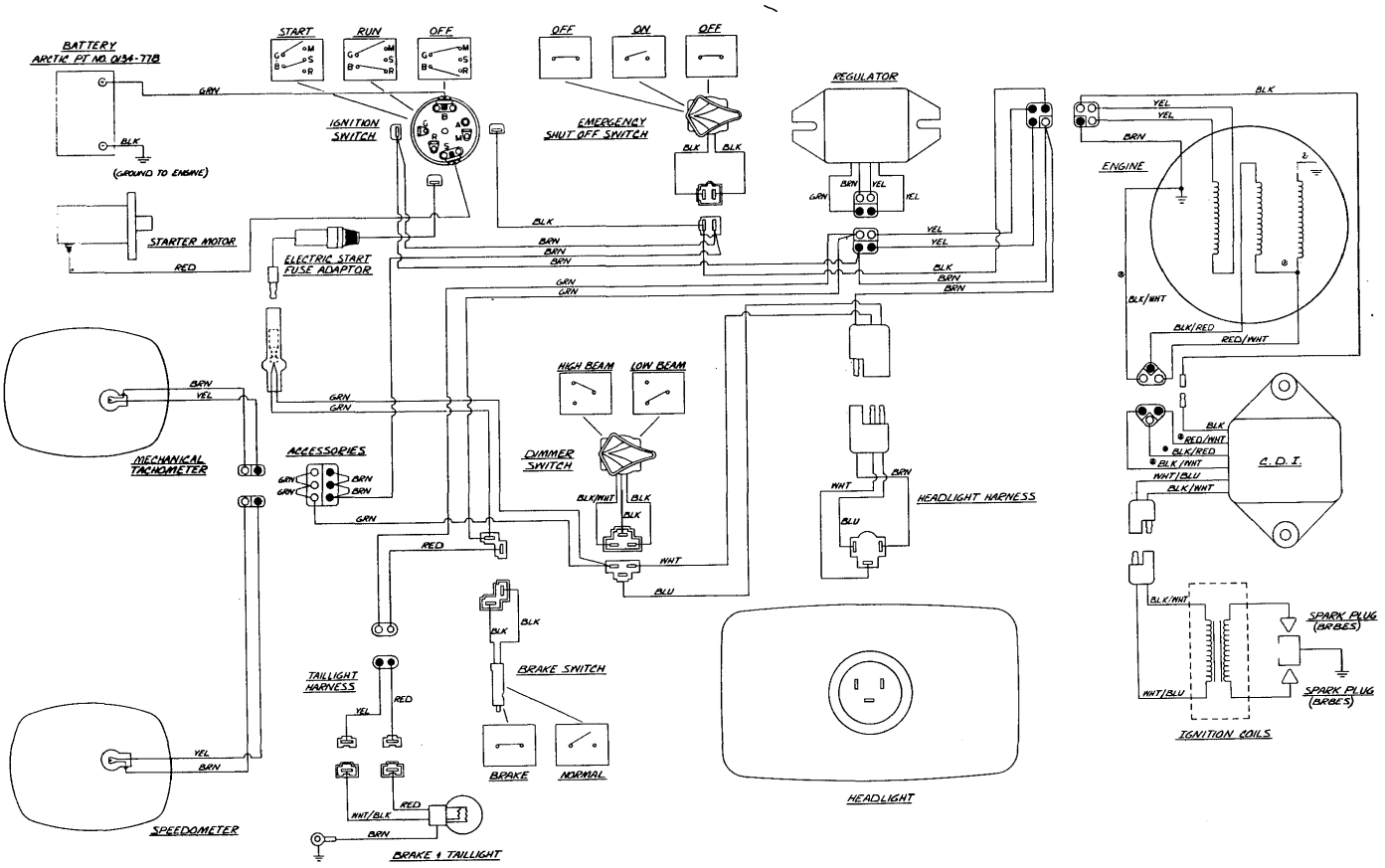
Fig. 10-13



KEY

Ref. No.	Qty.	Description
1	1	Armature
2	1	Yoke
3	1	Rear Cover
4	1	Pinion
5	1	Washer Kit
6	1	Front Cover
7	1	Pinion Stopper
8	1	Bolt Kit
9	1	Brush Holder
10	1	Brush Set (+)
11	1	Brush Set (-)
12	1	Dust Cover

0725-686



WIRING SCHEMATIC OF 1978 PANTERA ALL ACCESSORIES

Fig. 10-14

Electric Start Kit
0136-089

Panther, Cheetah

Equipment Necessary: 1/2-inch socket, 7/16-inch socket, 12 mm socket, 10 mm socket, 6-inch extension, 6 mm hex key wrench, 8 mm wrench, 10 mm wrench, 12 mm wrench, No. 3 phillips screwdriver, regular screwdriver, vise grip, electrical tape, drill, 5/16-inch bit, torque wrench, magnet.

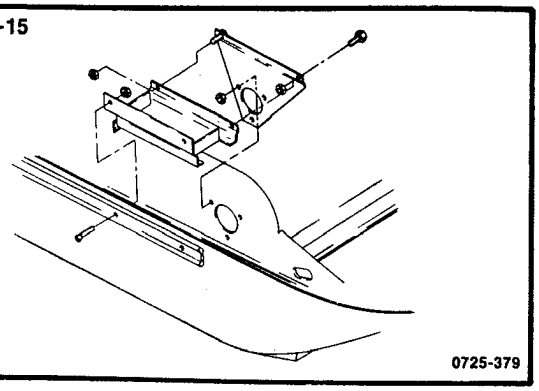
Battery Pan Installation

To install the battery pan, use the following procedure:

1. Loosen the three lock nuts securing MAG side drive shaft bearing in place. By loosening nuts, the track tension will put a slight bind on the bolts preventing them from falling out of place. Remove lock nuts completely.
2. Guide the battery support bracket over the three carriage bolts. Place one (1) 1/4-20 x 5/8 cap screw through rear hole of battery support bracket; then install lock nuts and tighten to 2.8 kg-m or 20 ft-lb.
3. Remove the lock nuts from the two bumper bolts; they will be used to secure the battery holder.
4. Place the battery pan in position. Using a drill and 5/16-inch bit, drill one hole in bottom of belly pan for battery overflow hose.
5. Using two (2) 1/4-20 x 5/8 cap screws, secure battery pan to support bracket.
6. Using two (2) bumper bolts and lock nuts, secure battery holder to belly pan.

NOTE: Before securing battery pan to belly pan, be sure the hood channel is in position.

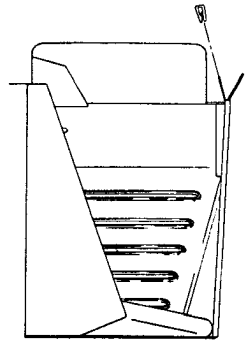
Fig. 10-15



0725-379

7. Place the reflectorized tape over the present bumper strip.
8. Place the vinyl strip over the edge of the hood channel.

Fig. 10-16



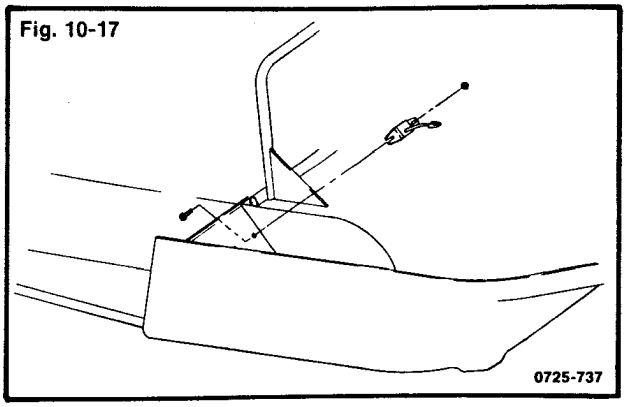
0725-736

Electrical Component Installation

To install the electrical components, use the following procedure:

1. Remove the existing voltage regulator from the right footrest.
2. Using the regulator/rectifier provided in the kit as a template, drill one (1) additional 5/16-inch hole.
3. Place the regulator/rectifier in position and secure with two (2) 1/4-20 x 7/8 cap screws and lock nuts.

Fig. 10-17



0725-737

4. Connect the regulator/rectifier to the main wiring harness.

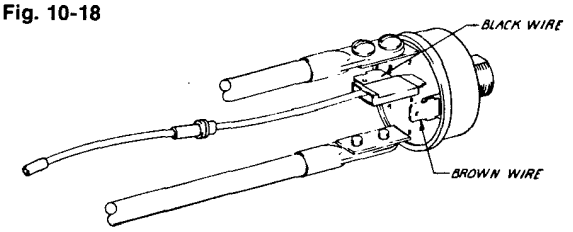
5. Remove the knurled nut securing ignition switch to the console; then push switch through the console. Disconnect the switch from the wiring harness.

6. Connect the fuse lead to the green single lead on the electric start switch. Wrap terminal with electrical tape to prevent any possible "shorting".

7. Connect the brown wire to the ground terminal on the switch.

8. Connect the black wire to the remaining M terminal.

Fig. 10-18



0725-673

9. Move the switch into position in the console and secure with knurled nut.

CAUTION

To prevent damaging the electrical system of the snowmobile, check to be sure the starter motor is wired properly. See Fig. 10-25 Wiring Diagram.

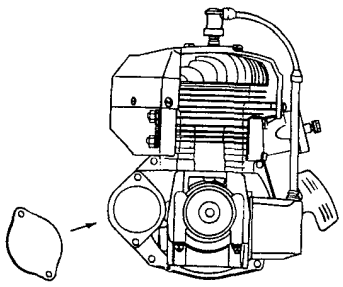
Starter Motor Installation

To install the starter motor, use the following procedure:

1. Remove the exhaust manifold and muffler from the snowmobile.

2. Remove cover plate from the starter motor mount on the flywheel housing.

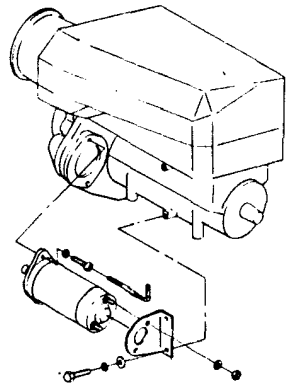
Fig. 10-19



0725-181

3. Remove the two (2) starter flange studs.

Fig. 10-20



0725-735

4. Install the support bracket on the starter motor using the 5 mm lock washers and nuts provided in the kit. DO NOT TIGHTEN.

5. Place starter motor in position. Using a 4-3/4 inch hex key wrench, lock washers (from cover plate removal) and 8 mm socket head bolts (from the kit), secure the starter motor to the crankcase. Tighten to 1.8 - 2.2 kg-m or 13 - 16 ft-lb.

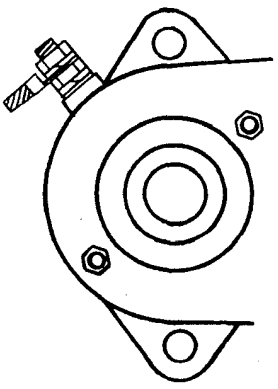
NOTE: When mounting the starter motor, be sure starter terminal is positioned upward.

6. Fasten the support bracket to the crankcase using the 6 mm bolts, lock washers and flat washers supplied in the kit. Tighten the bolts to 0.7 - 1.0 kg-m or 5 - 7 ft-lb.

7. Secure support bracket at starter motor to engine crankcase. Tighten to 0.7 - 1.0 kg-m or 5 - 7 ft-lb.

8. Connect the red cable (ignition switch to starter) to the terminal on the starter motor.

Fig. 10-21



0725-185

9. Install the exhaust manifold and muffler.

Battery Cable Connection

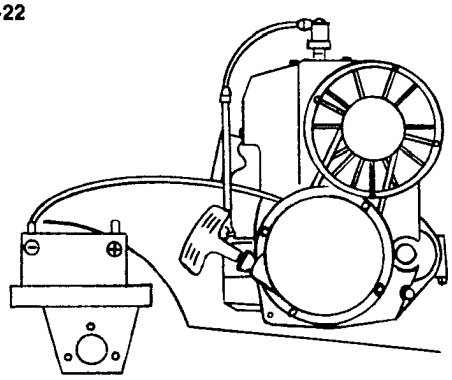
To connect the battery cables, use the following procedure:

Place the battery in position and secure with straps.

NOTE: Before securing the battery, check to be sure that there is at least 3 mm or 1/8-inch clearance between the battery and the bumper bolts. If clearance is less than 3 mm or 1/8-inch, it will be necessary to file the bolts.

2. Connect one end of the black cable to one of the fan housing mounting bolts on the engine.

Fig. 10-22



0725-462

3. Route the vent hose through hole previously drilled in belly pan. Cut excess hose to 2.5 cm or 1 inch below belly pan.

4. Using the two (2) 1/4-20 x 3/4 carriage bolts and lock nuts, secure the green cable from the switch to the positive (+) terminal on the battery; then connect the black cable to the negative (-) ground terminal on the battery.

CAUTION

The voltage regulator will be damaged if battery connections are reversed.

5. Use the cable ties to route all wiring away from any hot or rotating components.

Charging a Dry Battery

To charge a dry battery, use the following procedure:

CAUTION

Before activating battery, check to be sure the battery vent tube is free of obstructions. If an obstruction is found, the tube should be pulled free of the battery and then cut off below the obstruction. Use a light coat of RTV around the tube when installing on the battery.

1. Fill the battery with electrolyte 6 - 12 mm or 1/4-inch to 1/2-inch above the separators.

2. Allow battery to stand for 15 minutes at room temperature before charging.

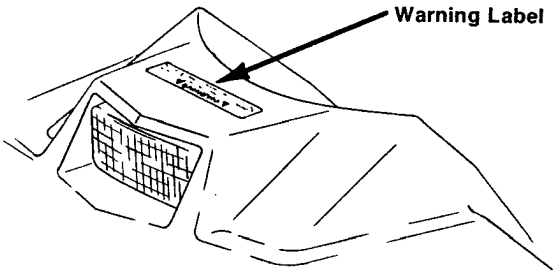
3. Charge 6 volts at 30 amps for 10 minutes and 12 volts at 15 amps for 10 minutes.

4. After charging, be sure that electrolyte is still 6 - 12 mm or 1/4 to 1/2-inch above separators.

WARNING

This snowmobile is equipped with electric start. Before turning sled on its side for inspection, maintenance or repair, the battery must be removed to prevent battery acid spillage.

Fig. 10-23



0725-730

5. Test start engine. If the starter does not operate correctly, see the troubleshooting chart.

! WARNING !

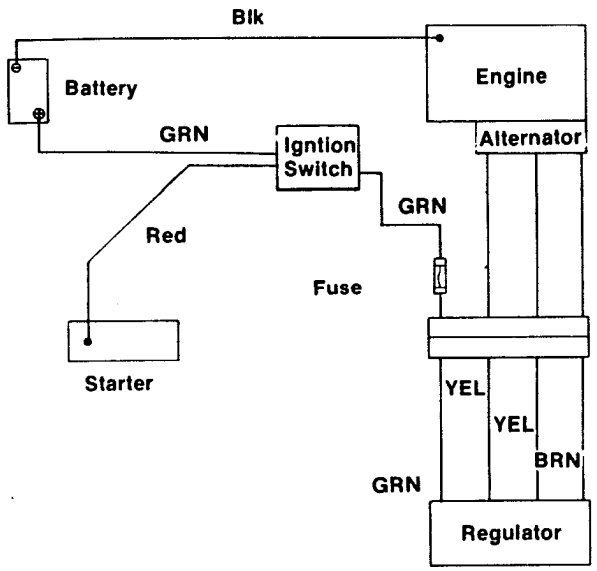
1. Always disconnect battery cables from the battery when working on any electrical components.
2. To prevent the chance of accidental starter engagement or starting of the engine, always remove the key from the ignition switch.
3. Battery electrolyte is a strong acid solution and must be handled with extreme caution. If the battery solution should come in contact with any part of the body, immediately flush the exposed area with a liberal amount of water and obtain medical aid as soon as possible.
4. Make sure the battery connections are tight. Loose connections can cause electrical component damage or failure.

TROUBLESHOOTING PROCEDURE

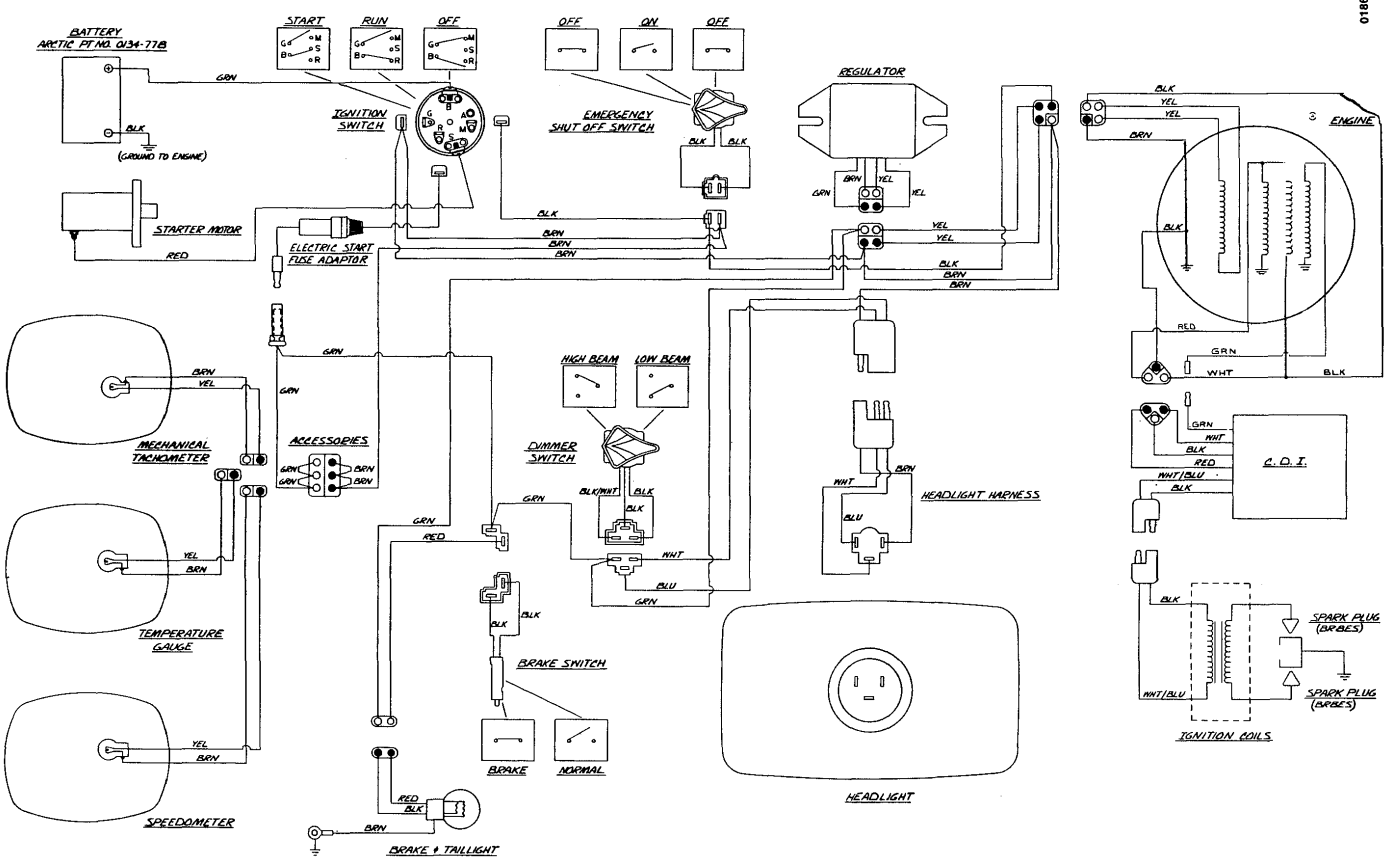
Problem	Probable Cause	Remedy
Hot or smoking wires	System wired incorrectly	Check wiring against wiring diagram
Starter does not turn over	Discharged battery	Check
	Loose connection	Check tightness of all connections
	Improper grounding	Check ground connections

WIRING DIAGRAM

Fig. 10-24



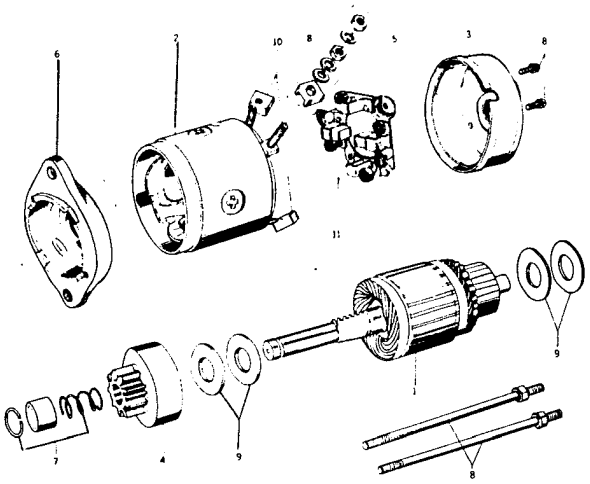
0186-082



WIRING SCHEMATIC OF 1978 PANTHER/CHEETAH ALL ACESSORIES
Fig. 10-25

Fig. 10-26

STARTER MOTOR PARTS LIST
PART NO. 0145-073



KEY

Ref. No.	Part No.	Qty.	Description
1	0145-062	1	Armature
2	0145-063	1	Yoke
3	0145-064	1	Rear Cover
4	0145-065	1	Pinion
5	0145-066	1	Brush Holder
6	0145-067	1	Front Cover
7	0145-068	1	Pinion Stopper
8	0145-069	1	Bolt Kit
9	0145-070	1	Washer Kit
10	0145-071	1	Brush Set (+)
11	0145-072	1	Brush Set (-)

0725-187

Electric Start Kit
0136-076

Jag

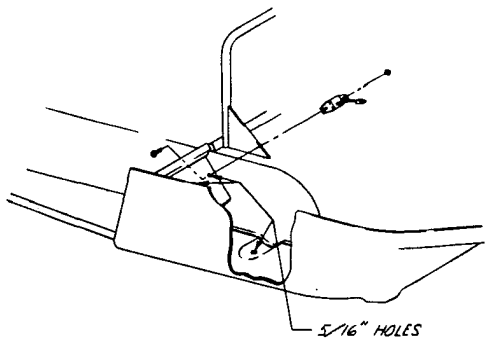
Equipment Necessary: Drill, 5/16-inch bit, 7/16-inch socket, 1/2-inch socket, 3/4-inch socket, 9/16-inch socket, No. 2 phillips screwdriver, regular screwdriver, pliers, 7/16-inch combination wrench, 1/2-inch combination wrench, 9/16-inch combination wrench, 10 mm combination wrench, 8-inch extension, 4-inch extension, Arctic clutch puller bolt, large channel lock pliers, pocket knife.

Regulator-Toolbox Installation

To install the regulator and toolbox, use the following procedure:

1. Remove existing toolbox.
2. Using a drill and 5/16-inch bit, drill two holes in the top of the right footrest. Using a 7/16-inch combination wrench, attach the regulator to the footrest using two (2) 1/4-20 x 3/4 cap screws and lock nuts.
3. Disconnect existing regulator wiring system and connect new regulator. It is not necessary to remove the existing regulator.
4. Drill one (1) 5/16-inch hole in the bottom of the belly pan in the chain case relief. This hole will be used later for the battery overflow hose.

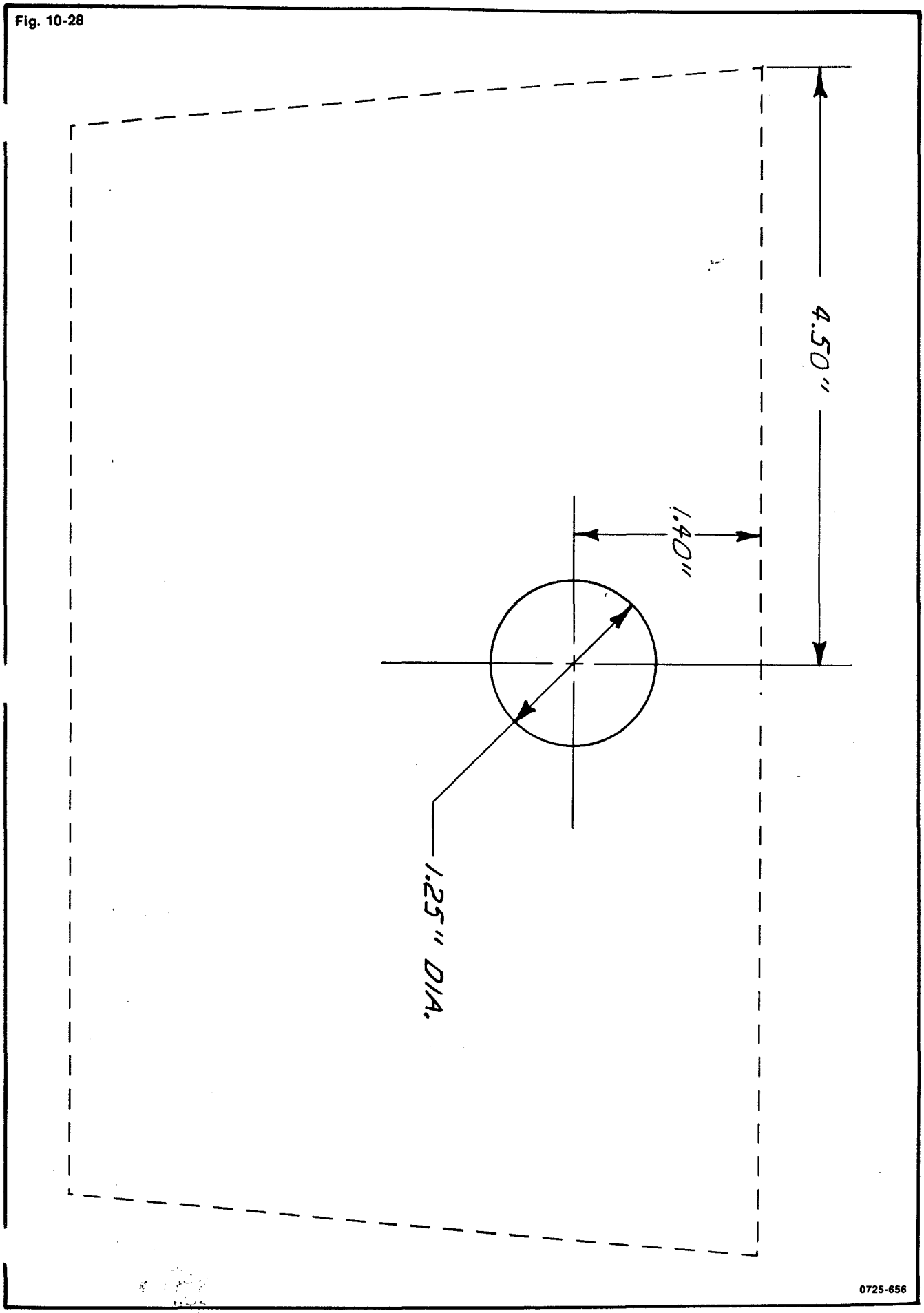
Fig. 10-27



0725-672

5. Using a pocket knife, cut a hole (1-1/8 inch diameter) 4-1/8 inch from the back edge and 1-1/8 inch from the top of the toolbox so that the chain case oil plug is accessible. Insert existing bumper bolts (1/4-20 x 1-1/8) into pre-drilled holes and tighten.

Fig. 10-28



Battery Bracket-Support Bracket Installation

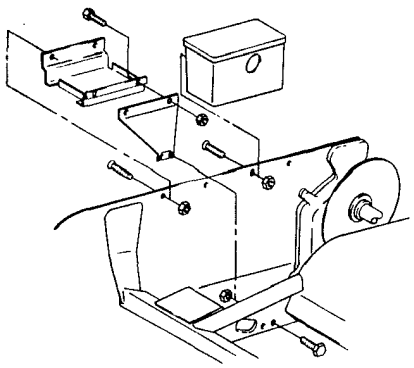
To install the battery bracket and the support bracket, use the following procedure:

1. Remove hood cable. Install and secure battery support bracket in pre-drilled holes in front side panel. The narrower end of the bracket is placed in a downward position. Use 1/4-20 x 3/4 bolts and lock nuts.

2. Install the battery holder with the larger side of the bracket next to the outside edge of the belly pan. Replace hood cable.

3. Align the battery holder and the support bracket. Insert two (2) bolts and lock nuts; then tighten.

Fig. 10-29



0725-657

Drive Clutch Removal

To remove the drive clutch, use the following procedure:

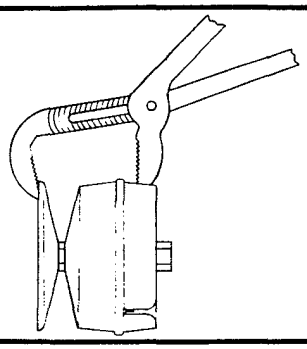
1. Remove the plug in the belly pan.

2. Using a 3/4-inch socket, remove the bolt securing the drive clutch.

3. Using an Arctic clutch puller, loosen the clutch on the crankshaft.

4. Using a large channel lock pliers, compress and remove the clutch from the engine compartment.

Fig. 10-30



0725-659

Intake Manifold Positioning - 2000 Jag Only

On the 2000 Jag, it will be necessary to change the manifold positioning to ensure adequate clearance for the electric start motor. Because the manifold is manufactured with a slight flange angle, the manifold can be rotated 180° to obtain sufficent clearance.

Use the following procedure to remove the intake manifold:

1. Loosen the clamp securing the carburetor to the intake manifold. Remove the carburetor.

2. Remove the 4 nuts and washers securing the intake manifold to the engine.

3. Remove the intake manifold.

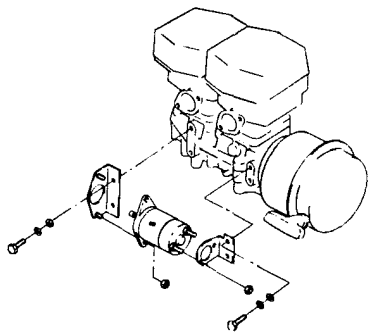
Starter Motor Installation

To install the starter motor, use the following procedure:

1. Attach front bracket to block using two (2) 1/4-20 x 3/4 cap screws and lock washers.

2. Attach rear bracket to the starter motor using two (2) 5 mm nuts and lock washers. DO NOT tighten at this time.

Fig. 10-31



0725-658

3. Mount the starter motor on mounting studs of the starter bracket using two (2) 5/16-inch lock nuts. Tighten the two rear bracket lock nuts in sequence to 0.7 kg-m or 5 ft-lb.

4. Secure rear bracket to block using two (2) 1/4-20 x 3/4 cap screws and lock washers.

Intake Manifold Positioning - 2000 Jag Only

Use the following procedure to install the intake manifold:

1. Before installing the intake manifold, check to be sure the gaskets are in good condition.

If they are damaged, replace the gaskets. Apply a light coat of RTV sealer to both sides of the gasket.

2. Turn the intake manifold so it slants upward.

   Install the manifold and gasket on the stud bolt and secure with washers and nuts. Tighten the nuts to 1.8 - 2.2 kg-m or 13 - 16 ft-lb.

4. Install the carburetor and secure the clamp.

Ignition Switch Installation

To install the ignition switch, use the following procedure:

1. Remove the cable tie securing main wiring harness to frame cross member.

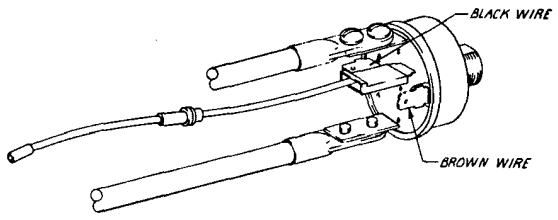
2. Remove the knurled nut securing the ignition switch in the console, then push the switch through the console. Disconnect the switch from the harness.

3. On ignition switch provided in the kit connect the brown wire to the ground terminal. Connect the black wire to the M terminal. Plug the fuse holder wire into the green wire open lead in the electrical harness.

4. Move new ignition switch into position in the console. Secure with knurled nut.

5. Connect the red cable to the terminal on the starter motor.

Fig. 10-32



0725-673

● CAUTION ●

To prevent damaging the electrical system of the snowmobile, check to be sure the starter motor is wired properly. See Fig. 10-39 for Wiring Diagram.

Ring Gear Guard

To install the ring gear guard, use the following procedure:

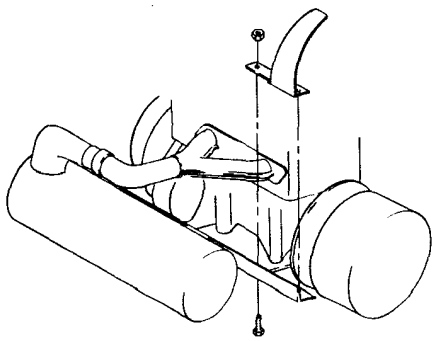
1. Move to the PTO side of engine. Remove the nut securing engine plate bolt.

2. Remove lock nut securing left front rubber support mount.

3. Align ring gear guard with bolts.

4. Install nuts and secure ring gear guard.

Fig. 10-33



0725-663

Drive Clutch Conversion - 2000 Jag Only

On the 2000 Jag it will be necessary to modify the drive clutch provided in the kit with the weights, ramps and rollers from the existing clutch. The weights, ramps and rollers in the clutch from the kit should be installed in the existing clutch and then returned to your Arctic Cat dealer.

The following instructions should be followed for both clutches:

1. Remove the three hex key head cap screws holding the outer housing to the moveable shaft; then carefully remove the outer housing.

■ NOTE: When removing cap screws be sure to apply downward pressure on the outer cover. When all cap screws have been removed, slowly release the cover making sure that the duralon bushing is not damaged.

2. Remove the clutch spring.

3. Remove the lock nut and cap screw holding the weights, roller and bushing to the roller arm. Note the position of the head of the cap screw.

4. Perform step 3 on the remaining roller arm.

5. Loosen the cap screws securing the three ramps; then remove the ramps.

6. Install the weights, rollers and bushings into the drive clutch provided in the kit using lock nuts and cap screws.

7. Install the weights, rollers and bushings from the clutch in the kit into the existing drive clutch.

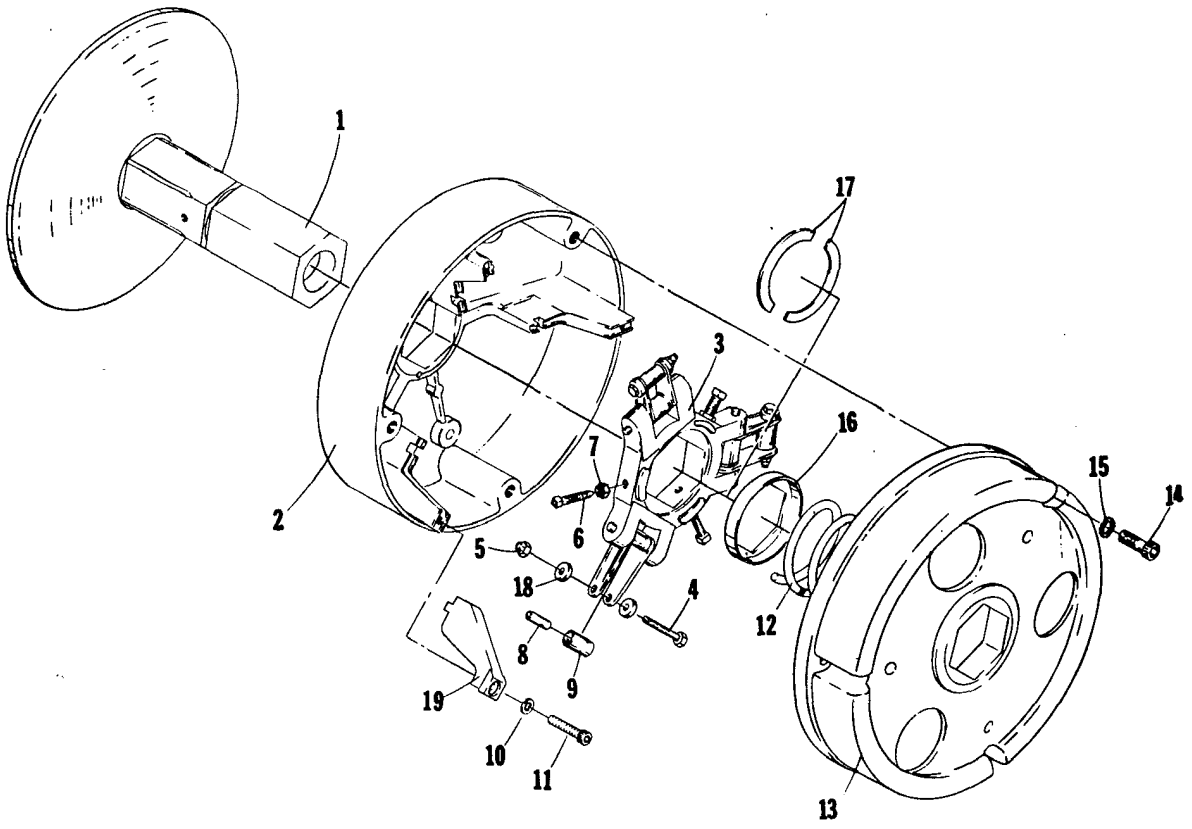
NOTE: Head of cap screw must be positioned on side of roller arm having the two small "ears".

8. Secure the ramps to the drive clutch using lock washers and cap screws and tighten to 0.3 - 0.4 kg-m or 25 - 30 in.-lb.

9. Slide the spring onto the hex shaft.

10. Place the cover housing on the shaft. Carefully push down on the cover housing and lift up on the moveable sheave until the parts contact; then install the three hex head cap screws. Be sure to use care when installing the cover so the duralon bushing is not damaged. Tighten the cap screws to 2.1 - 2.4 kg-m or 15 - 17 ft-lb.

Fig. 10-34



0700-009

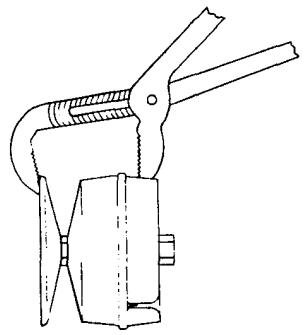
Ref. No.	Part No.	Qty.	Description	Ref. No.	Part No.	Qty.	Description
1	0146-304	1	Sheave, Stationary	11	8005-341	3	Screw, Cap
2	0146-204	1	Sheave, Moveable	12	0146-068	1	Spring
3	0146-297	1	Spider Assy (Incl. 4-9)	13	0146-201	1	Housing
4	0146-146	3	Pin	14	8005-611	3	Screw, Cap
5	0123-430	3	Nut, Lock	15	8053-242	3	Washer, External Lock
6	0123-622	3	Screw, Set	16	0146-267	1	Washer, Cup
7	8042-246	3	Nut	17	0146-212	2	Ring, Split
8	0146-194	3	Bushing	18	0146-104	6	Weight
9	0146-355	3	Roller Assembly	19	0146-294	3	Ramp
10	8051-123	3	Washer, Lock				

Drive Clutch Installation

To install the drive clutch, use the following procedure:

Using a large channel pliers, compress the drive clutch with ring gear and place on crankshaft.

Fig. 10-35



0725-659

CAUTION

Before securing drive clutch, check to be sure that clutch arm assemblies are not binding with the clutch spring. Arm must pivot freely on spider pins.

Secure drive clutch with drive clutch bolt. Tighten bolt to 7.6 - 8.3 kg-m or 55 - 60 ft-lb.

3. Install drive belt. Replace plug in belly pan. Lower clutch guard and secure with pin.

WARNING

DO NOT operate the snowmobile without clutch guard in place. Serious injury could result if contact is made with revolving parts.

Charging a Dry Battery

To charge a dry battery, use the following procedure:

CAUTION

Before activating battery, check to be sure the battery vent tube is free from obstructions. If an obstruction is evident, the tube should be pulled free of the battery and then cut off below the obstruction. Use a light coat of RTV around the tube when reinstalling on the battery.

1. Fill the battery with electrolyte to 6 - 12 mm or 1/4-inch to 1/2-inch above the separators.

2. Allow battery to stand for 15 minutes at room temperature before charging.

3. Charge 6 volts at 30 amps for 10 minutes and 12 volts at 15 amps for 10 minutes.

4. After charging be sure that electrolyte is still 6 - 12 mm or 1/4 to 1/2-inch above separators.

Electrical Component Installation

To install the electrical components, use the following procedure:

1. Remove screw from recoil starter. Align end of negative (black) battery cable with hole; then insert screw and tighten.

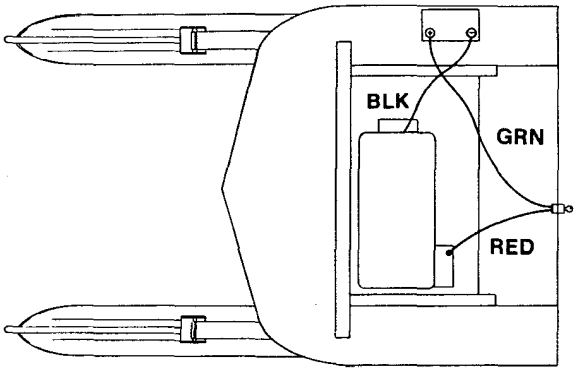
2. Place battery in holder.

3. Connect negative cable (black) to negative post (-) on battery using one (1) carriage bolt, flat washer and lock nut.

CAUTION

The voltage regulator will be damaged if battery connections are reversed.

Fig. 10-36



0725-660

4. Connect positive cable (green) to positive post (+) on battery using one (1) carriage bolt, flat washer and lock nut.

5. Place overflow hose in hole previously drilled in belly pan relief.

6. Secure battery with tie down straps.

7. Plastic cable ties are provided in the kit to secure any loose wires or cables. Make sure wires and cables do not contact any rotating, moving or hot engine parts.

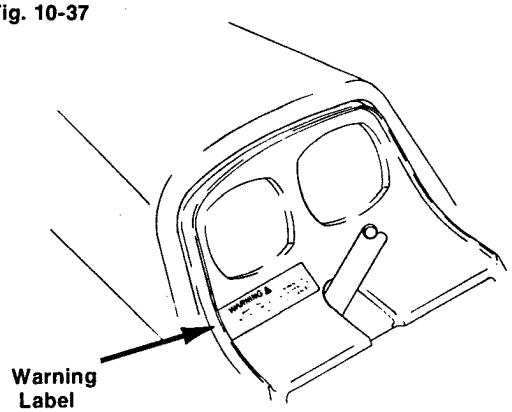
8. Test start engine. If the starter does not operate correctly, see the troubleshooting procedure below.

9. Place the reflectorized tape over the present bumper strip.

⚠ WARNING ⚠

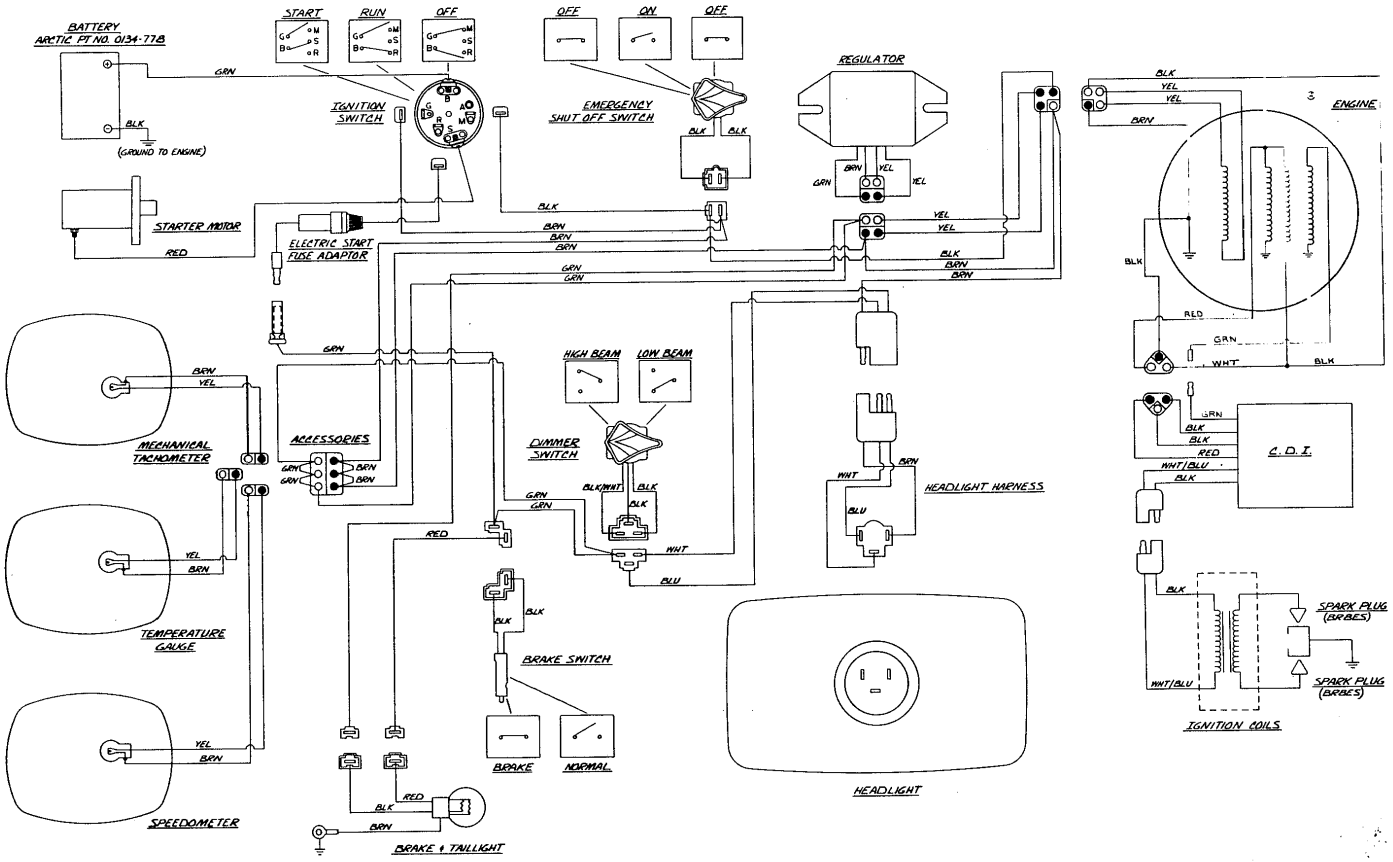
This snowmobile is equipped with electric start. Before turning sled on its side for inspection, maintenance or repair, the battery must be removed to prevent battery acid spillage.

Fig. 10-37



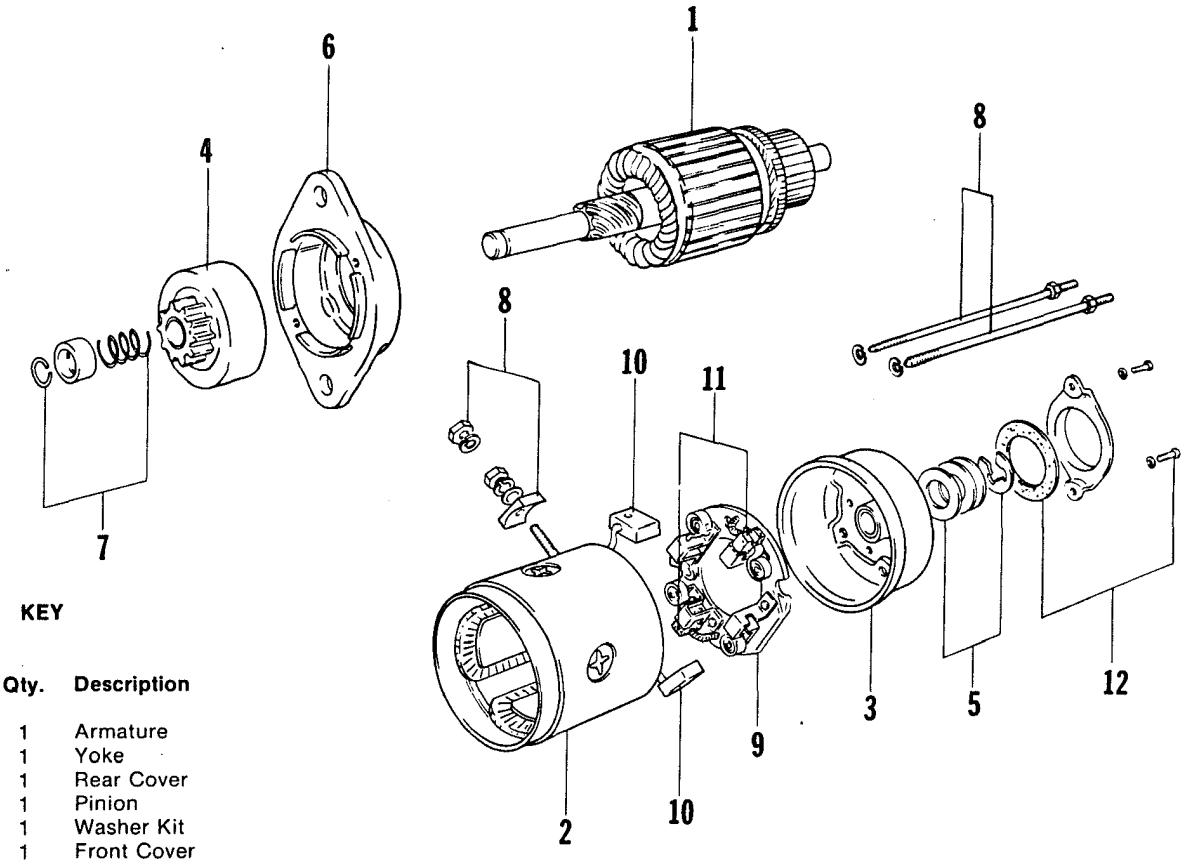
TROUBLESHOOTING PROCEDURE

Problem	Probable Cause	Remedy
Hot or smoking wires	System wired incorrectly	Check wiring against wiring diagram
Starter does not turn over	Discharged battery	Check
	Loose connection	Check tightness of all connections
	Improper grounding	Check ground connections



WIRING DIAGRAM OF 1978 JAG
ALL ACCESSORIES
Fig. 10-38

Fig. 10-39



KEY

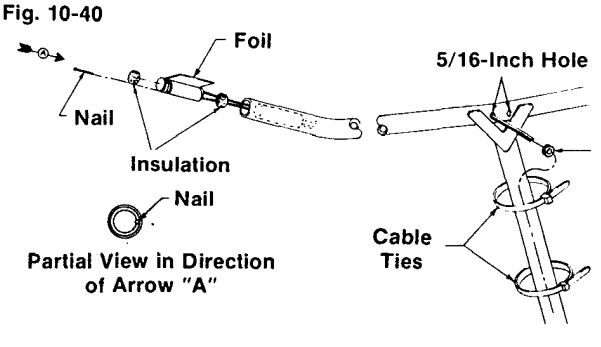
Ref. No.	Qty.	Description
1	1	Armature
2	1	Yoke
3	1	Rear Cover
4	1	Pinion
5	1	Washer Kit
6	1	Front Cover
7	1	Pinion Stopper
8	1	Bolt Kit
9	1	Brush Holder
10	1	Brush Set (+)
11	1	Brush Set (-)
12	1	Dust Cover

STARTER MOTOR PARTS

0725-686

Electric Handlebar Warmer Kit

Fig. 10-40



0725-623

Pantera, Panther, Cheetah, Jag, Lynx 0136-082

To install the handlebar warmer components, use the following procedure:

1. Remove the existing handle grips. On most models, remove the three screws securing the handle grip to the cap; then remove the spring pin securing grip to the handlebar.

2. Drill two 5/16-inch holes one (1) inch apart on the front portion of the handlebar.

3. Using a piece of mechanics wire, thread the wire through one of the holes until the wire protrudes through the end of the handlebar.

4. Use the wire to pull the heating element leads into the handlebar.

5. Begin pulling the element into the handlebar. Place a small piece of insulation in the end of the handlebar in front of the element.

6. Wrap the element with foil to provide a snug fit.

7. Carefully pull the element into the handlebar. Be careful not to pull the leads loose. Use a blunt dowel to guide the element about 12 mm or 1/2-inch into the handlebar.

8. Drive a small finishing nail or bobby pin between the element and handlebar to act as a retaining pin.

9. Insert a small piece of insulation in the end of the handlebar; then install grip.

NOTE: If handlebar grips are secured with spring pins, take care when installing pins to ensure that the pin does not gouge the lead wires during installation.

10. Slide a small grommet over the two leads and move into position in the hole of the handlebar.

11. Repeat steps 3-10 on the remaining end of handlebar.

To install the wiring, use the following procedure:

1. Drill a 1/2-inch hole in a convenient location in the dash console; then mount the switch in the dash.

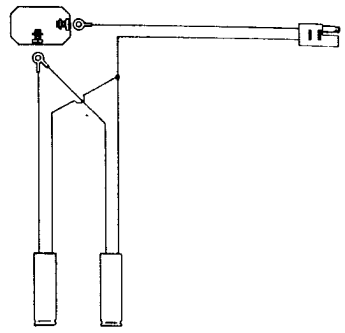
2. Thread the element leads along the steering post and through the console.

3. Connect one lead from each element to one of the terminals on the switch.

4. Connect the remaining leads to the female wire terminal of the accessory connector or a good chassis ground.

   Connect the lead from the accessory connector to the remaining terminal on the switch; then secure connector to the accessory connector of the main wiring harness.

Fig. 10-41



0725-624

6. Use cable ties to secure the wires to the handlebar. Make sure all wires are routed away from any hot or rotating components.

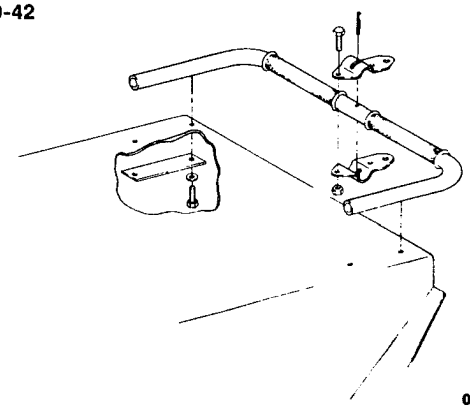
7. Install the handlebar pad.

The handlebar warmers may be used as required. The handlebar warmers need approximately 15 minutes to reach their maximum temperature.

Hitch Kit

Pantera 0136-034

Fig. 10-42



0725-563

Equipment Necessary: 1/4-inch drill, 5/32-inch bit, center punch, hammer, screwdriver, 7/16-inch open end wrench

To install the hitch kit on the Pantera, use the following procedure:

1. From the inside of the tunnel, remove the four (4) cap screws securing the rear bumper to the tunnel.

2. Place the two support plates over the bumper mounting holes; then replace the bumper mounting cap screws and tighten to 0.8 kg-m or 6 ft-lb.

3. Slide the rubber bumper grips apart to allow sufficient clearance to install the hitch bracket.

4. Using a drill with a 5/32-inch bit, drill a vertical hole in the center of the bumper.

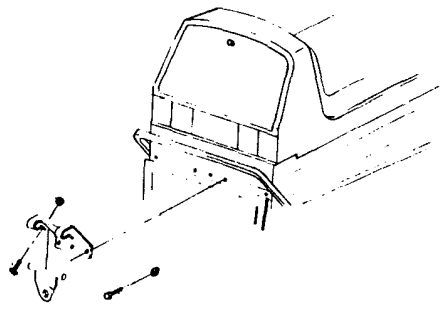
5. Tap the spring pin into the hole.

6. Place the brackets over the spring pin; then secure plates with two cap screws and lock nuts.

Panther, Cheetah 0136-037

Equipment Necessary: 1/4-inch drill, 9/32-inch bit, screwdriver, center punch, hammer

Fig. 10-43



0725-499

To install the hitch kit on the Panther or Cheetah, use the following procedure:

1. Center hitch bracket on the bumper.

2. After centering hitch on bumper, tap on a center punch through the existing holes in the bracket to mark the drilling area.

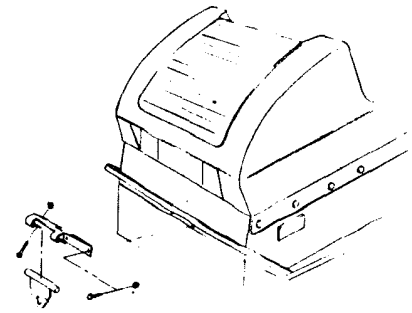
3. Drill three (3) 9/32-inch holes through the bumper; drill corresponding holes through appropriate places on the tunnel.

4. Mount the bracket and hitch assembly and tighten.

Jag 0136-031
Lynx 0136-088

Equipment Necessary: 1/4-inch drill, 9/32-inch bit, center punch, hammer

Fig. 10-44



0725-501

To install the hitch kit on the Jag or Lynx, use the following procedure:

1. Center hitch bracket on the bumper.

2. After centering hitch on the bumper, tap on a center punch through the existing holes in the bracket to mark the drilling area.

3. Drill two (2) 9/32-inch holes through the bumper.

4. Mount the bracket and hitch assembly and tighten.

Wheel Kit

Pantera FC 0136-116

Equipment Necessary: 1/2-inch open end wrench (2)

To install front auxiliary wheels, use the following procedure:

1. Check track for proper alignment (see owner's manual).

2. Secure the two (2) auxiliary wheel supports to pre-drilled holes in skid frame rails using four (4) 5/16-18 x 1 bolts and lock nuts.

3. Guide short axle through one support bracket.

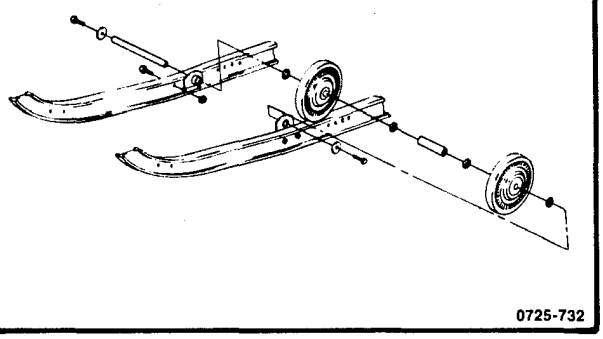
4. Continue to insert shaft. In order, place one (1) washer, wheel, washer, spacer, washer, wheel, and washer.

NOTE: Position the wheel so that the small diameter insert (on wheel) is positioned toward center of skid frame.

5. Insert shaft until ends are flush with support bracket.

6. Secure each end of axle with cap screws and flat washers. Tighten to 1.4 kg-m or 10 ft-lb.

Fig. 10-45



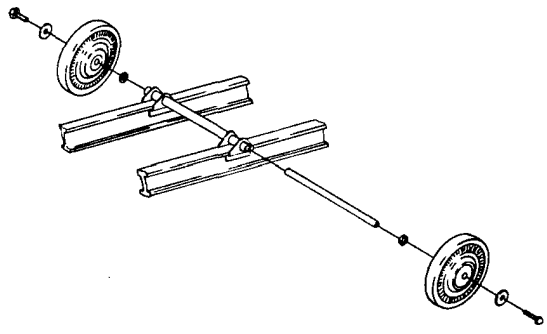
0725-732

To install the wheels on the shock mounting bracket, use the following procedure:

1. Slide long axle through shock mounting bracket.

2. On each end of axle, place one (1) 5/8-inch washer and wheel.

Fig. 10-46



0725-731

3. Place one (1) cap screw and flat washer on each end of axle. Tighten to 1.4 kg-m or 10 ft-lb.

Lynx 0136-090

Equipment Necessary: 7/16 open end wrench, 9/16 open end wrench, hacksaw, narrow tape measure.

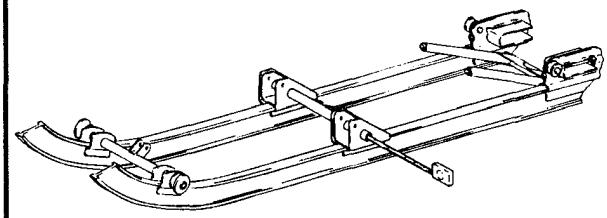
To install the wheel kit on the Lynx, the length of the front arm bracket tube must not exceed 25.9 cm or 10.18 inches. If the bracket is longer than 25.9 cm or 10.18 inches and the kit is installed, the wheels will not perform as designed. Use the following procedure to determine proper front arm bracket tube length:

1. Using a narrow tape measure, determine the inside length of the front arm bracket tube.

2. If measurement exceeds 25.9 cm or 10.18 inches, it will be necessary to remove the skid frame and reduce the length of the front arm bracket tube.

3. If measurement is 25.9 cm or 10.18 inches, proceed to install wheel kit.

Fig. 10-47



0725-714

Remove Skid Frame

If the front arm bracket tube exceeds 10.18 inches, the skid frame must be removed. To remove the skid frame, use the following procedure:

1. Remove the lock nuts from the rear suspension eyebolts; then remove the eyebolts.

2. Remove the four cap screws securing the skid frame to the tunnel.

3. Lift rear of snowmobile approximately 60 cm or two feet off floor using jack or hoist.

4. Pull the skid frame from within track.

Front Arm Bracket Removal

To shorten the front arm bracket, use the following procedure:

1. Determine the amount that must be removed from the front arm tube. Divide that amount by two. The new total must be removed from both ends of the front arm tube.

CAUTION

An equal amount must be removed from both ends of the front arm tube or proper wheel alignment with the track will not be obtained.

2. Using a hacksaw, remove the proper amount from both ends of the tube.

Install Skid Frame

To install the skid frame, use the following procedure:

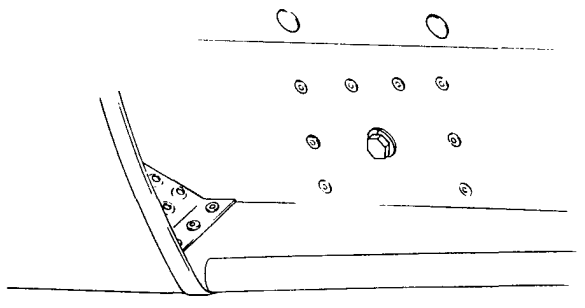
1. Spread a light coat of low temperature grease on the skid frame inner axles.

2. Tip snowmobile on its side. Use cardboard to protect against scratching.

3. Pull track away from body tunnel and install the skid frame in the track and tunnel.

4. Move front of skid frame into position with front mounting hole in the tunnel. Slide lock washer onto cap screw; then secure front arm to the tunnel. Thread in only halfway. DO NOT TIGHTEN.

Fig. 10-48



0725-017

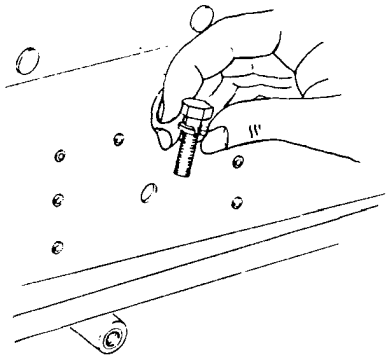
NOTE: To aid in the centering of the front arm with the holes in the tunnel, position skid frame and track at an angle to the bottom of the tunnel.

5. Push skid frame and track into the tunnel. Tip snowmobile onto opposite side.

6. Secure front arm to tunnel following instructions in step 4.

7. Move rear arm of skid frame into position with rear mounting holes in tunnel. Make sure suspension springs are in position on the rear arm.

Fig. 10-49



0725-018

8. Slide lock washers onto cap screws; then secure rear arm to tunnel. Thread in only halfway. DO NOT TIGHTEN.

NOTE: Rear arm of skid frame may not line up with mounting holes in tunnel. To obtain proper alignment of rear arm, drive rear arm in proper direction until alignment is obtained.

9. Tip snowmobile onto opposite side, use cardboard to protect against scratching.

10. Fasten rear arm to tunnel using directions in step 8.

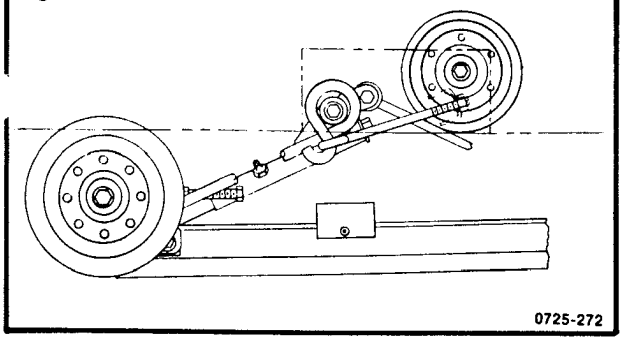
11. Tighten front and rear mounting cap screws to 2.9 - 3.6 kg-m or 21 - 26 ft-lb.

12. Install the suspension spring eyebolts onto the rear spring loops. Move the eyebolts into position in the tunnel brackets.

13. Install lock nuts on the threaded portion of the eyebolts; then tighten the eyebolts to obtain the desired tension setting.

14. With the machine on a safety stand or hoist, start the engine and allow the track to rotate several times. Check to ensure that the skid frame rails are positioned in the center of the track cleat cutouts.

Fig. 10-50



0725-272

15. If the track does not run in the center of the track cleat cutouts, an adjustment is necessary. If the track runs to the left, tighten the left track tension bolt. Conversely, if the track runs to the right side, tighten the right track tension bolt. After the track is centered, tighten the adjusting bolt jam nuts.

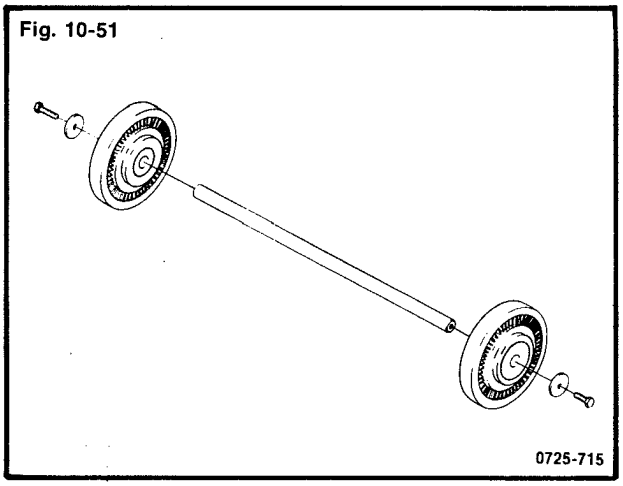
NOTE: Make sure that correct track alignment is maintained whenever the track alignment is adjusted.

Install Wheel Kit

To install the wheel kit, use the following procedure:

1. With the snowmobile in an upright position, slide the wheel kit axle through the front arm bracket axle housing. Equalize the amount of axle exposed on both sides of the axle housing.
2. Place a 21/32 x 1-1/8 washer on wheel axle.
3. Place SMALL insert side of wheel on axle.

Fig. 10-51



0725-715

4. Place larger washer on axle and secure with nut. Tighten to 1.4 kg-m or 10 ft-lb.
5. Repeat process for opposite side.
6. Check alignment of wheels. If alignment is not correct, add washer to the outside of wheel until alignment is achieved. Never remove more washers than is provided in kit.

CAUTION

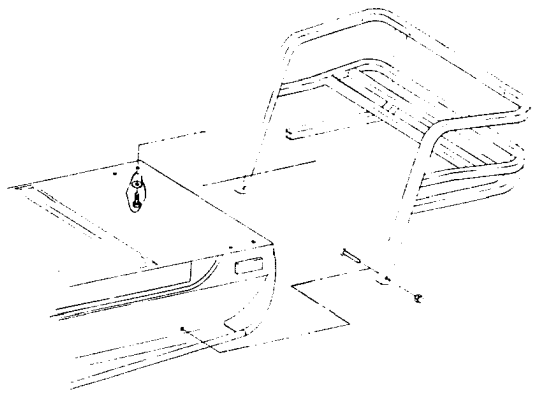
Wheel axle must not rotate. Only bearing within wheel should rotate. If bearing fails to rotate, it is defective and must be replaced as an assembly.

Safari Rak Kit

Pantera 0136-086

Safari Tote Bag 0136-087

Fig. 10-52



0725-642

Equipment Necessary: Electric drill, 1/4-inch bit, standard screwdriver, 7/16-inch open end wrench

To install the Safari Rack for the '76-'78 Pantera, use the following procedure:

1. Remove bumper.

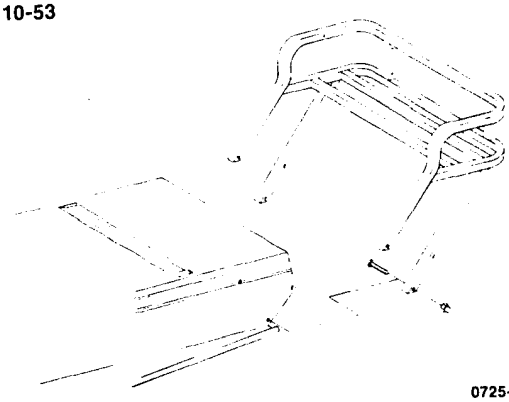
2. Align Safari Rak with pre-drilled holes vacated from bumper removal. Secure with four (4) screws and washers to existing rivet nuts.

3. Drill two 1/4-inch holes for the top bar through the tunnel. Secure with two (2) screws and nuts.

NOTE: If Safari Rak does not align with existing holes in tunnel, use an electric drill and bit to rout hole until alignment is achieved.

Panther, Cheetah 0136-085
Safari Tote Bag 0136-087

Fig. 10-53



0725-643

Equipment Necessary: Electric drill, 1/4-inch bit, standard screwdriver, 7/16-inch open end wrench

To install the Safari Rak for the '73-'78 Panther or Cheetah, use the following procedure:

1. Remove bumper.

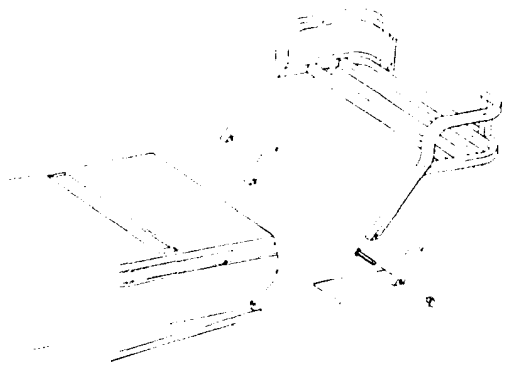
2. Align Safari Rak with pre-drilled holes vacated from bumper removal. Secure with four (4) screws and nuts.

3. Drill two 1/4-inch holes for top, bar through tunnel. Secure with two (2) screws and nuts.

NOTE: If Safari Rak does not align with existing holes in tunnel, use an electric drill and bit to rout new hole until alignment is achieved.

Jag 0136-084
Safari Tote Bag 0136-087

Fig. 10-54



0725-643

Equipment Necessary: Electric drill, 1/4-inch bit, standard screwdriver, 7/16-inch open end wrench

To install the Safari Rak on the '75-'78 Jag, use the following procedure:

1. Remove bumper.

2. Align Safari Rak with the pre-drilled holes vacated from bumper removal. Secure with four (4) screws and nuts.

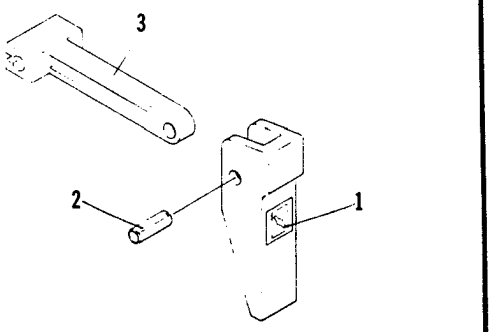
3. Drill two 1/4-inch holes for the top bar through tunnel. Secure with two (2) screws and nuts.

NOTE: If Safari Rak does not align with existing holes in tunnel, use electric drill and bit to rout hole until alignment is achieved.

Choke Lever Repair Kit

Pantera, Panther, Cheetah, Jag, Lynx 0136-104

Fig. 10-55



Equipment Necessary: Regular screwdriver, hammer, punch

To install the choke lever repair kit, use the following procedure:

1. Remove knurled nut securing choke lever to console.
2. Slide choke lever through console.
3. Remove choke cable from carburetor.
4. Using a punch and hammer, gently tap out the pin securing the choke lever.
5. Separate halves of the choke control box.
6. Slide choke cable from the existing tee and remove spring.
7. Install spring on tee from kit and connect choke cable.
8. Place assembly in position in the control box. Be sure choke cable is secured to tee.
9. Place pin from the kit in the choke lever and align with the hole in the tee. Using a hammer and punch, gently tap pin until pin is flush with lever.
10. Place cover in the control box and secure.
11. Connect choke cable assembly to carburetor.
12. Place choke lever in console and secure with knurled nut.
13. Check operation of choke lever.

High Altitude Kit

To locate the high altitude kit for each model of Arctic Cat snowmobile, refer to the accessory chart on page 181.

Pantera FC 0136-115

Kit consists of:

Part No.	Qty.	Description
0146-108	6	Weight
6505-320	1	Jet Kit (280 & 290 Main Jet)

NOTE: E-ring on jet needle in carburetor must be changed from fourth step to third step.

Pantera FA 0136-044

Kit consists of:

Part No.	Qty.	Description
0146-106	6	Weight
6505-266	1	Jet Kit

Panther 5000, Cheetah 5000 0136-106

Kit consists of:

Part No.	Qty.	Description
0146-105	6	Weight
6505-314	1	Jet Kit (260 & 270 Main Jet)
6505-215	1	Jet Needle (6DH7-2)

Panther 4000 0136-107

Kit consists of:

Part No.	Qty.	Description
16-068	1	Spring
.46-105	6	Weight
0146-294	3	Ramp
0146-355	3	Roller/Bearing Assy.
6505-313	1	Jet Kit (240 & 250 Main Jet)

Jag 3000 0136-112

Kit consists of:

Part No.	Qty.	Description
0146-068	1	Spring, Compression 64 lb.
0146-106	6	Weight
6505-316	1	Jet Kit (180 & 190 Main Jet)

NOTE: E-ring on jet needle in carburetor must be changed from third to second step.

Jag 2000 0136-113

Kit consists of:

Part No.	Qty.	Description
0146-175	6	Weight
6505-315	1	Jet Kit (160 & 170 Main Jet)

NOTE: E-ring on jet needle in carburetor must be changed from the third step to the second step.

Lynx T 0136-108

Kit consists of:

Part No.	Qty.	Description
0146-175	6	Weight
6505-269	1	Jet Kit (130 & 140 Main Jet)

NOTE: E-ring on jet needle in carburetor must be changed from the third step to the second step.

Lynx S 0136-109

Kit consists of:

Part No.	Qty.	Description
0146-068	1	Spring
0146-175	6	Weight
6505-312	1	Jet Kit (120 & 130 Main Jet)

SECTION 11 — TROUBLESHOOTING

TABLE OF CONTENTS

Engine

Problem	Condition	Remedy
Engine will not start because there is no spark	1. Ignition switch not ON or malfunctioning.	1. Turn switch ON or replace ignition switch.
	2. Short in wiring harness.	2. Repair or replace.
	3. Emergency shut-off switch in OFF position or malfunctioning.	3. Move switch to ON or replace the emergency shut-off switch.
	4. Throttle safety switch adjusted incorrectly.	4. Adjust throttle safety switch (cable tension).
	5. Spark plug fouled, oiled or damaged.	5. Replace the spark plug.
	6. RFI suppressor cap damaged, leaking or shorted.	6. Replace RFI suppressor cap.
	7. High tension wire loose, grounded or shorted.	7. Service high tension wire/coils.
	8. Defective CDI box.	8. Replace CDI box.
	9. Defective exciting coil.	9. Replace exciting coil.
	10. Defective pulser coil.	10. Replace pulser coil.
	11. Defective ignition coil.	11. Replace ignition coil.
	12. Faulty condenser (2000S)	12. Replace condenser.
	13. Weak flywheel magnets.	13. Replace the flywheel.
Engine will not start because it does not get fuel	1. Fuel tank empty.	1. Fill fuel tank with fuel.
	2. Cracked, broken or pinched fuel line.	2. Replace the fuel line.
	3. Obstructed or damaged in-line filter.	3. Clean or replace in-line filter.
	4. Fuel pump malfunctioning.	4. Service the fuel pump.
	5. Impulse line is cracked, broken or pinched.	5. Replace the impulse line.
	6. Carburetor adjusted incorrectly.	6. Adjust the carburetor.
	7. Inlet needle stuck.	7. Repair or replace inlet needle and seat or clean carburetor.
	8. Float adjustment incorrect.	8. Adjust float arm height.
	9. Air leak between cylinder and carburetor.	9. Examine insulator block and carburetor flange for correct sealing.

Problem	Condition	Remedy
Engine will not start because fuel will not ignite	1. Air leak between carburetor, insulator block or intake manifold.	1. Tighten mounting bolt and nuts, or service the insulator block (sealing surfaces must be flat).
	2. Carburetor fuel and/or air screws adjusted incorrectly.	2. Adjust the carburetor.
	3. Water in the carburetor.	3. Disassemble and clean carburetor.
	4. Engine is flooded.	4. Turn ignition switch OFF, remove spark plug and dry it. Crank engine over 5 - 10 times. Finally, install spark plug and start engine. If engine continues to flood, service the carburetor.
	5. No compression (caused by worn or broken rings, scored piston, hole in piston or damaged cylinder).	5. Check compression and replace worn or damaged parts.
	6. Blown head gasket.	6. Replace head gasket.
Engine will not idle or idle rpm fluctuates	1. Idle air screw adjusted incorrectly.	1. Adjust idle air screw and throttle stop screw.
	2. Throttle stop screw adjusted incorrectly.	2. Adjust the throttle stop screw and idle air screw.
	3. Defective fuel pump (check valve).	3. Service the fuel pump (check valve).
	4. Tip of air screw broken off and embedded in the main carburetor body casting.	4. Replace the air screw and the main carburetor body casting.
	5. Impulse line cracked, kinked or broken.	5. Replace or service the impulse line.
Engine developes power loss or runs on one cylinder	1. Vent hole in fuel tank gauge cap obstructed.	1. Remove obstruction from vent hole by washing in gasoline; then use compressed air to blow out any remaining dirt.
	2. Fouled or defective spark plug(s).	2. Replace the spark plug(s).
	3. Obstruction inside of muffler.	3. Remove obstruction or replace the muffler.
	4. Defective CDI box.	4. Replace CDI box.
	5. In-line filter obstructed.	5. Clean filter or replace filter if it is defective.
	6. Carbon buildup in exhaust port.	6. Clean exhaust port.
	7. Defective pulsing coil.	7. Replace pulsing coil.
	8. Rings worn excessively.	8. Replace the rings.
	9. Crankcase pressure is low.	9. Check for crankcase leaks (end seal, cylinder base gasket or between crankcase halves); then replace seal or gasket, or reseal the crankcase halves.
	10. Hole in top of piston.	10. Replace the piston and any affected component(s). Also, clean crankcase and crankshaft.
	11. Blown head gasket.	11. Replace head gasket.

Problem	Condition	Remedy
	12. Broken (shorted) high tension wire.	12. Replace complete ignition coil.
	13. Defective RFI suppressor cap.	13. Replace RFI suppressor cap.
Engine overheats	1. Excessive carbon deposits in combustion chamber, exhaust port or muffler.	1. Clean affected components.
	2. Stiff rings caused by excessive carbon buildup.	2. Clean or replace rings.
	3. Cooling fins obstructed.	3. Clean cooling fins.
	4. Spark plug heat range too hot.	4. Install spark plug having lower heat range.
	5. Carburetor adjusted incorrectly.	5. Adjust carburetor.
	6. Air leak between carburetor, intake manifold or cylinders.	6. Seal affected component(s).
	7. Drive system (drive clutch, driven pulley, drive belt and track) adjusted, worn or working improperly.	7. Troubleshoot the drive system.
	8. Incorrect fuel/oil mixture ratio (too lean).	8. Make sure correct fuel/oil mixture is being used.
Engine backfires or has irregular running condition	1. Throttle safety switch adjusted incorrectly.	1. Adjust throttle safety switch (tension throttle wire).
	2. High tension wire sporadically shorting out.	2. Replace complete ignition coil.
	3. Fouled or incorrect spark plug (heat range too hot).	3. Replace spark plug or install spark plug having colder heat range.
Note: Engine may eventually overheat	4. Air leak between carburetor and cylinder.	4. Service the carburetor insulator block to make sure it is not warped.
Engine four-cycles	1. Carburetor adjusted incorrectly.	1. Adjust the carburetor.
	2. Dirt between needle valve and valve seat.	2. Service the carburetor.
Engine stops (suddenly) after it has been running	1. Defective ignition coil.	1. Replace ignition coil.
	2. Obstructed in-line fuel filter.	2. Clean or replace filter.
	3. Fuel line obstructed or pinched.	3. Remove obstruction or kinked area out of fuel line.
	4. Defective CDI box.	4. Replace CDI box.
	5. Spark plug bridged.	5. Replace spark plug.
	6. Seized piston(s).	6. Replace piston and any affected components.
	7. Seized crankshaft.	7. Replace crankshaft and any affected components.
	8. Defective exciter coil.	8. Replace exciter coil.
	9. Defective pulsing coil.	9. Replace pulsing coil.

Problem	Condition	Remedy
Engine stops (gradually) after it has been running	1. Obstructed fuel tank or in-line fuel filter.	1. Clean or replace filters.
	2. Fuel line obstructed or pinched.	2. Remove obstruction or get pinched area out of fuel line.
	3. Head gasket gradually burning away.	3. Replace head gasket.
	4. Cylinder head gradually loosening.	4. Tighten cylinder head nuts to correct torque value.
	5. Spark plug(s) gradually loosening.	5. Tighten spark plugs to correct torque value.

Fuel System

0 - 1/4 Throttle Opening		
Problem	**Condition**	**Remedy**
Too rich	1. Too large pilot jet.	1. Replace with smaller pilot jet.
	2. Clogged pilot air intake, pilot jet air passage, or air bleed opening.	2. Thoroughly disassemble and clean carburetor.
	3. Pilot jet mounting loose.	3. Tighten pilot jet.
	4. Starter plunger not seated.	4. Readjust starter cable linkage.
Too lean	1. Pilot jet or jet outlet obstructed.	1. Thoroughly disassemble and clean carburetor.
	2. Throttle valve has worn and developed play.	2. Replace throttle valve.
	3. Carburetor mounting loose, causing an air leak.	3. Check mounting for tightness and correct sealing.

1/4 - 3/4 Throttle Opening		
Problem	**Condition**	**Remedy**
Too rich	1. Problem in low-speed circuit.	1. See above.
	2. Blocked air passage, air jet, or the air bleed opening of the needle jet.	2. Thoroughly disassemble and clean carburetor.
	3. Larger needle jet/jet needle clearance due to needle jet wear.	3. Replace needle jet.
Too lean	1. Problem in low-speed circuit.	1. See above.
	2. Dirt collecting in the main jet or needle jet.	2. Thoroughly disassemble and clean carburetor.

3/4 - Full Throttle Opening		
Problem	**Condition**	**Remedy**
Too rich	1. Too large main jet.	1. Replace with a smaller main jet.
Too lean	1. Too small main jet.	1. Replace with a larger main jet.

General		
Problem	**Condition**	**Remedy**
Engine cuts out at high rpm	1. Fuel pump does not supply adequate fuel. 2. Float level too low. 3. Fuel line filters clogged. 4. Moisture in fuel lines.	1. Repair or replace. 2. Readjust float level setting. 3. Clean or replace. 4. Add gas line de-icer and clean carburetors.
Engine runs leaner on one side	1. Carburetor flange leaking. 2. Air silencer has loose internal baffle. 3. Crankcase leaking.	1. Reseal or replace. 2. Replace air silencer. 3. Disassemble and reseal.

Drive Clutch

Problem	Condition	Remedy
Drive clutch engages before specified rpm	1. Wrong spring. 2. Weak spring. 3. Wrong weights. 4. Wrong ramps. 5. Set screws holding spider to hex shaft loose.	1. Check specifications for correct spring. 2. Check spring pressure. 3. Check specification for correct weights. 4. Check specifications for correct ramps. 5. Check hex shaft for damage. Tighten spider set screws.
Drive clutch engages after specified rpm	1. Wrong spring. 2. Wrong weights. 3. Wrong ramps. 4. Dirty clutch. 5. Worn (flat spots) rollers and ramps. 6. Bushing in cover housing and moveable sheave worn excessively on inside diameter. 7. Worn drive belt. 8. Set screws holding spider to hex shaft loose.	1. Check specifications for correct spring. 2. Check specifications for correct weights. 3. Check specifications for correct ramps. 4. Clean clutch. 5. Replace rollers and ramps. 6. Replace appropriate parts. See parts manual. 7. Replace if top width less than 1-1/16". 8. Check hex shaft for damage - tighten spider set screws.
Maximum drive clutch rpm too high	1. Weights too light. 2. Wrong ramps (ramp angle too steep at top). 3. Wrong spring (too heavy). 4. Dirty clutch. 5. Set screws holding spider to hex shaft loose.	1. Check specifications for correct weights. 2. Check specifications for correct ramps. 3. Check specifications for correct spring. 4. Clean clutch. 5. Check hex shaft for damage. Tighten spider set screws.
Maximum drive clutch rpm too low	1. Weights too heavy. 2. Wrong ramp (ramp angle too flat at top). 3. Wrong spring (too light).	1. Check specifications for correct weights. 2. Check specifications for correct ramps. 3. Check specifications for correct spring.
Shift up through midrange takes place too quickly (pulls rpm down)	1. Weights too heavy. 2. Wrong ramps (ramp angle too flat). 3. Drive clutch spring too weak. 4. Wrong spring (too weak).	1. Check specifications for correct weights. 2. Check for specifications for correct ramps. 3. Check spring pressure. 4. Check specifications for correct spring.

Problem	Condition	Remedy
	5. Driven pulley spring preload too loose.	5. Increase driven pulley spring preload.
	6. Driven pulley spring too weak.	6. Replace driven pulley spring.
	7. Clutches center-to-center distance too close.	7. Check specifications for correct center-to-center distance.
Shift up through midrange takes place too slowly (rpm too high)	1. Weights too light.	1. Check specifications for correct weights.
	2. Wrong ramps (ramp angle too steep).	2. Check specifications for correct ramps.
	3. Dirty drive clutch.	3. Clean drive clutch.
	4. Dirty driven clutch.	4. Clean driven clutch.
	5. Wrong spring (too strong).	5. Check specifications for correct spring.
	6. Driven clutch spring preload too tight.	6. Decrease driven clutch spring preload.
	7. Wrong driven clutch spring.	7. Check specifications for correct spring.
Belt deposits on drive clutch face or hex shaft	1. Wrong "offset".	1. Remove belt deposits and establish correct "offset" see specifications.
	2. Belt worn because of high hourly usage.	2. Install new belt and check center-to-center distance and offset - see specifications.
	3. Wrong drive belt.	3. Check specifications for correct drive belt.
	4. Lubricant on clutch sheaves.	4. Clean clutch sheaves.
Drive clutch does not disengage at idle - engine starts hard and has tendency to stall because of belt drag	1. Moveable sheave Duralon bearing set screw backed out.	1. Stake moveable sheave Duralon bearing set screws.
	2. Drive belt outside circumference below specifications.	2. Check drive belt specifications (outside circumference).
	3. Thickness of belt on inside diameter exceeds specifications.	3. Check drive belt specifications (belt thickness on inside diameter).
	4. Center-to-center distance of the clutches too long.	4. Check center-to-center specifications.
	5. Drive clutch dirty and will not disengage.	5. Clean drive clutch.
Engine rpm have increased suddenly	1. Pins holding spider arms are bent or broken.	1. Replace spider.
	2. Broken spider arm.	2. Replace spider.
	3. Bolt retaining clutch weights broken.	3. Replace bolt and check for correct weight specifications.
Drive clutch shift pattern has slowly changed after much usage	1. Spider arm roller bearings worn.	1. Normal wear - replace roller bearings.
	2. Ramp surface worn uneven.	2. Replace ramps - see specifications.
	3. Duralon hex bearing worn.	3. Inspect and measure bearings for wear.
Drive clutch out of balance	1. Drive clutch components are not assembled correctly.	1. Reassemble - check alignment marks for proper installation.

Driven Clutch

Problem	Condition	Remedy
Engine rpm low and belt shifted completely through driven clutch	1. Weak spring. 2. Broken spring. 3. Spring unhooked from torque bracket.	1. Increase driven clutch spring tension. 2. Install new spring. 3. Install spring - see specifications for proper spring preload.
Engine rpm high and belt takes too long to shift through driven clutch	1. Wrong spring - too heavy. 2. Driven clutch spring preload too tight. 3. Sliding shoes worn excessively. 4. Dirty driven clutch hub. 5. Worn driven clutch bearing.	1. Install correct spring. 2. Decrease spring tension. 3. Install new sliding shoes. 4. Clean driven pulley. 5. Install new bearing.
Driven clutch does not "downshift" - rpm pull down below engine power band	1. Worn driven clutch bearing. 2. Weak spring. 3. Broken spring.	1. Install new bearing. 2. Increase driven clutch spring tension. 3. Install new spring.
Belt deposits on driven clutch sheaves	1. Driven clutch moveable sheave travel less than specifications. 2. Worn driven clutch bearing. 3. Driven clutch bearing dirty. 4. Lubricant on clutch sheaves.	1. Check specifications for moveable sheave travel. 2. Install new bearing. 3. Clean clutch bearing. 4. Clean clutch sheaves.
Driven clutch out of balance	1. Rivets holding sheaves to castings missing.	1. Replace sheaves.

Drive Belt

Problem	Condition	Remedy
Normal belt side wear	1. Normal and minimal side pressure applied to belt.	1. Install new belt - wear is normal.
Belt will not shift to top of drive clutch (1:1 ratio)	1. Belt worn across top surface (less than 1-1/16") after many hours of use.	1. Install new belt - wear is normal.
Cracks between belt lugs when flexed	1. Occurs after many hours of use.	1. Install new belt - wear is normal.
Belt will shift to the top of the drive clutch but poor top speed	1. Belt outside circumference too long. 2. Wrong belt - excessive slippage.	1. Check belt specifications. 2. Install correct belt - See Parts Manual.
Snowmobile has poor acceleration (bogs on engagement)	1. Belt outside circumference too long. 2. Belt worn across top surface (less than 1-1/16").	1. Check belt specifications. 2. Install new belt.
Belt is glazed or baked on its side - not normal and is caused by heat buildup	1. Wrong belt - excessive slippage. 2. Driver applied too much throttle under heavy load - excessive slippage. 3. Weak drive clutch spring. 4. Drive clutch engagement rpm too low. 5. Belt too long - excessive slippage on engagement. 6. Improper drive clutch operation (sticking, etc.). 7. Drive and driven clutch "offset/parallelism" is not correct. 8. Grease on drive clutch or driven clutch sheaves. 9. Wrong drive clutch ramps - excessive slippage.	1. Install correct belt - See Parts Manual. 2. Tell driver to decrease throttle under heavy load conditions; install new belt. 3. Perform spring pressure tests; install new spring if spring is weak. 4. Adjust engagement rpm - See specifications. 5. Install new drive belt. 6. Remove and service drive clutch; install new belt if one is needed. 7. Check and adjust "offset/parallelism", install new belt if one is needed. 8. Clean sheaves; install new belt if one is needed. 9. Check specifications for correct ramps.

Problem	Condition	Remedy
Lugs torn off inside of belt	1. Drive clutch engages suddenly (engagement speed too high). 2. Drive belt outside circumference too short. 3. Clutch center-to-center distance too close.	1. Remove and service drive clutch; install new belt, if one is needed. 2. Check drive belt specifications. 3. Check center-to-center specifications.
Belt worn in one spot	1. Track frozen to skid frame or front drive. 2. Track tension too tight. 3. Idle speed too high - engaging belt. 4. Improper operation of drive clutch. 5. Driven clutch does not turn freely - check bearings.	1. Free the track and install new belt. 2. Adjust track tension and install new belt. 3. Reduce idle rpm and install new belt. 4. Repair or replace drive clutch and install new belt. 5. Check all components in drop case for failure.
Cracks at base of belt lug	1. Continuous over reving when snowmobile is operated.	1. Decrease rpm and install new belt.
Belt disintegrates	1. Drive clutch and driven clutch "offset/parallelism" is incorrect.	1. Check and adjust "offset/parallelism"; install new belt after correct adjustments are made.
Frayed or broken cord on side of belt	Drive clutch and driven clutch "offset/parallelism" is incorrect.	Check and adjust "offset/parallelism"; install new belt after correct adjustments are made.
Belt turns over at high speeds	Drive clutch and driven clutch "offset/parallelism" is incorrect.	Check and adjust "offset/parallelism"; install new belt after correct adjustments are made.
Belt side wear usually occurs after belt is glazed or baked because of slippage	Drive clutch and driven clutch "offset/parallelism" is incorrect.	Check and adjust "offset/parallelism"; install new belt after correct adjustments are made.

Chain/Sprocket

Problem	Condition	Remedy
Chain rattles in chain case	1. Chain tension too loose. 2. Chain stretched beyond adjustable limit. 3. Wear pad in chain case worn badly. 4. Tightener broken.	1. Adjust chain tension. 2. Install new chain and check sprockets for damage. 3. Replace wear pad - see Parts Manual. 4. Replace tightener - see Parts Manual.
Chain rachets	1. Chain tension too loose. 2. Wear pad in chain case worn badly. 3. Tightener broken. 4. Chain stretched beyond adjustable limit. 5. Sprocket teeth worn.	1. Adjust chain tension. 2. Replace wear pad - see Parts Manual. 3. Replace tightener - see Parts Manual. 4. Install new chain and check sprockets for damage. 5. Install new sprockets and check chain for damage.
Chain slips off sprockets	1. Chain tension too loose. 2. Wear pad in chain case worn badly. 3. Tightener broken. 4. Sprocket teeth worn. 5. Sprockets misaligned.	1. Adjust chain tension. 2. Replace wear pad - see Parts Manual. 3. Replace tightener. 4. Install new sprocket and check chain for damage. 5. Align top sprocket with bottom sprocket.
No chain case lubricant	1. Cover seal damaged. 2. Drop case plug missing. 3. O-ring seals on chain case bearings damaged.	1. Replace seal - fill with "Arctic Chain Lube". 2. Install new drop case plug - fill with "Arctic Chain Lube". 3. Replace O-ring seals and fill with "Arctic Chain Lube".

Track

Problem	Condition	Remedy
Edge of track is frayed	1. Track is misaligned. 2. Outer belts worn out because of hourly usage.	1. Set track tension and alignment. 2. Install new outer belt(s).
Track is grooved (worn) or burnt on inside surface of outer belt(s).	1. Track tension is too tight. 2. Rear idler wheels do not turn or are otherwise damaged.	1. Set track tension and alignment. 2. Install new rear idler wheels and set track tension and alignment.
Track is grooved or gouged on center belt	1. Center brace(s) of skid frame hanging down and contacting inside surface of center belt.	1. Repair skid frame center brace and install new center belt if it is damaged.
Internal drive lugs worn on inside surface	1. Track is misaligned.	1. Set track tension and alignment. If lugs are worn excessively, install new outer belt(s).
Track ratchets or hits on body tunnel (top)	1. Track tension is too loose. 2. Track drive sprockets not timed in relation to the drive lugs. 3. Track drive sprockets turn on shaft. 4. Internal drive lugs worn because of hourly usage.	1. Set track tension and alignment. 2. Install new track drive and replace outer belt(s) if drive lugs are worn excessively. 3. Install new track drive and replace outer belt(s) if drive lugs are worn excessively. 4. Install new outer belt(s).
Accelerated hi-fax wear	1. Slide rail(s) is bent. 2. Worn cleat on surface that contacts hi-fax. 3. Track is misaligned.	1. Straighten slide rail(s) or install new skid frame. 2. Install new hi-fax or cleats. 3. Set track tension and alignment.

Light System

Problem	Condition	Remedy
No taillight	1. Bad bulb.	1. Check bulb with ohmmeter for resistance. Ohmmeter should register a low resistance.
	2. Poor ground.	2. Check socket or ground wire to socket with ohmmeter. Meter should read closed.
	3. Broken wire.	3. Remove seat, disconnect taillight wires from wiring harness. Check between hot wire in socket and connector with ohmmeter. Meter must read closed.
No headlight	1. Bad bulb.	1. Check bulb with ohmmeter for resistance. Meter should register low resistance.
	2. Poor ground.	2. Check ground wire (brown) with ohmmeter. Check between headlight connector and chassis. Meter should read closed.
	3. Broken wire.	3. Check for broken wire between connector at headlight and switch. Meter should read CLOSED. If meter reads OPEN wire is broken.
Bulbs continue to burn out when replaced	1. Voltage regulator is not regulating voltage; caused by either a poor grounding or a defective regulator.	1. Using an AC voltmeter, regulator output must not exceed 15 volts at 3000 RPM. 2. To make this check, connect one lead of voltmeter to hot wire at headlight connector, and ground the other lead of meter to the chassis. 3. If current is found to be above 15 volts, remove the voltage regulator and check regulator ground. If grounding point is corroded, clean with sandpaper and re-install regulator. Recheck output. If still above 15 volts, replace regulator.
No lights; complete failure of both the headlight and taillight.	1. Bulbs burned out.	1. Remove taillight and check with ohmmeter for resistance. Meter should read a low resistance. If the bulb is found to be defective, check the remaining bulb. If all are found to be bad, proceed to item three in Problem column.
	2. Poor ground.	2. Check for continuity between light bulb socket and chassis with ohmmeter. Should have a closed reading.
	3. Malfunctioned switch.	3. Disconnect switch and check operation of switch with ohmmeter. Meter should read open with switch in OFF position and closed in the ON position. Replace switch if necessary.
	4. Malfunctioned light coil.	4. Check between yellow wires from engine with voltmeter. Put rear of machine on a stand and run it for this test. Check service manual for correct output.

Problem	Condition	Remedy
Brakelight fails to work when brakes are applied	1. Bad bulb.	1. Check bulb with ohmmeter for resistance. Meter should register a low resistance if bulb is good.
	2. Bad ground.	2. Check brakelight socket for ground with ohmmeter. Connect one lead of meter to the socket and ground the other lead to the chassis. Meter must read closed.
	3. Defective switch.	3. Disconnect brakelight switch from wiring harness. Connect one lead of ohmmeter to one of the terminals in connector that goes to brake switch. Connect the other lead of ohmmeter to remaining terminal in connector. Meter must read OPEN. Squeeze the brake lever. Meter must now read CLOSED.

SECTION 12 — AIDS FOR MAINTENANCE

TABLE OF CONTENTS

Torque Conversions

ft-lb	kg-m	ft-lb	kg-m	ft-lb	kg-m	ft-lb	kg-m
1	.1	28	3.9	55	7.6	82	11.3
2	.3	29	4.0	56	7.7	83	11.5
3	.4	30	4.2	57	7.9	84	11.6
4	.6	31	4.3	58	8.0	85	11.8
5	.7	32	4.4	59	8.2	86	11.9
6	.8	33	4.6	60	8.3	87	12.0
7	1.0	34	4.7	61	8.4	88	12.2
8	1.1	35	4.8	62	8.6	89	12.3
9	1.2	36	5.0	63	8.7	90	12.5
10	1.4	37	5.1	64	8.9	91	12.6
11	1.5	38	5.3	65	9.0	92	12.8
12	1.7	39	5.4	66	9.1	93	12.9
13	1.8	40	5.5	67	9.3	94	13.0
14	1.9	41	5.7	68	9.4	95	13.1
15	2.1	42	5.8	69	9.5	96	13.3
16	2.2	43	5.9	70	9.7	97	13.4
17	2.4	44	6.1	71	9.8	98	13.6
18	2.5	45	6.2	72	10.0	99	13.7
19	2.6	46	6.4	73	10.1	100	13.8
20	2.8	47	6.5	74	10.2		
21	2.9	48	6.6	75	10.4		
22	3.0	49	6.8	76	10.5		
23	3.2	50	6.9	77	10.7		
24	3.3	51	7.1	78	10.8		
25	3.5	52	7.2	79	10.9		
26	3.6	53	7.3	80	11.1	kg-m x 7.235 = ft-lb	
27	3.7	54	7.5	81	11.2	ft-lb x .1383 = kg-m	

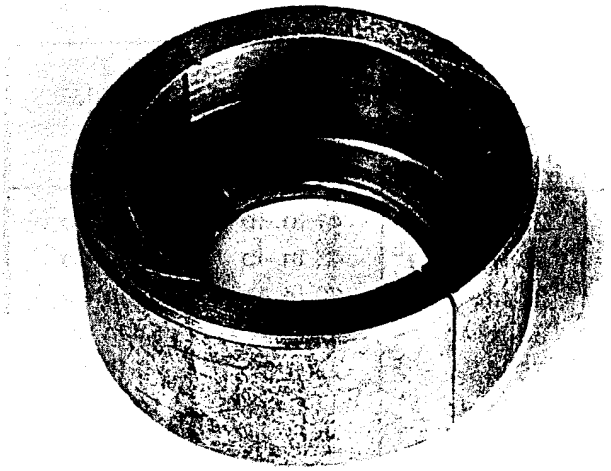
Bolt Torque Specifications

SIZE	SAE GRADE 2 ASSEMBLY TORQUE		SAE GRADE 5 ASSEMBLY TORQUE		SAE GRADE 8 ASSEMBLY TORQUE	
	DRY	LUB.	DRY	LUB. ■	DRY	LUB.
8-32	19 in.-lb	14 in.-lb	30 in.-lb	22 in.-lb	41 in.-lb	31 in.-lb
8-36	20 in.-lb	15 in.-lb	31 in.-lb	23 in.-lb	43 in.-lb	32 in.-lb
10-24	27 in.-lb	21 in.-lb	43 in.-lb	32 in.-lb	60 in.-lb	45 in.-lb
10-32	31 in.-lb	23 in.-lb	49 in.-lb	36 in.-lb	68 in.-lb	51 in.-lb
1/4-20	66 in.-lb	50 in.-lb	8 ft-lb	75 in.-lb	12 ft-lb	9 ft-lb
1/4-28	76 in.-lb	56 in.-lb	10 ft-lb	86 in.-lb	14 ft-lb	10 ft-lb
5/16-18	11 ft-lb	8 ft-lb	17 ft-lb	13 ft-lb	25 ft-lb	18 ft-lb
5/16-24	12 ft-lb	9 ft-lb	19 ft-lb	14 ft-lb	28 ft-lb	20 ft-lb
3/8-16	20 ft-lb	15 ft-lb	30 ft-lb	23 ft-lb	45 ft-lb	33 ft-lb
3/8-24	23 ft-lb	17 ft-lb	35 ft-lb	25 ft-lb	50 ft-lb	35 ft-lb
7/16-14	32 ft-lb	24 ft-lb	50 ft-lb	35 ft-lb	70 ft-lb	55 ft-lb
7/16-20	36 ft-lb	27 ft-lb	55 ft-lb	40 ft-lb	80 ft-lb	60 ft-lb
1/2-13	50 ft-lb	35 ft-lb	75 ft-lb	55 ft-lb	110 ft-lb	80 ft-lb
1/2-20	55 ft-lb	40 ft-lb	90 ft-lb	65 ft-lb	120 ft-lb	90 ft-lb

■ **NOTE: Lub. includes lubricants, lubricity and plating on fasteners.**

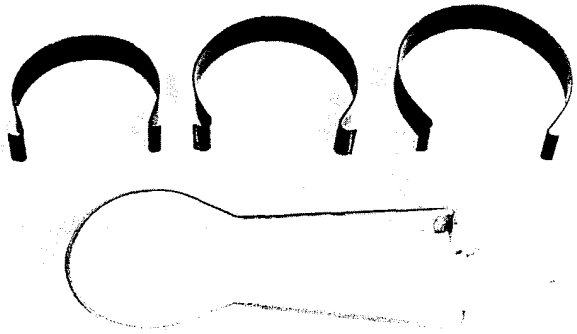
Tools

Arctic Spirit Engines



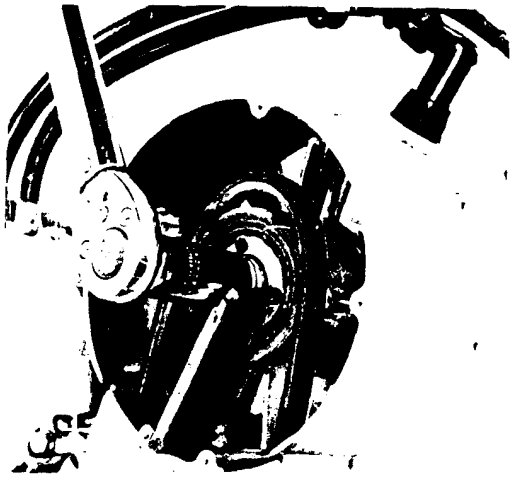
A363

0144-115
Bearing Puller Shells
For 4000 & 5000 Series Spirit engines.



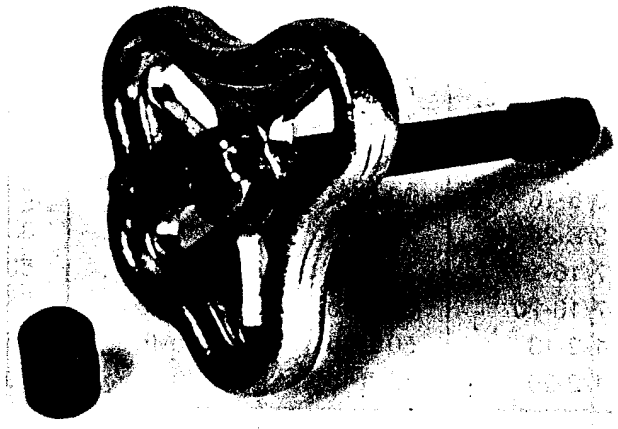
A358

0114-001
Piston Ring Clamp with Compression Bands
For all Arctic Cat engines.



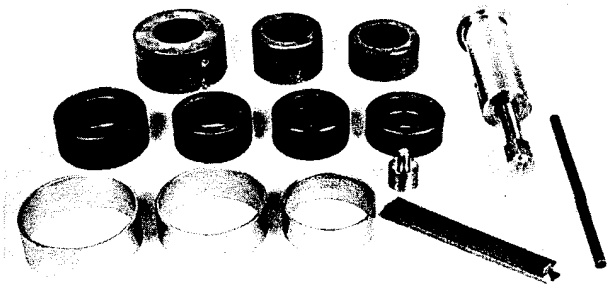
A354

0144-113
Fan Holder - Spirit Engine
Use to hold axial fan pulley on all axial fan Spirit engines.



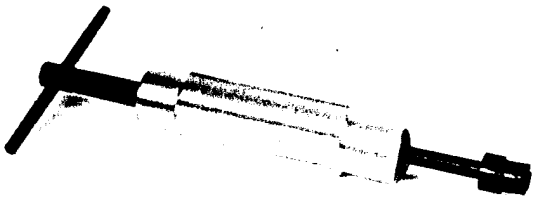
A356

0144-112
Flywheel Puller with Bolts
For all Arctic Cat engines.



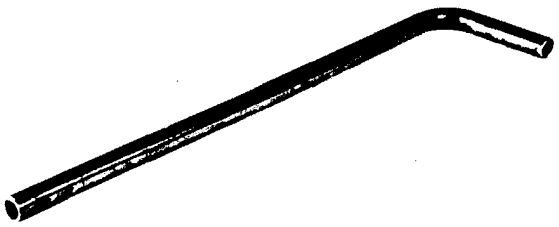
A361

0144-080
Bearing Puller Kit
For all Arctic Cat engines.



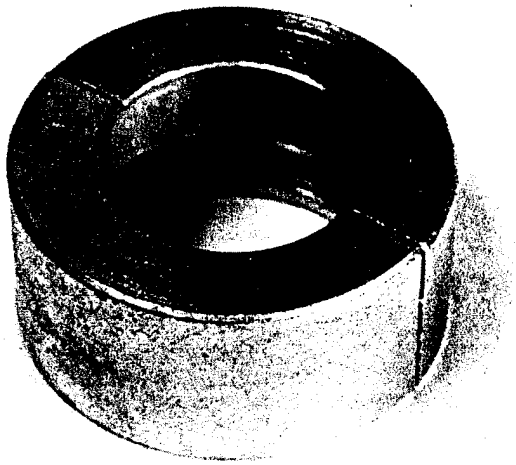
A359

0144-003
Piston Pin Extractor
For all Arctic engines.



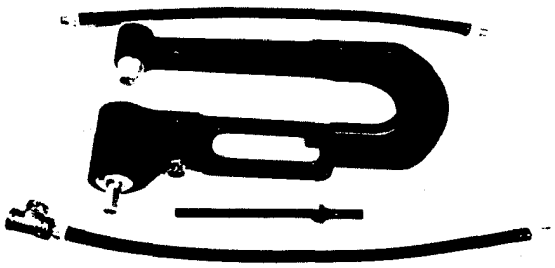
A483

0144-124
Suspension Spring Mounting Bar
For 1978 Pantera and El Tigre models.



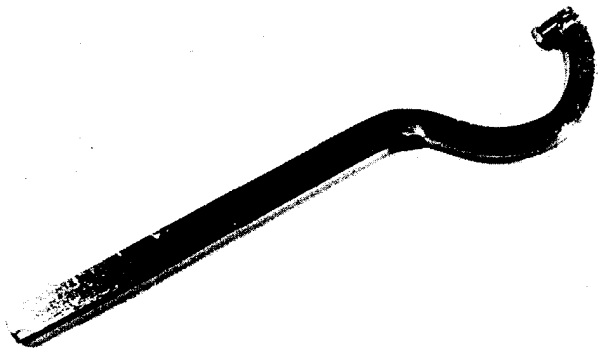
A362

0114-114
Bearing Puller Shells
For 2000 & 3000 Series Spirit engines.



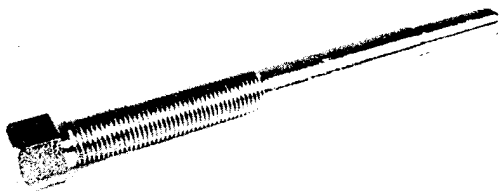
A386

0114-094
Solid Rivet Tool - Air Operated
For all Arctic Cat snowmobiles.



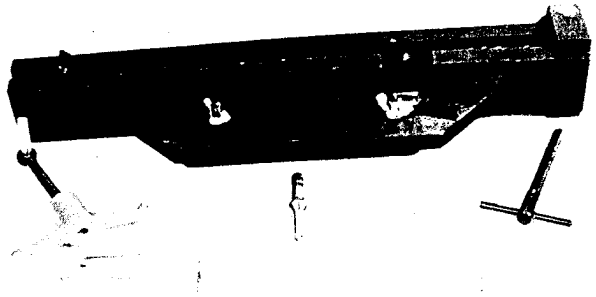
A352

)144-007
Flywheel Spanner Wrench
Use to hold flywheel on all Arctic Cat engines.



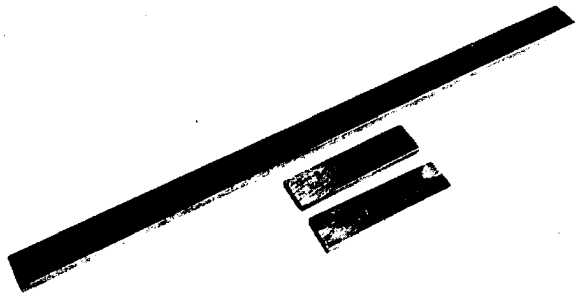
A377

0144-110
Arctic Drive Clutch Puller
For all 1976 through 1978 Arctic Cat snowmobiles.



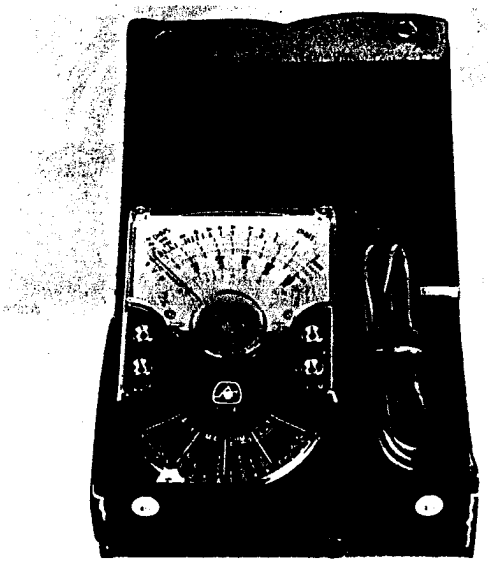
A384

0144-067
Solid Rivet Track Tool
For tracks with solid rivets and internal drive lugs.



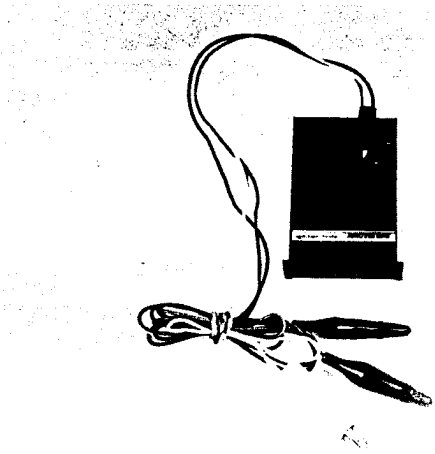
A388

0144-097 Spacer .305"
0144-098 Spacer .365"
0144-099 Bar, Clutch Alignment
Use on all Arctic Cat snowmobiles to check parallelism and offset between drive and driven clutches.



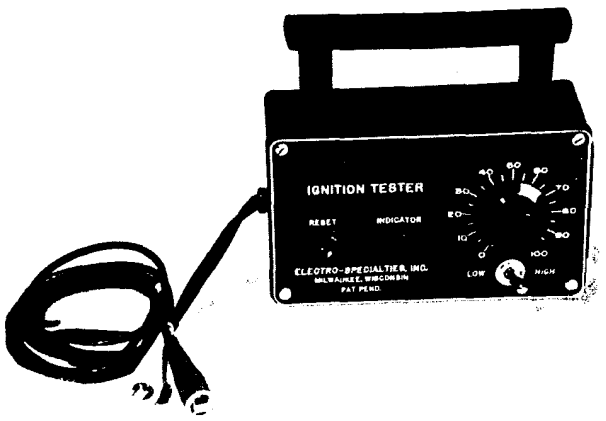
A373

0144-053
Multitester
Use to read AC, DC volts and ohms on all Arctic Cat Electrical Systems.



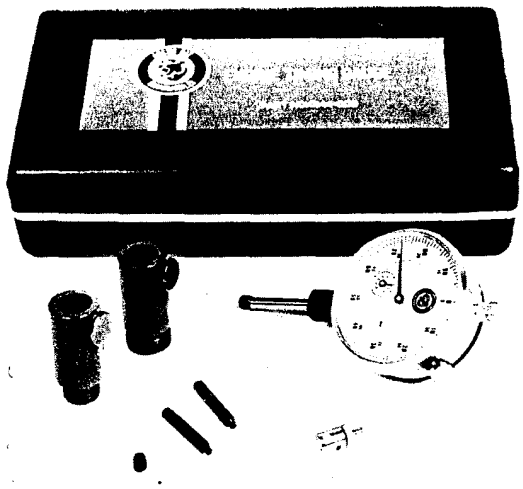
A374

0144-010
Timing Buzzer
For all Arctic Cat engines except those with CD Ignition.



A369

***CD Ignition Tester Model 1L**
For all Arctic Cat engines with CD ignition, including the Spirit engines.



A375

0144-009
Engine Timing Gauge
For all Arctic Cat engines except those with CD ignition.

*To order the electric tester, first contact the Service Manager at your distributor. If your distributor does not carry the tester, then order direct from:

Electro-Specialties, Inc.
11225 W. Bluemound Rd.
Wauwatosa, Wisconsin 53226

Ph. (414) 475-7550

Exact instructions for the use of electrical testers on the Arctic Cat snowmobiles are given in the Service Manual.

High Altitude Kit

High Altitude Kit

For maximum horsepower in elevations over 5000 feet, the high altitude kit should be installed. Each kit has been field tested to provide the best performance from each snowmobile.

Pantera FC 0136-115

Kit consists of:

Part No.	Qty.	Description
0146-108	6	Weights
6505-320	1	Jet Kit, 280 & 290

■ **NOTE: E-ring on Jet Needle in carburetor must be changed from fourth step to third step.**

Pantera FA 0136-044

Kit consists of:

Part No.	Qty.	Description
0146-106	6	Weights, 5.95 grams
6505-266	1	Jet Kit

Panther and Cheetah 5000 0136-106

Kit consists of:

Part No.	Qty.	Description
0146-105	6	Weights
6505-314	1	Jet Kit (260 & 270 Main Jets)
6505-215	1	Jet Needle (6DH7-2)

Panther 4000 0136-107

Kit consists of:

Part No.	Qty.	Description
0146-068	1	Spring
0146-105	6	Weights
0146-294	3	Ramp
0146-355	3	Roller/Brg. Assy.
6505-313	1	Jet Kit (240 & 250 Main Jets)

Jag 3000 0136-112

Kit consists of:

Part No.	Qty.	Description
0146-068	1	Spring, Compression 64 lb.
0146-106	6	Weights, 5.958 gm x .530 - Red
6505-316	1	Jet Kit Main - (180 & 190 Main Jets)

NOTE: E-ring on jet needle in carburetor must be changed from third step to second step.

Jag 2000 0136-113

Kit consists of:

Part No.	Qty.	Description
0146-175	6	Weights, 3.725 gm x .437 - Red
6505-315	1	Jet Kit Main - (160 & 170 Main Jets)

NOTE: E-ring on jet needle in carburetor must be changed from third step to second step.

Lynx T 0136-108

Kit consists of:

Part No.	Qty.	Description
0146-175	6	Weights
6505-269	1	Jet Kit (130 & 140 Main Jets)

NOTE: E-ring on jet needle in carburetor must be changed from third step to second step.

Lynx S 0136-109

Kit consists of:

Part No.	Qty.	Description
0146-068	1	Spring
0146-175	6	Weights
6505-312	1	Jet Kit (120 & 130 Main Jets)

NOTE: E-ring on jet needle in carburetor must be changed from third step to second step.

ARCTIC ENTERPRISES, INC.
THIEF RIVER FALLS, MINNESOTA 56701

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