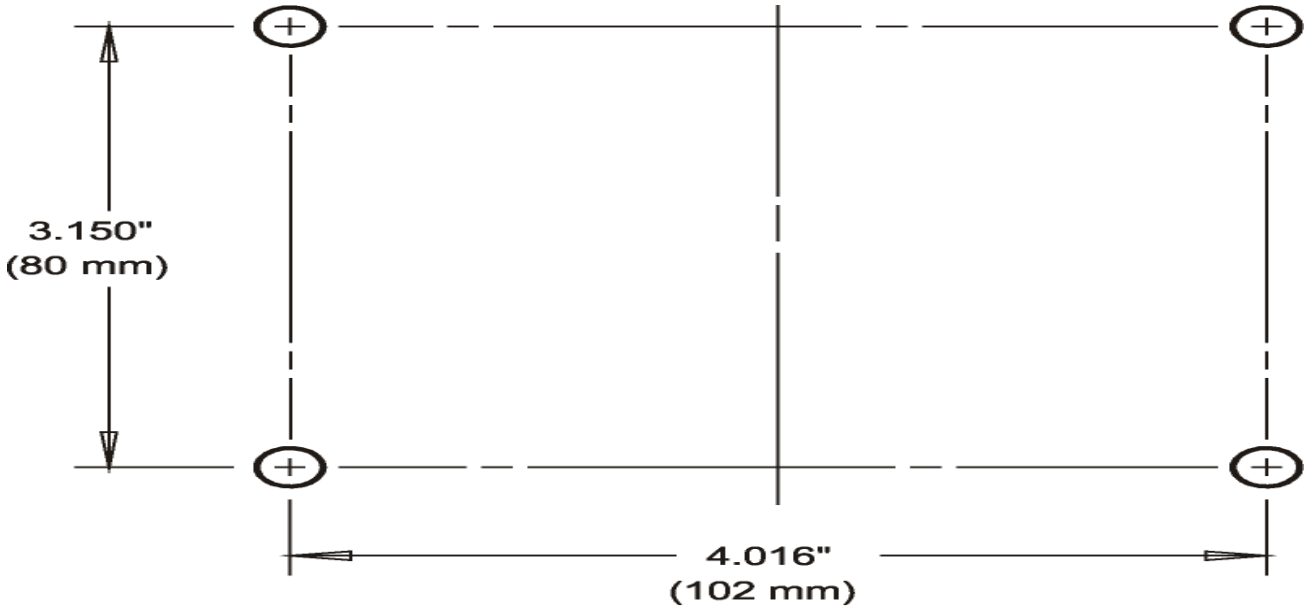
HPV100 Manual

2005

CONTENTS OF KIT

Each HPV100 engine is delivered with the following components:

Quantity	Description
1	Sparkplug cap
1	Sparkplug (NGK BR10EG)
1	Exhaust System
2	Exhaust springs
1	Carburetion phenolic spacer
1	Carburetor
1	Air filter cup
1	Clutch
1	Coil



Drill pattern for engine mount

The engine crankcase must be fixed to the mount with 4 Allen screws M8.

Torque at 22 ÷ 24 Nm. Make sure to engage a thread length of approx.18mm in the crankcase fixing holes (the screw should protrude 18mm from the mount).

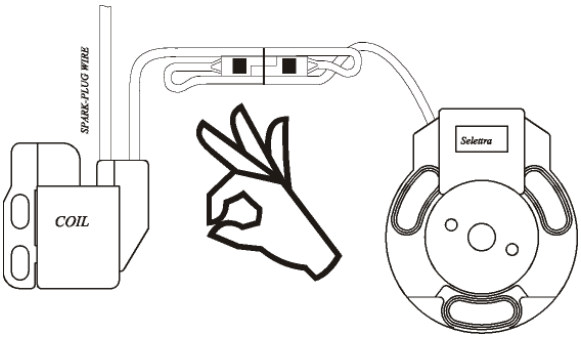
When installing the chain make sure that the engine sprocket and the axle sprocket are perfectly aligned, using a line up bar or straight edge.

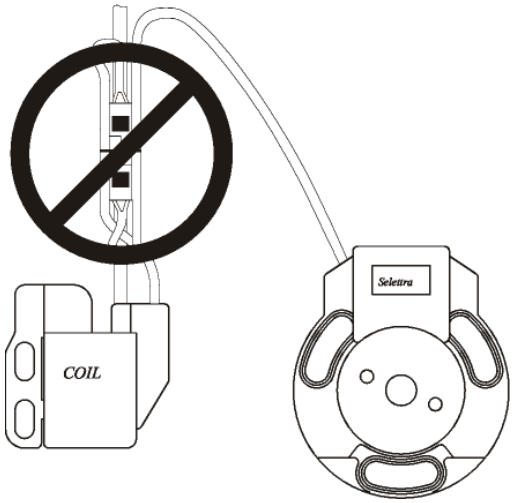
After fixing the engine to the chassis, check that the chain is properly tensioned. To do this, make sure that the chain play halfway between the engine and the axle sprockets is between 1/2” to 3/4”.

Every time before the engine is started, make sure to check the torque of the fixing screws on the mount and on the engine mount clamps.

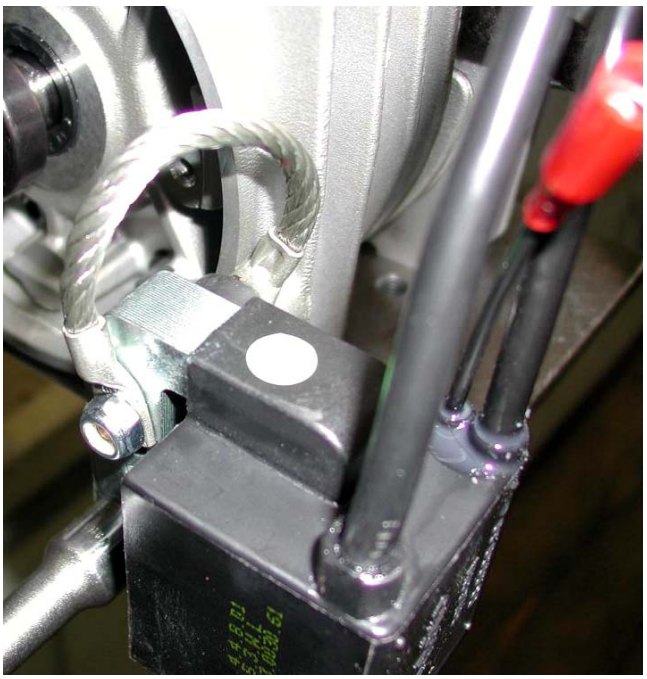
Warning! ***The 7mm diameter high voltage wire to the spark plug must never touch the oher coil wire(s) that connect to the magneto or kill switch. Reason, the high voltage can jump the circuit and burn out the coil.***

Correct installation ⇩





Always make sure to ground the coil. Failure install ground strap will cause the coil short circuit and be damaged beyond repair.



Warning!!!

Never attempt to shut off engine by pulling off the high tension spark plug wire as over 15,000 volts can severely injure or kill a human.
The red connector is for a kill switch…

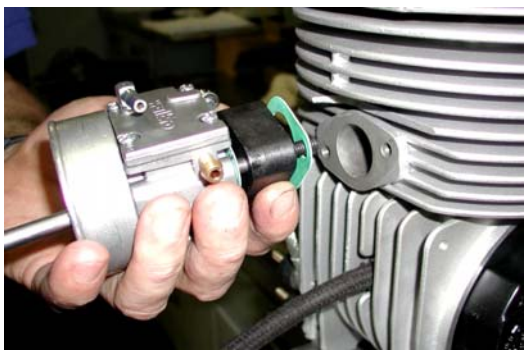
see photo. ⇒

How to install the carburetor

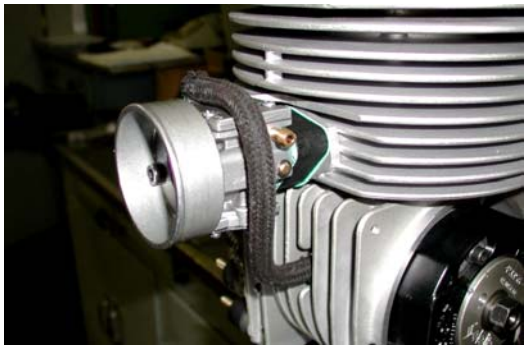
Install the parts in the following order:

- gasket
- plastic spacer
- gasket
- Walbro carburetor

Fix these parts altogether using 2 screws M6 x 75mm. Tighten at 6 ÷10 Nm



Connect the plastic tube between the pressure pulse on the carburetor and on the fitting on the crankcase →



← Connect the throttle cable to the carburetor and use a spring to improve the quick response of the carb throttle

Max RPM Range
HPV-1 13,200 – 13,800
HPV-2 13,800 – 14,400
HPV-3 14,400 – 15,000
HPV-4 14,800 – 15,500

Cylinder Head Temperature
300° F to 325° F HPV-1 cadet class
325° F to 360° F HPV-2, 3, & 4 classes

Fuel/Oil Mix

Use top quality 2 stroke racing oil like Horstman 2T blend of castor/synthetic. Mix 8 ounces oil per gallon of racing gasoline.
Many race events require spec fuel/oil mix therefore you must comply to compete. Do not allow any castor oil mix to stand for more than 6 hours. Use oils containing Castor Oil which guarantees an optimized lubrication at high temperatures. As on the other hand, use of Castor oils creates gummy residues which give origin to carbon deposits, it is necessary to check and clean, at least every 5 - 10 hours, the piston and the head.

Oils below are reliable blends:

- Horstman 2T .Torco GP7 or Maxima 2 stroke

Break-in Engine

A new engine or rebuilding with a new piston must go through a break-in period. (**See carburetor Break-in set up chart page 9**)

1. Adjust the carburetor dialing needles out for extra rich mixture
2. Run engine on track for 5-10 minutes with short spans of acceleration from half throttle to full throttle 2-3 second bursts. Never exceed 11,000 rpm and never keep rpm the same very long.
3. Do not allow engine temp to exceed 300° F during break in period
4. Return to pits and allow engine to cool down then check all nuts and bolts on kart and engine for tightness especially header nuts.
5. After several 5-10 minute track sessions and cool down periods the rings and piston will seat correctly.
6. Now you can go back onto the track and adjust the carb to a leaner mixture of fuel/air to gain power and speed.

SPARK PLUGS

Autolite AR51 *racing* is a good all round plug. Other brands are listed below

NGK			Bosch	Champion
BR 9	EG	hot	WO8 CS	N 54R
BR 10	EG	med	WO7 CS	N52R
BR 11	EG	cold	WO6 CS	

Clutch

This clutch is engineered for HPV100 Spec Class kart racing. Follow the instructions in this manual for maintenance. This clutch is a dry "direct drive" lock-up style with positive engagement at 5000 RPM.

Crankshaft Preparation

The taper on the crankshaft (See Fig. 1) must match the taper in the Clutch Drive Hub or the Clutch will not fit securely.

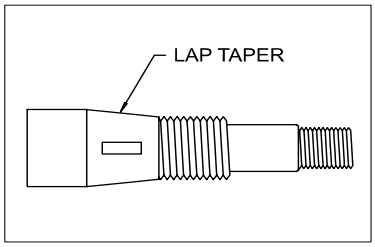


Fig. 1 Crankshaft

In order to check for proper fit, mark the crankshaft with an ink marking pen. Slide the Clutch Hub onto the crankshaft and turn slowly by hand 180 degrees. Remove the Clutch Hub and inspect the crankshaft. A good match is achieved when the ink is wiped off the entire length of the taper after you have rotated the Clutch Hub. If a bad match occurs, lap the Hub and the crankshaft with fine lapping compound. Clean off the lapping compound before installation.

Installation To HPV100 Engine

1. Insert Woodruff Key into crankshaft.
2. Slide clutch Drive Hub assembly onto taper of crankshaft. Be sure the keyway in the Drive Hub is aligned with the Woodruff Key.
3. Install Coned Safety Washer (item 7), Jam Nut (item 6) and tighten until Coned Safety Washer is flat. (450 in. lbs.)
4. Install the Internal Thrust Washer (item 5). Due to manufacturing tolerances, three sizes of the Internal Thrust Washer are provided with each Clutch. It is important to install the washer that provides proper clearance to allow the drum to spin free after the Starter Nut (item 1) is tight. (See fig. 2) Note: Chamfered side of washer faces engine.
5. Apply lithium grease to the Roller Bearing (item 3) before installing the Drum.
6. Install the Drum with Bearing onto the crankshaft.
7. Install the External Thrust Washer (item 2). Note: Chamfered side of washer faces engine.
8. Thread on the Starter Nut (item 1) and tighten to 300 in. lbs. Optional Spanner Wrench (P/N 99-5139) is designed to prevent the crankshaft from turning while tightening the Starter Nut.

End Play (See Fig. 2)

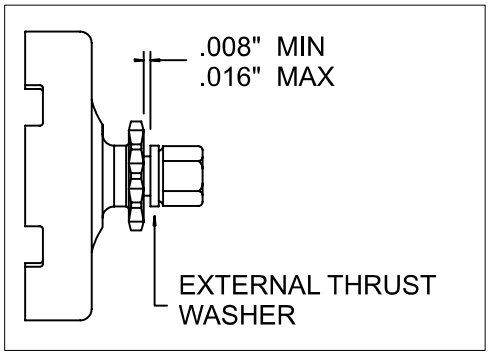


Fig. 2 End Play

End Play is important to allow Drum to spin free. Check end play with feeler gage after Starter Nut is tightened. Too little clearance will cause binding while too much will cause chain alignment problems. Optional internal washers are available to obtain proper tolerance. Min. .008” Max .016”

Starting Engine & Entering Track

The Clutch is designed to permit easy starting with a battery operated Gun Starter. The Gun Starter should have a 5/16" hex drive.
When starting the engine be sure to keep the brake engaged in order to prevent any sudden acceleration. When the engine starts, the clutch will be in neutral until the engine reaches approximately 4000 RPM. At about 4000 RPM the clutch will start to engage and the kart will start to move. Since the Clutch engages at a low RPM, driving technique will be the same as a direct drive vehicle. This reduces clutch wear for less maintenance cost.

Stall Speed

Stall speed is the RPM the clutch locks up solid. Spec stall speed maximum is 5000 RPM. For tech the minimum spring adjustment height is .236" and there is no maximum height however do not exceed .260". Use locktite on the retainers to prevent them from working loose. Fig 3

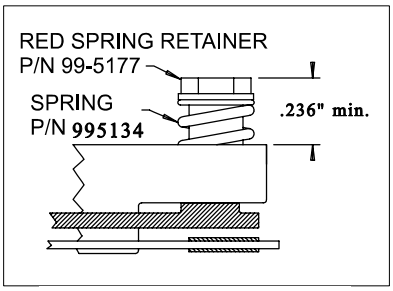


Figure 3

Clutch Removal

1. Remove the Starter Nut (item 1). Note: Clutch Spanner (P/N 99-5139) is designed to fit around the Drive Hub (item 12) to prevent the crankshaft from turning when loosening nut.
2. .Remove the External Thrust Washer (item 2), Drum (item 4), Roller Bearing (item 3) and Internal Thrust Washer (item 5). If bearing is hard to remove it is helpful to file or sand the burr of the crankshaft edge.
3. Remove Jam Nut (item 6) & Coned Safety Washer (item 7) Nut is normal RH thread
4. Remove the Clutch Drive Hub (item 12) using an optional Clutch Puller (P/N 99-5140

Maintenance and Repair

Due to the extreme demands of Racing it is important to properly maintain your Clutch in order to obtain maximum performance.

1. **Roller Bearing Item 3**
Since the EXPD-A Clutch is a dry clutch, there is no oil supply for the bearing. It is necessary to apply lubricant to the bearing in order to prevent extreme wear or seizure to the crankshaft. Lithium grease works best. Apply grease or spray Tri-flow into bearing before each track session.

2. **Sprocket / Drum Assembly Item 4**
Oiling the chain before each track session will increase the life of the sprocket. A worn or chipped chain should be replaced as it will quickly wear out the sprocket. The drum should be replaced when the teeth are worn to a sharp point. Note: Use chain oil … Tri-flow is not chain oil

3. **Friction Disc Item 10** ***tech item***
The Friction Disc has a steel core with ceramic friction material bonded to the surface. It should be inspected after four hours of use. Replace if lugs are worn or cracked or if lining is worn below .122" thick.

4. **Springs Item 13** p/n 995134 *tech item*
The springs are made from stainless steel. They will last many hours and only need to be replaced when broken or collapsed below .465" free length. **Warning: New springs must not exceed .505" free length and max. wire dia. .065"**

5. **Pressure Plate Item 11** ***tech item***
The Pressure Plate is precision ground on the surface that engages the friction disc. This surface should be checked periodically for warp and or wear. Replace when badly warped or worn or studs loose. Minimum thickness .150"

6. **Drive Hub Item 12** *tech item*

Remove the Levers (item 16) from the Drive Hub, check for wear in the slotted area after 10 hours running time. Badly worn slots will cause poor performance. Tech item max width .700" x .670"min. also width at lever contact area max . 380" min .370"

7. **Fixed Plate Item 9** *tech item*

Replace when worn below .125" or badly glazed

8. **Levers Item 16**

The pivot hole in the lever is subject to a stress due to frictional loading from centrifugal force. This causes the pivot hole to eventually elongate. Inspect the levers for pivot hole wear or flat spots whenever you rebuild the clutch.

9. **Dowel pins item 15**

The Dowel Pins must absorb high stress from the levers. Replace after 10 hours of use to avoid breakage.

10. **Thrust Washers and Nuts**

Visually inspect during teardown and replace if cracked or damaged. Apply grease to washers every race event.

Clutch Assembly

1. **Clean parts with disc brake cleaner or WD-40. Disc brake cleaner comes in an aerosol spray can and is available at most automotive parts stores. Do not use gasoline or solvents to clean the Clutch!**
2. **Apply anti-seize or grease to the Dowel Pins (item 15). Slide Dowel Pins into the Levers (item 16). Groups of 3.**
3. **Insert Pressure Plate (item 11) into the Drive Hub (item 12).**
4. **Place each Spring (item 13) over a corresponding Pressure Plate Stud. Next, screw the Red Retainer (item 14) onto each Stud until the desired height of .246" is obtained. (See Fig. 4)**
5. **Lay the Friction Disc (item 10) onto the flat side of the Pressure Plate.**
6. **Place the Fixed Plate (item 9) over the Drive Hub and align the 3 holes in the Fixed Plate with the Drive Hub Holes.**
7. **Apply anti-seize to Screws (item 8) and insert into the bolt holes in the Hub (item 12). Tighten screws to 50 in. lbs. Note: These screws should not be tightened past 50 in. lbs. or they will be difficult to remove.**
8. **Clutch is ready for installation on crankshaft.**

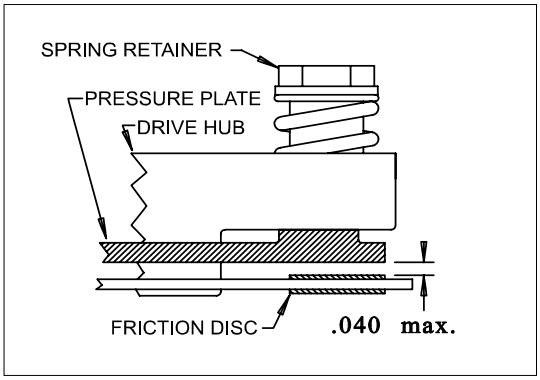
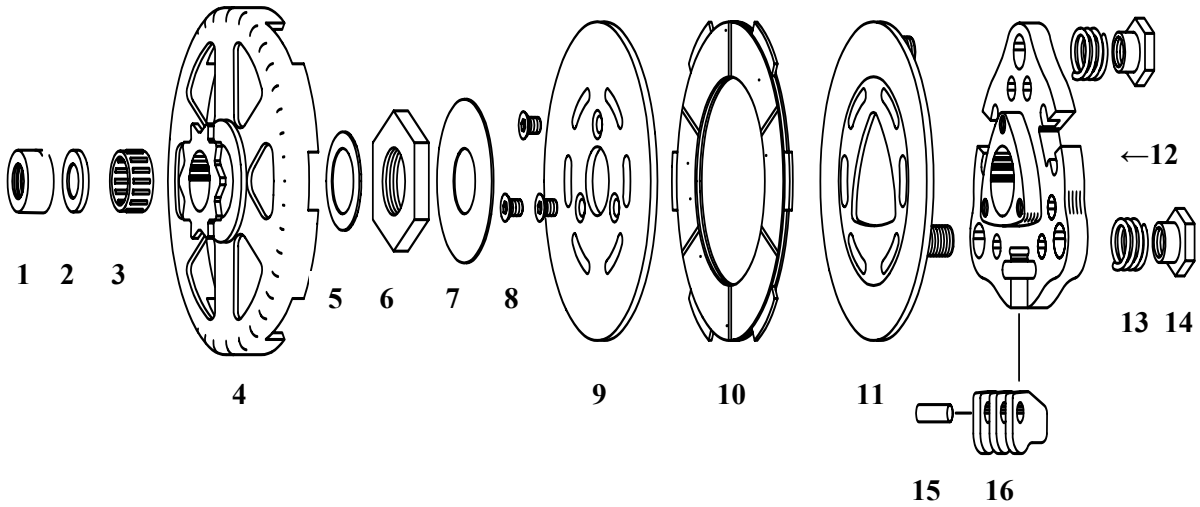


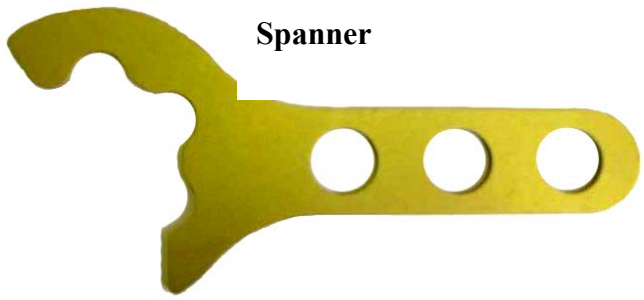
Figure 4

Air Gap

Air Gap is a tech item....Air Gap is the clearance necessary for proper clutch engagement and disengagement. Permitted Air Gap maximum is .040". To check Air Gap measure space between fixed plate and pressure plate then subtract the friction disc thickness. When Air Gap exceeds .040" install a new Friction Disc (See Fig. 4)

Item Number	Part Number	Description	Units Required
	995153	EXPD II Clutch for HPV100 complete 10T	
	995154	EXPD II Clutch for HPV100 complete 11T	
1	995175	Starter nut M10x1	1
2	995121	Thrust washer, external	1
3	995123	Bearing	1
4	995166	Drum 10T 219 with bearing	optional
	995167	Drum 11T 219 with bearing	1l
5	995124	Thrust washer 1.5mm	optional
	995125	Thrust washer 1.7mm	1
	995126	Thrust washer 1.8mm	optional
6	995127	Jam Nut M16x1	1
7	995128	Coned washer	1
8	995129	Screw M5x10 Flat head	3
9	995130	Fixed plate	1
10	995131	Friction disc	1
11	995146	Pressure Plate	1
12	995136	Drive hub	1
13	995134	Spring	3
14	995177	Retainer	3
15	995137	Dowel pin	3
16	995138	Lever	9
	995139	Spanner	optional
	995176	Puller tool	optional

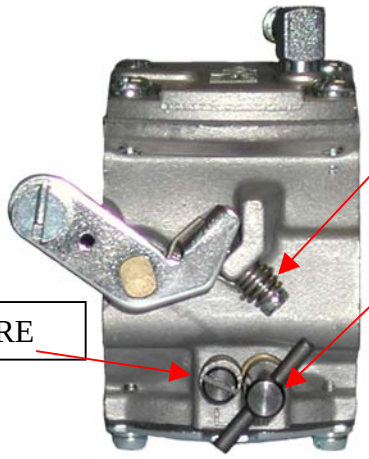




Spanner

Puller

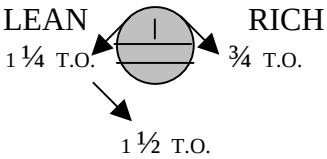
WB-3A CARBURETOR MIXTURE SCREWS ADJUSTMENT GUIDE



(I) IDLE SPEED SCREW

(H) HIGH SPEED FUEL MIXTURE

(L) LOW SPEED FUEL MIXTURE



T.O. = TURNS OPEN

Normally the correct **break-in** setting of the mixture screws is the following:

- 1 1/2 T.O. for the L (close the screws completely and then open)
- 3/4 T.O. for the H (close the screws completely and then open)

ATTENTION:

- NEVER LEAN TOO MUCH AS LEAN MIXTURE WILL OVERHEAT ENGINE AND CAUSE SEIZURE.
- DO NOT FORCE H OR L CLOSED. IT MAY DAMAGE THE PRECISION MACHINED ORIFICE AND RENDER THE CARB. UNSERVICEABLE.
- THE ADJUSTMENT OF SCREWS MUST BE PERFORMED WITH WARM ENGINE.

(High) — Adjust ¾ T.O. from closed

(Low) — Adjust 1 1/2 T.O. from closed

(Idle) — Close ½ T.O. after contact with throttle lever

Start engine and warm it if R.P.M. too high adjust **I** counterclockwise until clutch is disengaged.

Slowly adjust clockwise

If R.P.M. decreases → Turn c.c.w. until max. R.P.M. is reached adjust further fractionally for rich idle. Trigger accelerator.

If R.P.M. increases → Continue to turn clockwise until max. R.P.M. is reached, adjust fractionally c.c.w. for rich idle. Trigger accelerator.

Engine is now idling at max. attainable R.P.M. or slightly lower on rich side.

Adjust **I** counterclockwise until recommended R.P.M. is reached EG-3000

Recheck **L** screw for optimum setting required.

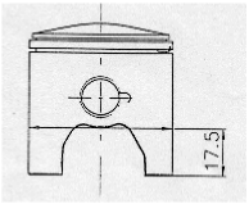
Adjust **H** until required height free speed is reached. Turn clockwise for higher R.P.M. counterclockwise for lower R.P.M.

Return to idle and check acceleration for quick response and smooth pick-up.

Bad acceleration → Adjust **L** slightly richer by ⅛ T.O.

Good acceleration → Engine ready to operate

Matching Piston



ATTENTION : Play between piston and liner must be .090 mm (.0035") If play exceeds .011 mm replace piston. Pistons are measured at 17.5 mm from bottom of piston and size measured must be 0.090 mm lower than what is stamped on piston top.

- Green Dot: size of liner is as marked on piston top.
- Red Dot: add 0.01 mm to size of liner marked on piston top.

Ring end gap .008" min to .015" max .203mm min to .381mm max

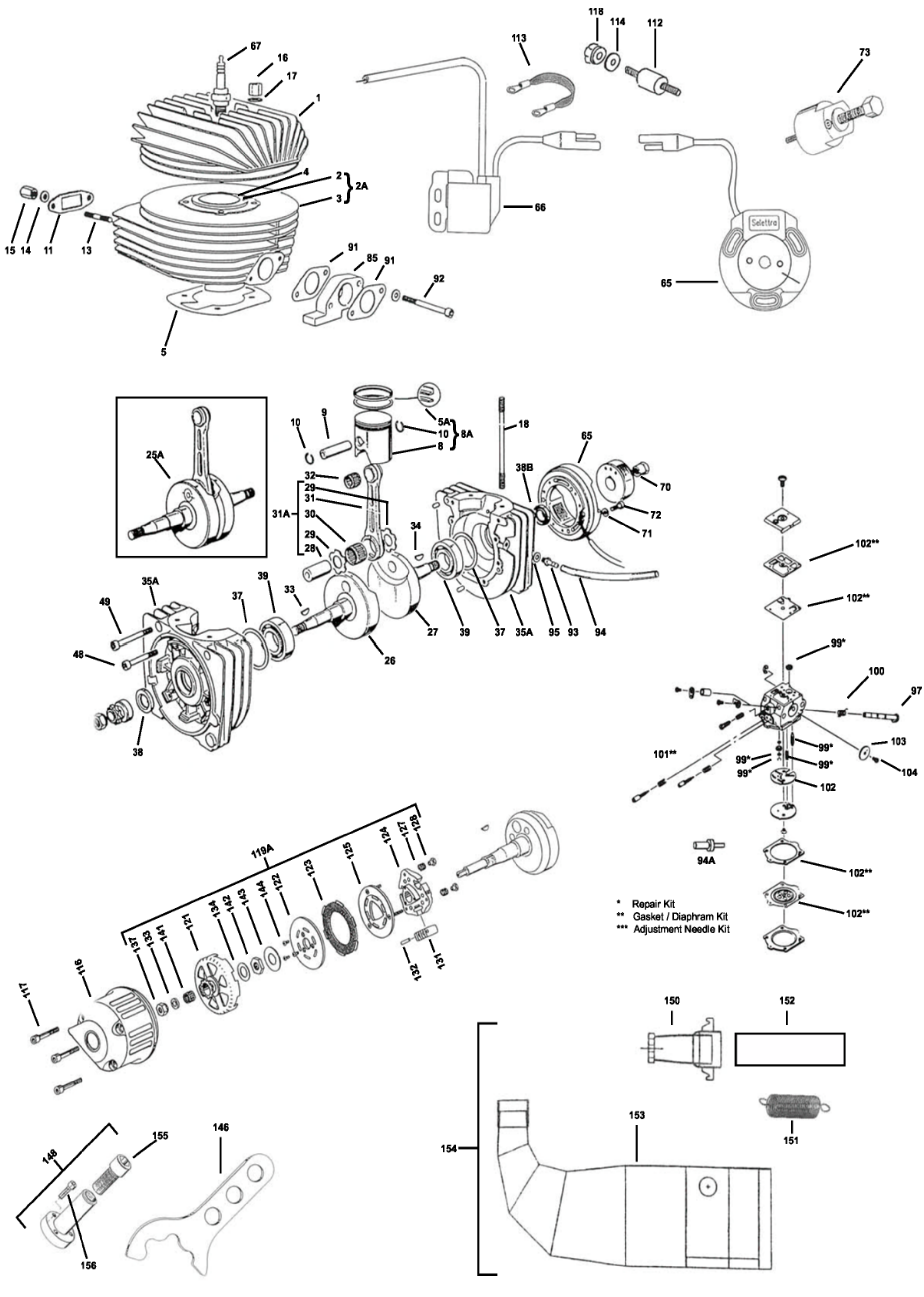
Maintenance Service should be performed by skilled craftsman

1. Crankshaft Check status of crank halves ... replace when worn at bearing seat beyond 0.03mm
2. Crankpin Visually inspect and replace is scored or worn where it contacts big end bearing
3. Conrod Check top and bottom bearing bores ... replace rod when ovalization exceeds 0.01mm
4. Rollar cages Replace every 4 hours
5. Crankcase bearings Replace every 5 hours
6. Seals Replace every 4 hours
7. Piston Replace every 10 race events Make sure arrow faces exhaust
8. Piston pin Replace when using new piston
9. Cylinder head clean carbon buildup from combustion chamber ...do not scratch chamber Torque nuts with cross pattern to 1.8 kgm
10. Exhaust System check after each race for cracks or dents to all components ... replace as needed ... excessive carbon buildup can affect performance ... for best performance install a new exhaust chamber yearly. Spray outside of exhaust chamber each night after racing with WD-40 to reduce corrosion ... wait until pipe is cool to prevent possible flame Replace gasket every time header is removed torque exhaust nuts to 1 kg

Ignition Timing .080" to .100" B.T.D.C.
excessive advance above .100" may cause pre-ignition and piston damage

1. Install a dial indicator with adapter to spark plug threads in head
2. Rotate crankshaft until piston is at T.D.C.
3. Set gauge a Zero
4. Looking at ignition , turn rotor clockwise by 2.2mm Hold rotor to prevent turning
5. Rotate stator until the marks on rotor and stator line up
6. Tighten screws on stator

Break-in Carburetor Setup Chart			
Class	**Carb Model**	**Approximate Settings**	**Popoff**
HPV-1 IKF Cadet / WKA Jr Sportsman	**HPV-1**	**1 1/4 Low 1 1/4 High**	**20 lbs**
HPV-2 IKF Jr / WKA Jr	**WB-3A**	**1 1/2 Low 3/4 High**	**10 lbs**
HPV-3 IKF Senior / WKA Senior	**WB-3A**	**1 1/2 Low 3/4 High**	**10 lbs**
HPV-4 IKF Senior / Outlaw Piston Port	**WB-3A**	**1 1/2 Low 3/4 High**	**10 lbs**
HPV-5 KART Roadrace	**WB-3A**	**1 1/2Low 3/4 High**	**10 lbs**


67
16
17
1
4
2
2A
3
15
14
11
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91
85
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92
5
113
118
114
112
66
65
73
25A
10
9
5A
10
8A
8
32
29
31
31A
30
29
28
34
18
38B
65
70
72
71
35A
49
48
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39
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35A
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102**
102**
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101**
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99*
103
104
102
94A
102**
102**
* Repair Kit
** Gasket / Diaphram Kit
*** Adjustment Needle Kit
119A
137
133
141
121
134
142
143
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122
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HPV-100 Parts

0	992100	Engine Less Carb, HPV 100
	992101	Engine Kit 7hp Cadet, 8-11
	992102	Engine Kit 11hp Jr., 12-15
	992103	Spec Engine Kit 14hp Sr.
	992104	Spec Engine Kit 18hp Sr.
	992106	IKF Jr. Spec Engine Kit
1	992124	Cylinder Head HPV-100
2A	992126	Cylinder HPV-100/K71
4	992219	Head Gasket .005"
	992220	Head Gasket .010"
5	992127	Gasket .016" Cyl. Base
	992128	Gasket .008" Cyl. Base
	992129	Gasket .005" Cyl. Base
5A	992130	Piston Ring Set 52.43
	992131	Piston Ring Set 52.53
	992132	Piston Ring Set 52.63
	992133	Piston Ring Set 52.73
	992134	Piston Ring Set 52.83
	992135	Piston Ring Set 52.90
8A	992136	Piston w/rings 52.4r
	992137	Piston w/rings 52.4g
	992138	Piston w/rings 52.42r
	992139	Piston w/rings 52.42g
	992140	Piston w/rings 52.45r
	992141	Piston w/rings 52.45g
	992142	Piston w/rings 52.5r
	992143	Piston w/rings 52.5g
	992144	Piston w/rings 52.52r
	992145	Piston w/rings 52.52g
	992146	Piston w/rings 52.55r
	992147	Piston w/rings 52.55g
	992148	Piston w/rings 52.6r
	992149	Piston w/rings 52.6g
	992150	Piston w/rings 52.62r
	992151	Piston w/rings 52.62g
	992152	Piston w/rings 52.65r
	992153	Piston w/rings 52.65g
	992154	Piston w/rings 52.7r
	992155	Piston w/rings 52.7g
	992156	Piston w/rings 52.72r
	992157	Piston w/rings 52.72g
	992158	Piston w/rings 52.75r
	992159	Piston w/rings 52.75g
	992160	Piston w/rings 52.8r
	992161	Piston w/rings 52.8g
	992162	Piston w/rings 52.82r
	992163	Piston w/rings 52.82g
	992164	Piston w/rings 52.85r
	992165	Piston w/rings 52.85g
	992166	Piston w/rings 52.9r
	992167	Piston w/rings 52.9g
9	992168	Piston Pin Sel. 2
10	992171	Circlip
11	992172	Gasket, Exhaust Pipe
13	992173	Stud, Exhaust
14	992174	Washer, Flat
15	992175	Exhaust Nut 8mm
16	992176	Head Nut
17	992177	Washer, Head Nut
18	992178	Stud, Cylinder
25A	992180	Crankshaft Assy HPV-100
	992182	Crankhalf PTO HPV-100
27	992183	Crankhalf Ign. HPV-100
28	992184	Crankpin 43mm
29	992185	Washer, Bronze
30	992186	Big End Cage 15r
31	992187	Con Rod Only
31A	992188	Con Rod Assy
32	992189	Small End Cage
33	992190	PTO Shaft Key
34	992191	Mag Shaft Key
35A	992193	Crankcase Assy HPV-100
37	992217	Shim 0.1mm
	992218	Shim 0.15mm
38	992194	Oil Seal 20x32x7 HPV-100
38B	992196	Oil Seal 17x32x7 HPV-100
39	992197	Bearing 6205-C4
48	992198	Screw 6x60
49	992199	Screw 6x40
65	992201	Ignition, Less Coil Selettra
66	992202	Coil, Selettra
68	992216	Spark Cap
70	992200	Nut, Magneto
71	992203	Flat Washer M5
72	992204	Screw M5
73	992328	Rotor Puller, Selettra
74	992327	Rotor Wrench, Selettra
85	992205	Carb Spacer WB3A
	992305	Carb Spacer HPV1
86	992321	Manifold HPV1
87	992307	Screw Manif/Cyl. HPV1
88	992309	Screw Carb/Manif HPV1
89	992308	Gasket Carb/Manif HPV1
91	992206	Gasket Carb/Spacer WB3A
92	992207	Screw M6x70 WB3A
93	992208	Pulse Fitting WB3A Carb
	992318	Pulse Fitting HPV1
94	992322	Pulse Tubing WB3A Carb
	992319	Pulse Tubing HPV1 Carb
94A	992317	Reducer, Fuel Line HPV1
95	992209	Pulse Fitting Gasket, Universal
96	992301	Carburetor HPV-1
	992310	Carburetor WB3A
	992299	Throttle Arm, Cable Anchor
97	992300	Throttle Shaft HPV-1
98	992320	Filter Cup HPV-1
	992323	Filter Cup WB3A
99	992324	Repair Kit HPV-1 Carb
100	992334	Spring, throttle HPV-1 Carb
101	992329	Adjustment, Needle Kit HPV-1
102	992315	Gasket, Carb HPV-1
103	992316	Throttle Shutter, HPV-1
104	992336	Screw, Throttle Shutter, HPV-1
105A	992210	Gasket Set
112	992211	Dampener, Coil
113	992212	Ground Cable, Coil
115	992213	Nut M6
116	992214	Clutch Guard
117	992215	Screw M6x55
118	992225	Nut
119A	995150	Clutch, EXPD-A 9T35 HPV-100
	995151	Clutch, EXPD-A 10T35 HPV-100
	995152	Clutch, EXPD-A 11T35 HPV-100
	995153	Clutch, EXPD-A 10T219 HPV-100
	995154	Clutch, EXPD-A 11T219 HPV-100
	995155	Clutch, EXPD-A 12T219 HPV-100
121	995163	Drum w/brg 9T#35 chain
	995164	Drum w/brg 10T#35
	995165	Drum w/brg 11T#35
	995166	Drum w/Brg 10T#219 chain
	995167	Drum w/Brg 11T#219
	995168	Drum w/Brg 12T#219
	995190	Drum w/Brg 15T#219
	995169	Drum w/Brg 16T 8mm Htd Belt
	995188	Drum w/Brg 17T 8mm Htd Belt
	995189	Drum w/Brg 19T 8mm Htd Belt
122	995130	Fixed Plate
123	995131	Friction Disc
124	995136	Drive Hub HPV-100
125	995146	Pressure Plate
127	995134	Spring
128	995177	Retainer, Red Color
131	995138	Lever, Solid, EXPD-A
132	995137	Dowel Pin, EXPD-A
133	995121	External Thrust Washer
134	995124	Internal Thrust Washer .060"
	995125	Internal Thrust Washer .065"
	995126	Internal Thrust Washer .070"
137	995175	Starter Nut HPV-100
141	995123	Roller Bearing
142	995127	Jam Nut HPV-100
143	995128	Cone Washer HPV-100
144	995129	Screw, M5x10
146	995139	Spanner Wrench
148	995176	Puller, Clutch
150	995260	Header
151	995265	Springs, Pair
152	995266	Flex Tube HPV-1, HPV-2, HPV-3
	995268	Flex Tube HPV-4
153	995271	Exhaust Chamber HPV-1
	995272	Exhaust Chamber HPV-2
	995273	Exhaust Chamber HPV-3
	995274	Exhaust Chamber HPV-4
	995280	Exhaust Chamber HPV-Pro
154	995261	Exhaust System HPV-1
	995262	Exhaust System HPV-2
	995263	Exhaust System HPV-3
	995264	Exhaust System HPV-4
	995283	Exhaust System HPV-Pro
155	995178	Center Bolt Puller
156	995179	Bolt, Puller
157	995277	**End Cap**. Fits HPV 1,2 & 3 pipes