

KWIK SHOP

GENERAL PREDATOR RULES 2024

- These rules are intended to keep the engine as Stock Out Of The Box As Possible. There are no gray areas. If they do not specifically state that something is allowed, it will automatically be illegal. All parts must be Factory Predator parts.
- Harbor Freight Engines Only: 212CC Engines only: Models: 69730 and 60363 only.
- Should any parts that are in question arise that are not clearly addressed in these rules, it is the duty of the racer to obtain clearance from Local Tech Inspector prior to entering the class. If in the opinion of the LTI the intent of the modification was a performance gain, the racer will be DQ'd from all classes entered that night.
- Officially the Spirit and Intent discretion will override all rules mentioned below. If there is not a measurement given below, It Must Remain Stock. If it does not say below you can add or take off or modify, it must remain Stock.
- All OEM casting marks must be visible. All OEM Factory Stampings must be visible at time of inspection, NO TUMBLING OR POLISHING OR DEBURRING.
- No interchanging parts from different Serial # or generation groups of engines.
- Local track reserves the right to swap any part/Complete engine off the engine being raced with a known OEM part/complete engine.
- Track has option of updating the rules if any parts are found to be OEM updates that are not covered in this manual, anytime during season.
- (OPTIONAL) Original Fuel tank cap must be completely sealed. Drilled 1/8 hole allowed in cap to vent, fuel pick up tube must be in stock location. Fuel line must remain ¼" id.
- Fuel pump can only be pulsed off of valve cover, Not side cover. Approved fuel pump only.
- Blower housing OEM. Pull start must be in original location at end of race. **Vertical Face of Pull Start can be taped or a sticker applied. Angled vent holes must remain exposed.**
- Stock air box. Air can only enter carb through OEM filter. Must pass combustible spray test. Air can only enter air box from 4 square holes at bottom and end of stock air box. No adding or removing material.
- HEADER: Pipe can be wrapped but not muffler. 10-15" long .685 max id nipple. .750 od pipe max. RLV B-91 mini only Part#4117 5.470-5.600. **MUFFLER IS MANDATORY.** MUST be able to unscrew from pipe to measure inside baffles. Muffler must be completely tight against pipe and braced. No sealer permitted. Must meet height rules of 14.5" to surface. Aftermarket studs are allowed for clearance of Doubled Nuts, safety wired coupling nuts allowed. Flange: .500 flange (MAX) allowed. Muffler must be connected to pipe at completion of race. Broken pipe (2pcs), not connected by bracing warrants DQ(Safety) from that class.
- **SPRINGS and RETAINERS:** **Springs will not be flipped to pass dead weight check.**
- Height cannot be more than .040 difference at any location from a confirmed starting point. Must pass ¼" coil bind check on one side of block. Max OD of .800 Must Pass Track's 10.8 and 18# check. .071 Max Wire Diameter.

Max 4 coils. Length will be compared to known stock spring. Maximum Length: 1.280". Springs must be made of a magnetic material. Spring must slide freely over post and make contact with base of tester.

- Retainers: Must be OEM for Series of Engine raced. Must be Magnetic
- Spring Pocket cannot be altered.
- TIMING: 15 degrees (-5 +1)
- Ignition: 11 ohms max and must show a reading. Resistor must be present and functional.
- CC 28 must stay in Plug
- VALVE TRAIN: No sealer allowed on valve cover. Stock angle on valves with dish only, OEM. Stock material only.
- OEM GASKET MATERIAL ONLY/No Copper No aluminum. Minimum .009"
- Do Not Sink Valves.
- No Sealer on Crankcase Cover
- BEARINGS: Steel Balls only (9) No ceramic bearings. Balls, race and housing must be magnetic.
- **CARBURETOR**: No Sealer allowed on complete carb assembly.
- HUAYI or RUI*ING or SP. There must be a factory edge, not rounded or smoothed over, all the way around the entrance and exit to the venturi of carburetor. No extra holes drilled in carburetor anywhere. Choke assembly must be in place and functional. Venturi .608" Must-Go. .615" NO GO Bore. Throttle bore .751" No-Go. Minimum Protrusion into venturi Huayi: .488 SP,Ruixing: .478 E Tube: Minimum length is 1.092". Hole diameter must be 0.036" No-Go. Bottom holes can be either 2 or 4 holes. The minimum diameter is 0.154".Phenolic Plate: Inside Hole .066 NO GO (Cannot Enter Either Side) Bolt holes stock **No altering finish. No altering Bore finish or shape. Fuel bleed off slot must be unaltered.** Thickness must be maintained at .257" minimum. Plate must be flat and maintain consistent thickness at all points. Gaskets: Only one gasket is allowed between the carburetor and phenolic spacer, and if a restrictor plate is used a total of two gaskets are permitted.
- Low Speed Hole In Carb. .092 no go
- Hole in LOW Speed Jet Holder: .103 NO GO
- LOW Speed Jet: .021 No GO/Both O Rings in stock location. Bottom Oring cannot enter .265 No Go Hole
- MAIN Jet .031 NO GO Length .340(+-.005) Must Be Tight against E Tube
- 245 No Go @ .610 depth in casted Low Speed Jet holder on carb
- Pick up Hole @ Main Jet .091 NO GO
- Hole @ Float Seat .061 NO GO
- Holes behind welch plug on low speed side exit .024 max
- Throttle Shaft .115 min @ butterfly .231 shaft min. (NO REAR OFFSET)
- Butterfly: Part# on right side/Must be present. 037 min thickness.
- Screw in Butterfly shaft .274 minimum length

- CLUTCH: 16 Tooth Steel Drum with centrifugal shoe type
- TIRES: Maxxis HT 3 Slicks Only WHEELS: 10" Maximum
- No Skip Tooth gears allowed on any part of drive train
- 57, 58, 59 gear only. No Mini Gear Hubs or Gears
- 33.75"-34.5" circumference on Right Rear.

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- No Shims or seals under Valve Springs. Mechanical Seals may be removed
- HEAD: Gasket surface to area between valve seats .415 minimum. Sealer Allowed on gasket area. .891 no go on X seat, .971 no go on Intake seat. 68 mm chamber minimum. Depth of bowl on both ports .9375
- VALVES: 2.520 long .214 diameter stem. Intake .986 .055 dish Exhaust 1.064 .071 dish. 24 GRAMS
- RETAINERS: Lash Caps on Intake and Exhaust retainers. Retainer 6 grams
- ROCKER PIN= 1.025 length, .314 dia.
- Valve guides= .216 max id, 1.090 min length on X, and 1.220 min. length on I
- PUSH ROD= 5.550" oal .157 diameter .194 Ball Diameter 13.9 Grams (Stock)
- Rocker Arm Length 1.850". No grinding

CAM : .550 Journal Compression Relief must be fully functional. Metal Cores Only

VALVE LIFT: .245 based off 1:1 ratio on Max Lift for individual lobes.

INTAKE: 225-227 Lift on Push Rod

EXHAUST: 225-227 Lift on Push Rod

DURATION: Intake and Exhaust @ .050 = 209 Degrees. Minimum @ .050 = 206 Degrees

- Piston to remain in block minimum .020. Lip on block must be visible.
- Bore: 2.756 max
- Stroke: 2.161 max (-.005}
- Lifters: .922 HEAD .314 STEM 1.368 OAL 19.8 GRAMS
- Flywheel: OEM, Must weigh 5.100 lbs. Flywheel fins must be plastic and original length and shape. No offset keys allowed. No grinding of keys . Stock key must be present.
- Rod: 2.365 long .710 ID
- Wrist Pin 41 gram min.
- Crank Bore 1.190 Crank (60 oz. min) Gear for governor can be removed.
- RINGS : OEM rings, Tension cannot be altered. Diameter of OEM ring to be comparison. Ring gap mandatory on all rings. Piston must held in cylinder by individual rings in stock location. Top ring .039 x .092 Middle ring .039 x .109 Bottom ring .018 x .089 Corrugated .098 x .090

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PREDATOR ENGINE CLASS SPECS 2024

- **These rules apply to Harbor Freight Standard Head Engines. 212 CC Model #69730 only.**
- **No Generation I or II Engines Allowed**
- **VALVE TRAIN:** No grinding or Bending on rocker arms. No bending rocker studs. Studs must remain stock length and thread pitch.
- **Shims allowed:** .020 max on Intake and Exhaust or 1 oil seal on Intake and Exhaust, Maximum .025. Shape cannot be altered. No Swaging, bottom must remain flat. SEAL MUST FREELY SEPARATE FROM INSIDE SPRING.
- Rocker Arm Adjuster Nut .825 long .491 diameter

*WARNING: Valves must be OEM from original head castings. No swapping of Valves from original Casting or Generation of Engine. Stock Valve Angle with OEM dish only. Stock Material only.

- Mechanical seal may be removed.
- Intake Valve 1.064Dia. 2.520Length 20g weight

- Exhaust Valve .982Dia. 2.520 Stock Lash Cap Present 18g weight
- Valve Stem I and X .218 No Polishing or Crosshatching
- **CAM:** EZ Spin as factory
- No plastic gear cams
- Metal Predator cores only. Factory Stamping visible to match Model and Serial number.
- Length of Journal .439 long .558 diameter Journal

***Warning: The + and – number listed below are for max and min numbers found in all of the R & D done on the cams spec'd in the Predator Series engines. Legality of cam is based off of the generation and serial number of block raced.

- Metal Gear: Base Circle: .985 (+-.003)
- DURATION: Intake(.050) 188 Intake(.200)59-61 DURATION: Exhaust(.050) 217-220 (.200) 64-73
- Cam Lift: Intake(218-220) EXHAUST (216-220)
- Valve LIFT: (I 227-232 (X 226-230) 1:1 Ratio Applies
- PUSH RODS Original Material 5.202 long .157 diameter .190 Ball Diameter 13g weight
- HEAD: Middle of Valves Min.275 (Not to vary .005 from one side of valve to opposite. Gasket lip must be visible. No Clone Heads allowed. Sealer Allowed on gasket area.
- Valve Guide- .220 no go RT series .196
- Seat- I .880 X .850 No Go's RT Series .964 I.890x
- BORE 2.757 max
- STROKE 2.155- 2.166
- LIFTER: 1.363 long .314 stem .931 Head Dia. 1.002 Block Bore 20g wt
- NO PISTON POP OUT
- PISTON .050 dish Z140110 Arrow facing pushrod 2.735 1.850 skirt 1.43 Short Skirt 150g wt.
- Piston must be unaltered in any way. Measurements and locations of Ring Lans must be stock. Piston not allowed to be swapped from original generation of engine based off of Serial Number of block.
- Piston ,Rings, Rod, Cap, Bolts, Pin 341 g wt.
- RINGS Top Ring .012 gap MAX Markings on Top(SH)
- Middle – Marking on Top Bevel Top inside(SH)
- Bottom Ring – Must be present 3pcs not broken
- ALL RINGS MUST BE UNALTERED 11g wt Top 2 Rings must support own weight in block and take shape of block. Bottom Rings must support weight of complete rod assembly.

- Ring Dimensions: Top Chrome.039.094 Middle Black .039.107 Oil .015.083
- CRANK MUST BE STOCK Governor Gear Can Be Removed Journal 1.180 Min- 1.185max Weight 60 oz. min
- ROD 2 RTC-01 Z440110 2.367 .160 oil hole Stock Rod Only
- WRIST PIN 2.125 length .709 od .540 id Wgt. 41g
- Stock Flywheel Only 5lbs 4 oz. Minimum or 5.250 min. Flywheel fins must remain stock by number of fins and length of fins. Plastic fins only. Stock Flywheel Key must be present. No Offset allowed. No grinding allowed