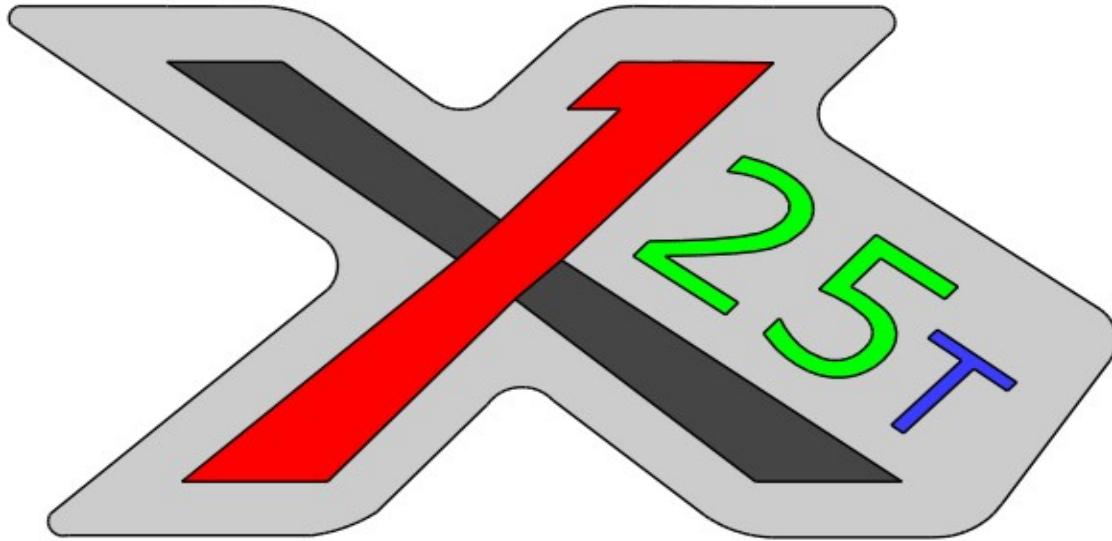


X125T - MX ENGINE



No power valve to eliminate servicing.
Engine produces very smooth power band.

One piece exhaust eliminates the flex and issues related with leaking and breaking - 22mm & 25mm exhaust restrictors available for Junior configurations

Integral water pump for easy installation of engine. Allows driver to warm engine up without rear wheels turning on the grid.

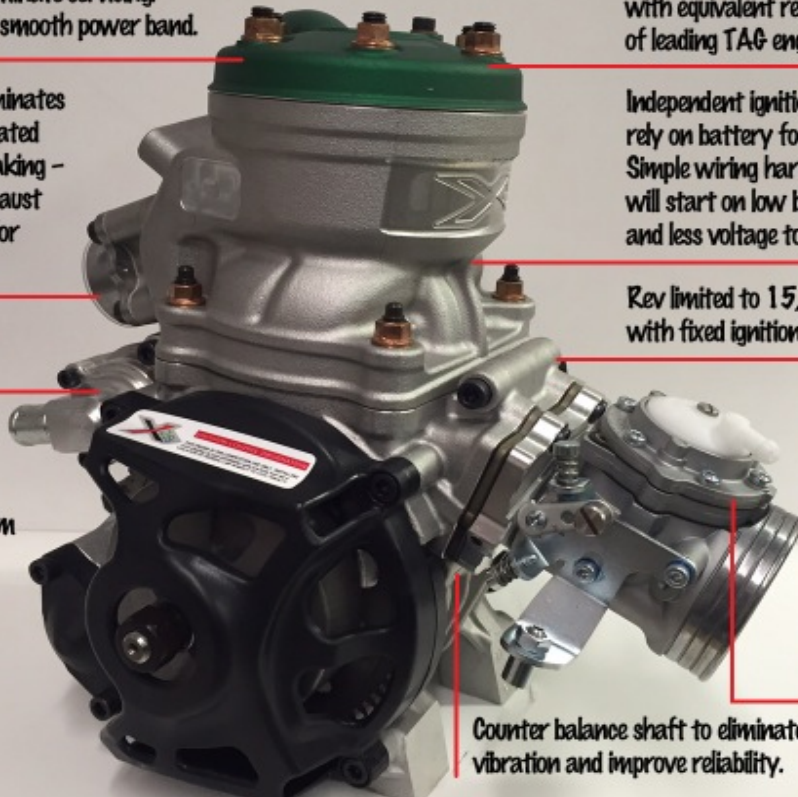
Produces 30HP with equivalent rebuild time of leading TAG engines.

Independent ignition does not rely on battery for spark. Simple wiring harness so engine will start on low battery and less voltage to crank the engine.

Rev limited to 15,500rpm with fixed ignition adjustment.

Optional Tillitson Carb - 23mm or 27mm plus 17mm & 19mm intake restrictors available for Junior configurations

Counter balance shaft to eliminate vibration and improve reliability.



Overhaul Manual January 2018



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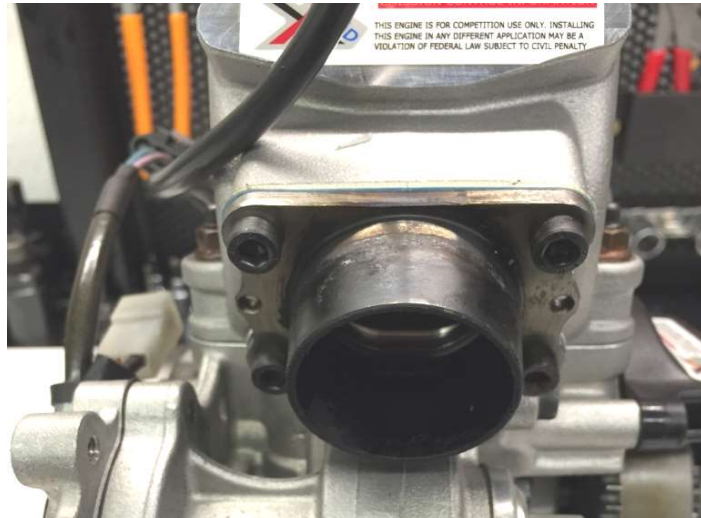
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1. ENGINE DISASSEMBLY

1.1 *REMOVE THE EXHAUST HEADER*

Remove the four M6X16 bolts. Use a 5mm allen T-handle. Remove the exhaust gasket.

Figure 1-1



1.2 *REMOVE THE IGNITION*

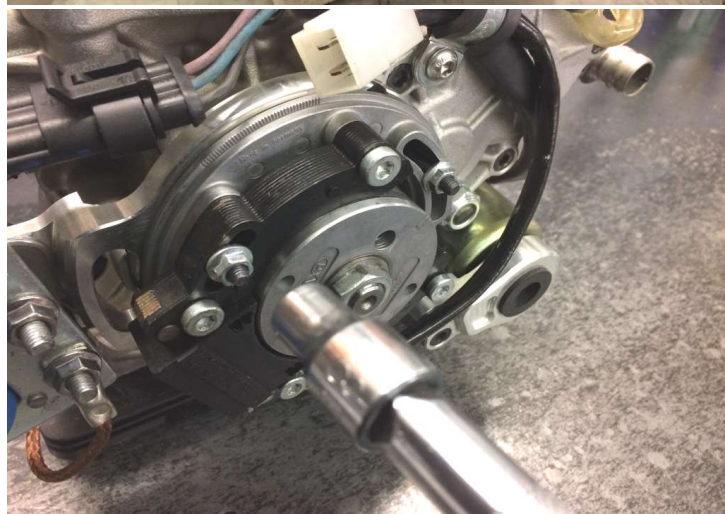
Remove the clutch cover and install the Starter Wheel Clamping Tool (PN P12.1870091) to prevent the crankshaft from turning.

Figure 1-2



1.2.1 Remove the 4 - M5X25 allen bolts and remove the stator. Use an 8mm socket.

Figure 1-3



- 1.2.2 Remove the M12 rotor nut using a 17mm wrench or socket.

Figure 1- 4



- 1.2.3 Remove the rotor using the puller (PN. A90.2710000). Be sure to collect the woodruff key from the crankshaft.

Figure 1-5



- 1.2.4 Remove the timing plate. Use a 3mm allen T-handle or Torx T25 bit and ratchet handle.

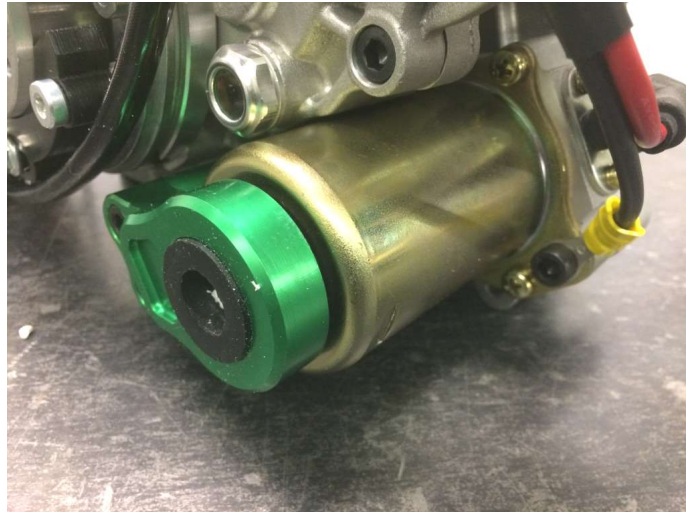
Figure 1-6



1.3 **REMOVE THE STARTER MOTOR**

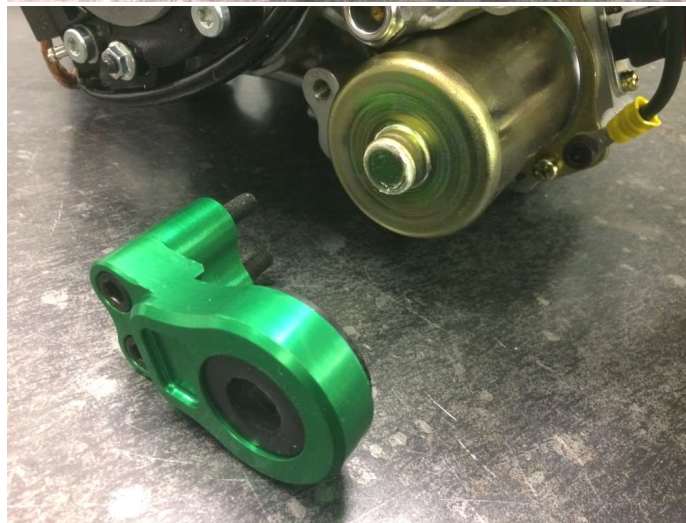
Remove the 2 - M6X40 starter support allen bolts using a 5 mm allen T-handle.

Figure 1-7



1.3.1 Remove the starter support.

Figure 1-8



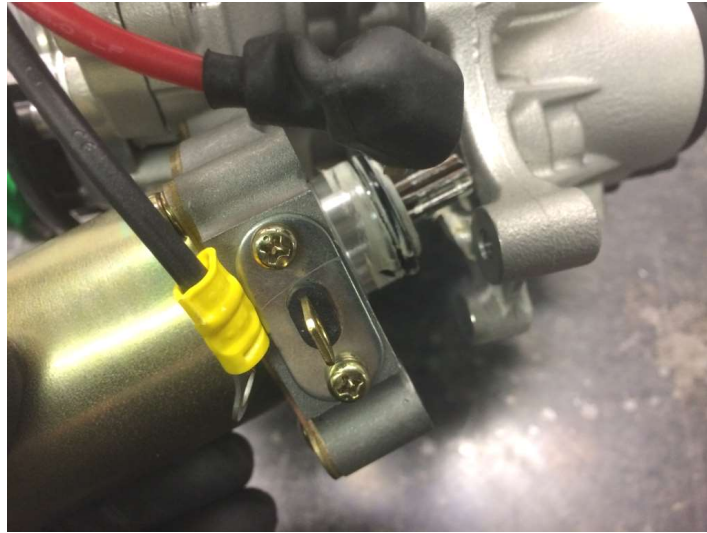
1.3.2 Remove the 2 - M6X35 starter case allen bolts using a 5 mm allen T-handle.

Figure 1-9



- 1.3.3 Remove the starter motor.

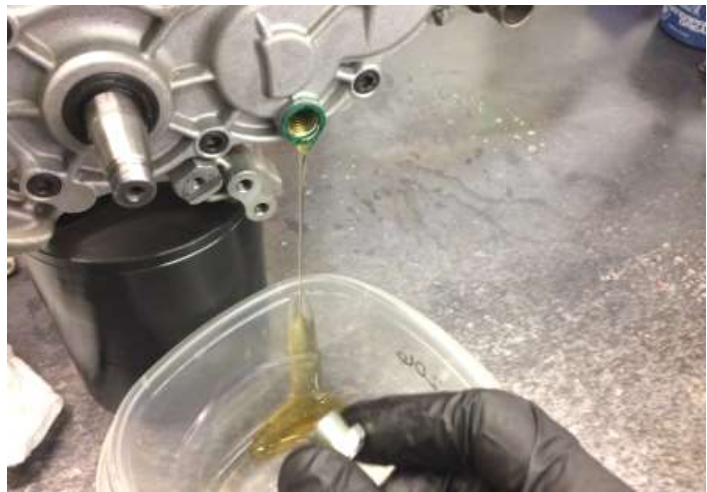
Figure 1-10



1.4 DRAIN THE OIL FROM THE ENGINE CRANKCASE

Remove the oil drain plug/sight glass and tilt the engine to drain all of the crankcase oil.

Figure 1-11



1.5 REMOVE THE GEARBOX COVER

Remove the 7 - M6X16 allen bolts using a 5 mm allen T-handle. Remove the gearbox cover and gasket using a plastic mallet if necessary.

Figure 1-12



1.6 REMOVE THE GEARS

Remove the retaining circlips from the water pump and balance shaft using circlip pliers. Remove the plastic water pump gear.

Figure 1-13



1.6.1 Note the gear timing marks for reassembly.

Figure 1-14



1.6.2 Remove crankshaft gear nut. Use a 27mm socket or wrench. Be sure to collect the 4X4X6mm key that positions the gear.

Figure 1-15



- 1.6.3 Slide the gear off the crankshaft using a large screwdriver if needed. Take care not to mark the case half gasket surface.

Figure 1-16



- 1.6.4 Remove the balance shaft gear from the balance shaft using a screwdriver if needed.

Figure 1-17



- 1.6.5 Also remove the cage spacer and Seeger ring which retain the balance shaft gear.

Figure 1-18



1.7 REMOVE THE CLUTCH

Remove the clutch cover by removing the 4 - M6X25 allen bolts using a 5mm allen T-handle.

Figure 1-19



- 1.7.1 Remove the M10 clutch nut from the clutch drum using a 17mm wrench or socket. Make sure that Starter Wheel Clamping Tool (PN P12.1870091) is in place to prevent the crankshaft from turning.

Figure 1-20



- 1.7.3 Remove the outer clutch washer, clutch drum and roller cage to reveal the clutch pad.

Figure 1-21



- 1.7.4 Remove the M20 locking nut from the clutch body using a 27mm socket.

Figure 1-22



- 1.7.5 Use the clutch pad puller (PN P10.2500091) to remove the clutch pad/starter wheel assembly.

Figure 1-23



- 1.7.6 Hold the clutch pad puller (PN P10.2500091) with a crescent wrench and an 8mm allen wrench to disengage the clutch pad/starter wheel assembly from the crankshaft.

Figure 1-24



- 1.7.5 Remove the starter wheel from the clutch pad by removing the 3 - M6X14 allen bolts using a 5 mm allen T-handle.

Figure 1-25



1.8 REMOVE THE STARTER BENDIX

Remove the starter bendix cover by removing the 2 - M6X25 allen bolts using a 5 mm allen T-handle.

Figure 1-26



- 1.8.1 Remove the starter bendix.

Figure 1-27



1.9 REMOVE THE WATER PUMP HOUSING

Remove the 3 allen bolts (1 - M5X35, 2 - M5X15) using a 4mm T-handle.

Figure 1-28



1.9.1 Remove water pump cover.

Figure 1-29



1.9.2 Remove water pump impeller. Note the left hand thread on the impeller shaft if you need to replace the impeller.

Figure 1-30



1.10 REMOVE THE CARBURETOR INLET MANIFOLD

Remove the 4 - 6X18 allen bolts using a 5 mm allen T-handle. Remove the manifold and reed cage as a whole..

Figure 1-31



1.10.1 Remove the reed cage and gasket from the manifold for inspection.

Figure 1-32



1.11 REMOVE THE CYLINDER HEAD

Use a cross pattern to loosen the 6 cylinder head nuts one half turn at a time using a 10mm socket or wrench. Remove the washers.

Figure 1-33



1.12 REMOVE THE CYLINDER

Remove the 4 cylinder nuts with a 10mm wrench.

Figure 1-34



1.12.1 Slide up the cylinder carefully on the studs.

Figure 1-35



1.13 REMOVE THE PISTON

Remove the circlips from the piston using a pick with rounded edges.

Figure 1-36



- 1.13.1 Remove piston pin using Piston Pin Assembling Tool (P.N. A90.2690000). Remove piston. Remove top end roller cage.

Figure 1-37



1.14 ***SPLIT THE CRANKCASE***

- Slide off the cylinder base gasket(s).

Figure 1-38



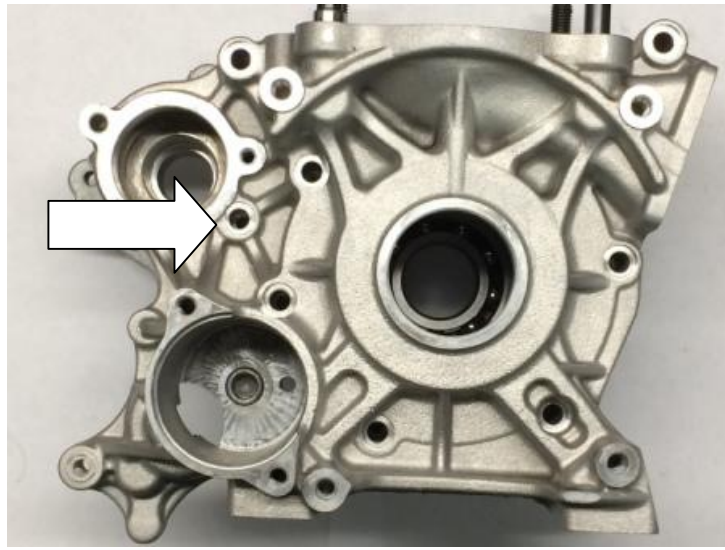
- 1.14.1 Remove the 8 - M6 allen bolts using a 5 mm allen T-handle

Figure 1-39



1.14.2 Note there are 7 - M6X45 allen bolts and one M6X30 allen bolt. The M6X30 allen bolt goes closest to the water pump as indicated.

Figure 1-40



1.14.3 Split the case halves with a plastic mallet by tapping on the base feet to separate.

Figure 1-41



1.14.4 Also tapping on the end of the crankshaft helps to separate the case halves.. Take care to not let the crankshaft fall.

Figure 1-42



1.15 REMOVE THE CRANKSHAFT

Carefully remove the crankshaft assembly from one case half and then the other.

Figure 1-43



1.16 REMOVE OIL SEALS

Use a screwdriver to gently tap out the seals.

Figure 1-44



1.17 REMOVE BEARINGS

Remove the main bearings from the case halves by pressing them out. Remove the balance gear outer bearing by lightly heating the case and lifting out.

Figure 1-45



- 1.17.1 Remove any bearing spacers (0.10mm, 0.15mm or 0.20mm). Note the spacer gap location for the lubrication hole.

Figure 1-46



- 1.17.2 Remove the water pump seal using the water pump oil seal puller (PN A90.4178300).

Figure 1-47



- 1.17.3 Remove the water pump bearings by gently tapping out with a rod, one side then the other.

Figure 1-48



1.17.4 Wash all parts thoroughly in solvent, inspect and replace if signs of wear..

Figure 1-49







2. CRANKSHAFT ASSEMBLY/DISASSEMBLY

The assembly and disassembly on the crankshaft should be undertaken by a qualified service centre using the specifically designed tools listed in Table 2-1 below. Use of incorrect tools or unskilled technicians may damaged the crankshaft beyond repair.

Table 2-1 Crankshaft Tools

Description	Part No.
Crankshaft Assembly Kit	10110B-C
Crankshaft Disassembly Tool	A012
Crank Pin Thrust Washer	10150A
Crankshaft Disassembly Kit Includes	10100A-C2
Crankshaft Support	10100
Crankshaft Plate	10104A
Crankshaft Insert	10106
Crankshaft Pusher	10107

2.1 CRANKSHAFT DISASSEMBLY

- 2.1.1 Put the disassembly tool under a 5 ton press. Place the crankshaft into the disassembly tool and place the crankshaft plate in between the crank halves. (P.N. A90.4143111)

Figure 2-1



- 2.1.2 Place the crankshaft insert and using the crankpin pusher press out the crankpin.

Figure 2-2





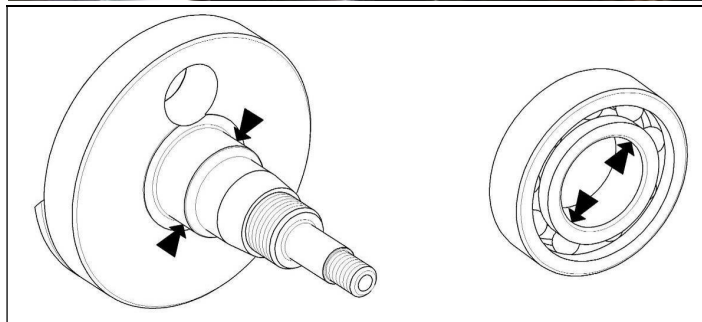
2.1.3 Disassemble the complete connecting rod with thrust washers. Repeat to remove the crankpin from the other crank half.

Figure 2-3



2.1.4 Check the shaft and bearing surfaces at a variety of points for ovalization on the circumference. Refer to Table 2-2 for the shaft and bearing tolerances.

Figure 2-4



Before reassembling, wash all parts thoroughly in clean solvent. Check all parts for wear according to the following tolerances:

- Check connecting rod for ovalization exceeding 0.006mm using a dial bore gauge with 26 mm and 19 mm check rings. If so replace the connecting rod. Also replace connecting rod if severe discoloration noticed.
- Check the crank pin with a visual check and replace if necessary. The crank pin should be replaced after 30 hours of running.
- Check the big end cage with a visual check and replace if necessary. The big end cage should be replaced after 30 hours running.
- Check for wear on the crank halves including the bearing journals at various points. Refer to Table 2-2 for the bearing journal tolerances.
- Check for wear on the big end thrust washers and replace if necessary.

Table 2-2 Crankshaft, Balance shaft and Bearing Wear Evaluation

Shaft and Bearing	Tolerance (mm)
Crankshaft main bearing journal	Minimum 24.95
Balance gear external bearing case journal	Maximum 57.97
Balance gear shaft internal bearing journal	Minimum 14.95
Note: The difference in journal - bearing diameter should not exceed 0.05mm.	

2.2 CRANKSHAFT ASSEMBLY

- 2.2.1 Place the crank assembly jig into a press (minimum 5 ton). Place the first crank half into the crank assembly jig. Lubricate the crank pin hole in the crank half. Place the crankpin with the crank assembly tool (# A90.4143111) onto the first crank half.



Figure 2-5

- 2.2.2 Lower the upper plate of the crank assembly jig to the crank half.



Figure 2-6

- 2.2.3 Progressively push in the crank pin until completely driven in.



Figure 2-7

- 2.2.4 Remove the crank assembly tool from the crankpin and rotate the crank assembly jig to the horizontal position.

Figure 2-8



- 2.2.5 Lubricate crankpin and install the first thrust washer, the bottom end cage, connecting rod and the second thrust washer. Keep the cardboard retainer inside the cage, place on the end of the pin and slide the cage onto the pin in order to prevent the rollers from falling out.

Figure 2-9



- 2.2.6 Place the second crank half into the seat of the crank assembly tool counter plate.

Figure 2-10





- 2.2.7 Push the two crank assembly tool plates and crank halves together by hand. Lubricate the crankpin and crankpin hole on the second crank half.

Figure 2-11



- 2.2.8 Rotate the crank assembly jig to the vertical position. Progressively press the two crank halves together. Open the tool and rotate it to the horizontal position to remove the assembled crankshaft.

Figure 2-12



- 2.2.9 Check the axial play of the connecting rod with a feeler gauge. Maximum play - 0.7mm and minimum play - 0.3mm. If the play is outside these limits, rebuild the crankshaft assembly.

Figure 2-13



2.2.10 The crankshaft assembly must now be checked for alignment. A misaligned crankshaft assembly may cause excessive vibration, hard starting and poor acceleration. Place the crankshaft assembly between lathe or other centers. Use dial indicators to measure the alignment on the left and right bearing journals. Rotate the crankshaft assembly noting the dial gauge deflection at each bearing journal. The deflection must be less than 0.025mm (0.001") on each bearing journal. Figure 2-14



2.2.11 Adjust the alignment with a copper or brass hammer if necessary.

Figure 2-15



3. ENGINE ASSEMBLY

3.1 *INSTALLING THE BEARINGS AND SEALS*

Before assembling, wash all parts with solvent. Place the case halves into the press. Insert bearing shims as came out on disassembly. (0.10, 0.15, 0.20 or 0.30mm available) Note the shim gap to be placed at the lubrication galley. Figure 3-1



- 3.1.1 Place the main bearings into the case halves with the balls visible showing up in the bearing seat. Insert the balance gear outer bearing into the case half.

Lubricate the outside of the bearings and the bearing seats.

Figure 3-2



- 3.1.2 Lubricate the bearing outside, bearing pocket in the case halves and the bearing race. Use a press to insert the main bearings into the case halves. An alternative is to heat the case half to 300F and drop in the main bearing.

Figure 3-3



- 3.1.3 Place the water pump impeller bearing with balls visible showing up in the bearing seat. Lubricate the bearing balls, the outside of the bearings and the bearing seats before installation.

Figure 3-4



- 3.1.4 Use a bearing insert tool to press the bearing into the bearing seat. An alternative is to heat the case half to 300F and drop in the water pump bearing.

Figure 3-5



- 3.1.5 Add a light coating of grease to the inside of the water pump seal lip.

Figure 3-6



- 3.1.6 Insert the water pump seal using the water pump seal assembling tool (PN A90.4120000).

Figure 3-7



- 3.1.7 Note the seal lip should be facing toward the water pump impeller.

Figure 3-8



3.2 ***CRANKCASE ASSEMBLY***

Insert the crankshaft assembly into the case half. Lubricate the bearing balls, the inside of the bearings and the bearing journals before installation.

Figure 3-9



- 3.2.1 To check the crankshaft axial play, assemble the crankcase halves with 4 - M6X45 allen bolts and check that the axial play is within $0.20\text{mm} \pm 0.05\text{mm}$. If the axial play is outside this range disassemble the crankcase and change out the shims to bring the axial play within the range. The shims should be equally positioned. Figure 3-10



- 3.2.2 Before final assembling of the case halves, apply liquid gasket onto the mating surfaces, taking care around the water pump housing.

Figure 3-11



- 3.2.3 Assemble crankcase halves with the 7 - M6X45 allen bolts and one M6X30 allen bolt (closest to the water pump) using a 5mm T-handle.

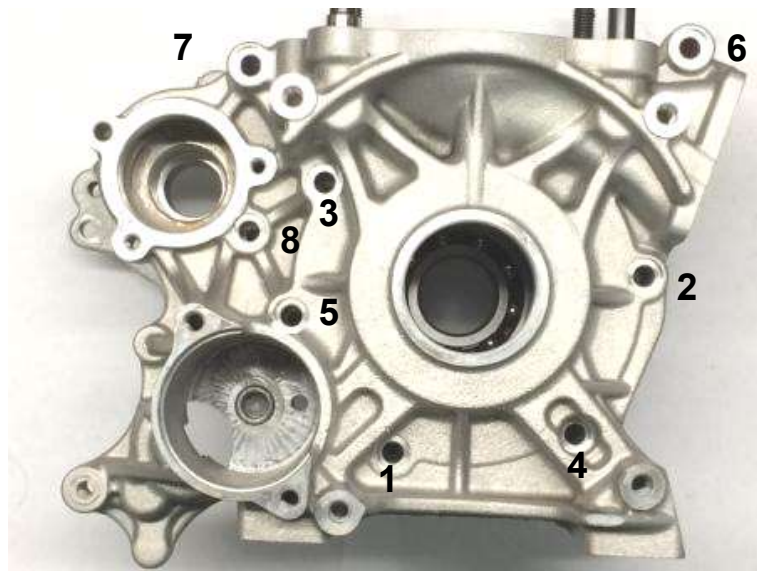
Figure 3-12





- 3.2.4 Use the cross pattern to torque the 8 - M6 allen bolts to 8 - 10 Nm (70 - 90 in-lb).

Figure 3-13



3.3 *INSTALLING THE SEALS*

Apply a light coating of grease to the inner seal lips before installing. Note when the seals are installed it is normal to notice a little more drag when rotating the crankshaft. Install the gear side seal with the 25mm Oil Seal Assembling Tool (PN A90.4130000)

Figure 3-14

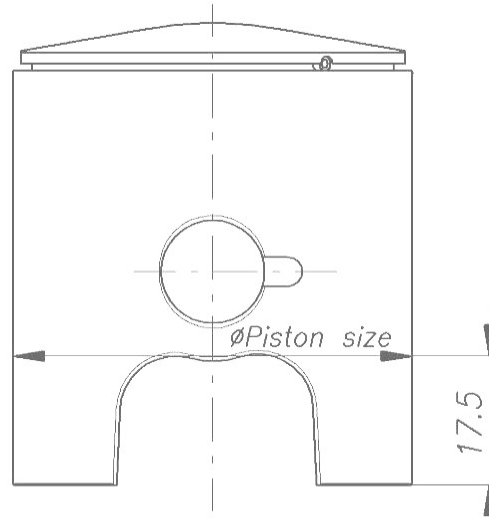


3.4 INSTALLING THE PISTON

Check the ring gap using a feeler gauge which should be within a range of 0.25 and 0.30mm. Also check the piston clearance with a dial bore gauge. It should be within a range of 0.11 - 0.12mm. If the clearance is greater than 0.14mm, replace the piston.
Figure 3-15



3.4.1 Pistons are measured at 17.5mm from the skirt bottom. The piston diameter at the skirt is the number marked on the piston dome.
Figure 3-16



3.4.2 Install the top end cage into the top end of the connecting rod. Add a light amount of oil to the top end cage before installing.

Figure 3-17



- 3.4.3 Install the piston pin into the piston and top end cage in the top end of the connecting rod.

Figure 3-18



- 3.4.4 Place the piston circlip into the circlip assembly tool (PN 10120)

Figure 3-19



- 3.4.5 Install the circlip into the piston using the circlip assembly tool. Install the circlip so that the gap is pointing upwards.

Figure 3-20



- 3.4.6 Install the ring onto the piston ensuring that the ring gap is sitting over the pin in the ring land.

Figure 3-21



3.5 **INSTALLING THE CYLINDER**

Install the cylinder over the piston and onto the crankcase. Install a new base gasket (0.10, 0.20, 0.30 or 0.50mm) on the cylinder base. Lubricate the cylinder liner and piston.

Figure 3-22



- 3.5.1 Install 4 - M8 nuts onto the cylinder studs with a 10mm wrench. Torque to 18 - 22 Nm (160 - 190 in-lb).

Figure 3-23



3.6 *INSTALLING THE CYLINDER HEAD*

Place the 6 cylinder tie rod o-rings over the tie rods, and place the inner o-ring onto the cylinder. Place the outer o-ring onto the cylinder head. Install the cylinder head over the tie rods and inner o-ring.

Figure 3-24



- 3.6.1 Install the 6 - M8 nuts onto the cylinder studs with a 10mm wrench. Torque to 18 - 22 Nm (160 - 190 in-lb).

Figure 3-25



3.7 *INSTALLING THE WATER PUMP*

Place the water pump impeller into the crankcase housing. Place a light coat of oil on the impeller shaft before installing.

Figure 3-26



- 3.7.1 The impeller should sit substantially in the housing after installation.

Figure 3-27



- 3.7.2 The impeller shaft should protrude into the gear box side of the crankcase.

Figure 3-28



3.8 ***INSTALLING THE GEAR BOX***

Install the gear box side 4X4X8mm key into the crankshaft journal.

Figure 3-29



- 3.8.1 Install the crankshaft gear over the key and crankshaft journal.

Figure 3-30



- 3.8.2 Place the concave washer over the crankshaft and a couple drops of red Loctite on the crankshaft gear threads then install the M20 crankshaft nut.

Figure 3-31



- 3.8.3 Install the M20 crankshaft gear nut with a 27mm deep socket. Torque to 50 - 55 Nm (440 - 490 in-lb).

Figure 3-32



- 3.8.4 Place a thin coat of oil on to the inner balance gear mating surface.

Figure 3-33



- 3.8.5 Insert balance gear on to the balance shaft and align the timing marks on the crankshaft and balance gears. Note misalignment of the balance gear timing marks may cause excessive vibration and poor engine performance.

Figure 3-34



- 3.8.6 Note the balance gear runs on a roller cage, and is secured in place by a spacer and Seeger ring.

Figure 3-35



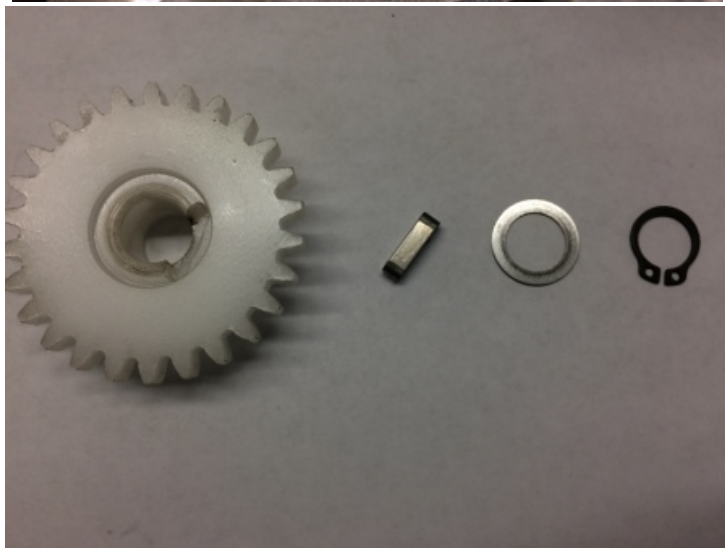
- 3.8.7 Install the balance gear
Seeger ring with snap ring
pliers.

Figure 3-36



- 3.8.8 The water pump gear
assembly consists of the
plastic gear, key, spacer and
Seeger ring. Inspect all
parts for wear and replace if
necessary.

Figure 3-37



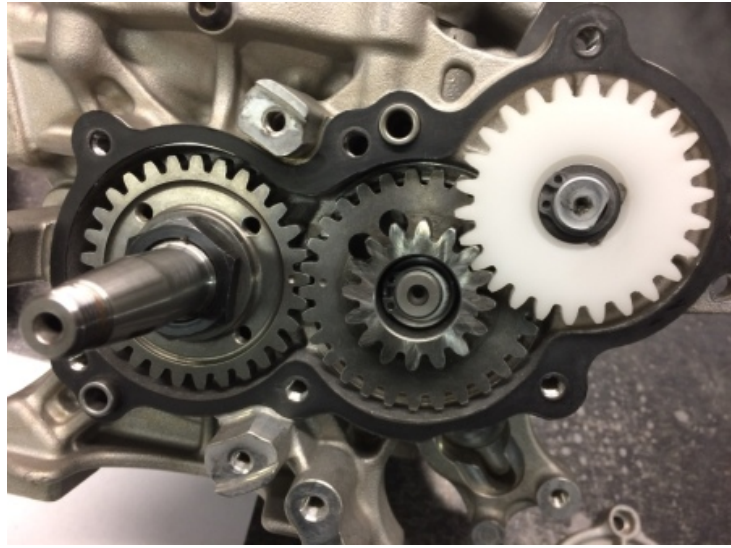
- 3.8.9 Install the water pump gear,
key, spacer and retain the
assembly with the Seeger
ring. Use snap ring pliers to
install the Seeger ring.

Figure 3-38



- 3.8.10 Install the gear cover gasket over the gear assembly.

Figure 3-39



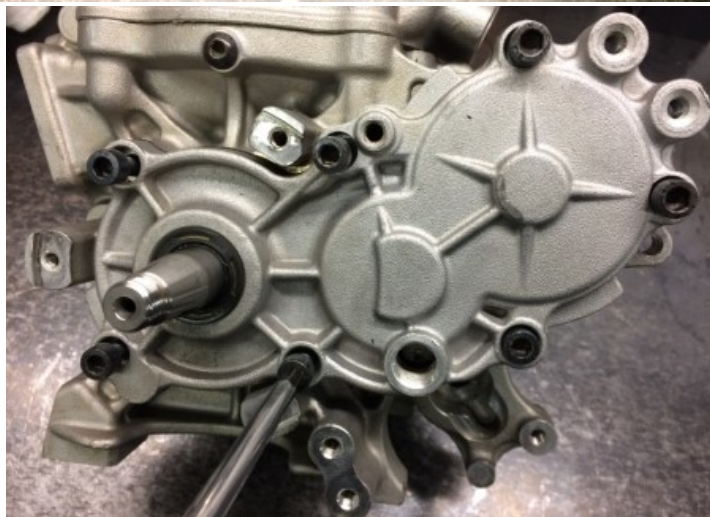
- 3.8.11 Install the gear cover seal using the 25mm crankcase oil seal assembling tool (PN A90. 4130000). Apply a light coat of grease to the inside lip of the seal surface.

Figure 3-40



- 3.8.12 Install the gear cover onto the crankcase using the 7 - M6X18 allen bolts and a 5mm T-handle. Torque to 8 - 10 Nm (70 - 90 in-lb) using a cross pattern tightening opposing allen bolts.

Figure 3-41



- 3.8.13 Install the starter bendix.
Apply a light coat of grease
onto the journals on each
end.

Figure 3-42



- 3.8.14 Install the bendix cover with
the 2 - M6X35 bolts. Torque
to 8 - 10 Nm (70 - 90 in-lb).

Figure 3-43



3.9 *INSTALLING THE CLUTCH PAD AND STARTER WHEEL ASSEMBLY*

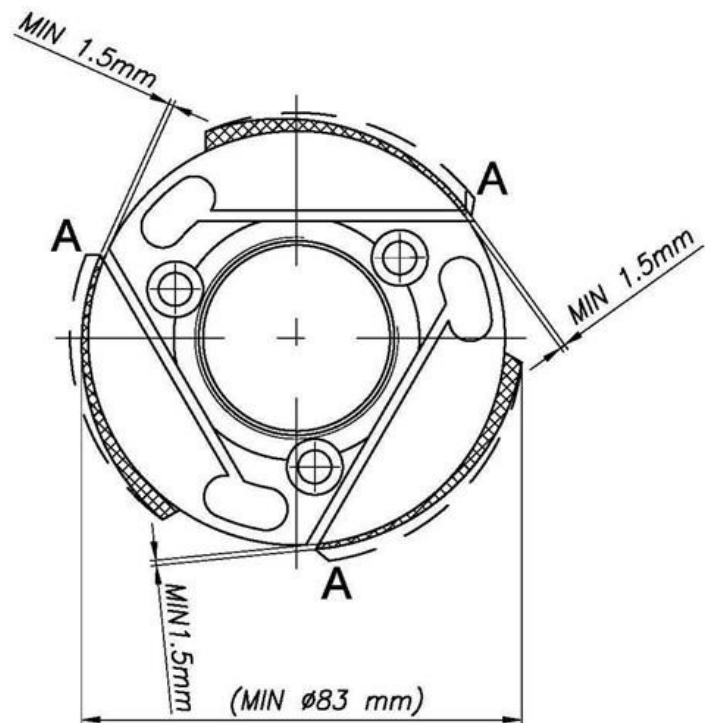
Install the woodruff key into
the PTO side of the
crankshaft.

Figure 3-44



- 3.9.1 Inspect the clutch pad for significant wear and replace if necessary. Replace the clutch pad if the leading edge of the clutch pad shoes are less than 1.5mm.

Figure 3-45



- 3.9.2 Re-install the clutch pad onto the starter wheel with the 3 - M6X14 bolts using a 5mm allen T-handle or socket. Torque to 9 - 11 Nm (80 - 100 in-lb).

Figure 3-46



- 3.9.3 Install the clutch pad and starter wheel assembly onto the PTO side of the crank.

Figure 3-47



- 3.9.4 Secure the clutch pad and starter wheel assembly with the M20 concave washer and nut.. Hold the starter wheel with the Starter Wheel Clamping Tool (PN P12.1870091). Torque to 50 - 55 Nm (440 - 490 in-lb).

Figure 3-48



3.10 *INSTALLING THE IGNITION*

Place the woodruff key in the crankshaft keyway.

Figure 3-49





- 3.10.1 Place the ignition rotor onto the crankshaft and woodruff key. Secure the rotor with the M10 rotor nut using a 17mm socket.

Figure 3-50



- 3.10.2 Place the piston stop into the spark plug hole to prevent the crankshaft from turning. Torque to 40 NM (360 in-lb).

Figure 3-51



- 3.10.3 Install the Starter Wheel Clamping Tool Tool (PN P12.1870091) to secure the crankshaft. Add a drop of blue Loctite to the 3 - M5X12 flathead allen bolts. Secure with a 3mm allen T-handle or Torx T25 bit and ratchet handle. Torque to 5 - 6 Nm (45 - 50 in-lb).

Figure 3-52





- 3.10.4 Place the stator onto the 2 locating pins in the slot. secure with the 2 - M5X40 studs and M5X30 stud, using the 3 - M5 flange nuts. Torque to 5 - 6 Nm (45 - 50 in-lb).

Figure 3-53



3.11 *INSTALLING THE STARTER*

Lubricate the o-ring before inserting the starter in the crankcase seat. Check that the power cable to the starter is in place and secured with a tie-wrap. Secure the starter with the 2 - M6X35 allen bolts using a 5mm T-handle. Torque to 8 - 10 Nm (70 - 90 in-lb). Note - If M6X40 bolts are tightened into the crankcase, damage will result.

Figure 3-54



- 3.11.1 Place the starter support over the stud on the starter cover. Ensure the starter ground cable is secured under the outer M6X35 allen bolt. Insert the 2 - M6X40 allen bolts and secure with a 5mm T-handle. Torque to 8 - 10 Nm (70 - 90 in-lb).

Figure 3-55



3.12 *FILLING THE GEARBOX WITH LUBRICANT*

Insert the oil level control cap and gasket into the gearbox cover. Tighten with a 13mm wrench.

Figure 3-56



- 3.12.1 Fill the gearbox to the top with Xeramic KF Kart Gear Oil (PN A90.1970000). This oil should be checked and topped off regularly if needed. Insert the crankcase breather cap and aluminium washer into the fill hole and tighten with a 13mm wrench.

Figure 3-57



3.13 *CONNECT THE WIRING HARNESS*

Connect the stator cable clamp over the stator wiring harness and attach to the gearbox side cover with the M6X16 button head allen bolt. Use a 4mm T-handle.

Figure 3-58



3.13.1 Connect the stator wire harness to the coil wire harness. Note the orientation of the connectors and secure the fastening clip.

Figure 3-59



3.14 *INSTALL THE EXHAUST HEADER*

Place a fresh exhaust manifold gasket and any exhaust spacers onto the exhaust port. Install the exhaust manifold using the four M6X16 allen bolts and a 5mm T-handle. Torque to 8 - 10 Nm (70 - 90 in-lb).

Figure 3-60



3.15 *INSTALL THE WATER PUMP COVER AND ELBOW HOSE*

Place the water pump gasket and o ring onto the water pump cover. Place a light coating of oil onto the o ring to facilitate installation.

Figure 3-61



- 3.15.1 Install the water pump cover with the 2 - M5X16 allen bolts and 1 - M5X35 allen bolt using a 4mm T-handle. Torque to 6 - 8 Nm (50 - 70 in-lb). Attach the elbow water hose with the hose clamps.

Figure 3-62



3.16 *INSTALL THE CLUTCH DRUM*

Assemble the clutch drum/sprocket, cage washer and M10 nut. Inspect each and if worn, replace.

Figure 3-63



3.16.1 Apply a light coat of bearing grease to the cage before assembly.

Figure 3-64



3.16.2 Insert the cage into the clutch drum/sprocket.

Figure 3-65



3.16.3 Place the drum/sprocket and cage onto the clutch pad hub.

Figure 3-66





- 3.16.4 Place the washer over the M10. Make sure that the chamfered inner edge of the washer is facing the crankshaft step.

Figure 3-67



- 3.16.5 Place the M10 clutch outer nut onto the crank with a 17mm wrench or socket.

Figure 3-68



- 3.16.6 Torque the M10 outer clutch nut to 30 - 40 Nm (265 - 350 in-lb) using the Starter Wheel Clamping Tool (PN P12.1870091) to hold the crankshaft from turning.

Figure 3-69



3.17 INSTALL THE REED CAGE AND INTAKE MANIFOLD

Inspect and clean with solvent the reed cage and intake manifold before installing. The reeds should be free from any cracks or chips. Replace the reeds if you detect and damage.

Figure 3-70



- 3.17.1 Place the reed cage and manifold gaskets into their positions ensuring the carb pulse hole is unobstructed in the reed cage and manifold.

Place the reed cage/manifold assembly into the engine intake as an assembly.

Figure 3-71



- 3.17.2 Secure the reed cage/manifold assembly with the 4 - M6X18 allen bolts using a 5mm T-handle.

Figure 3-72







APPENDIX 1 - TORQUE VALUES

NOMINAL SIZE	Q.TY	FASTENER NAME	WRENCH	VALUES(Nm)	VALUES(in•lb)
M14 x 1.25	1	Spark plug	Hex.20.8	20 – 26	175 – 230
M8 x 1.25	4	Head and cylinder nut	Hex. 13	18 – 22	160 – 190
M8 x 1.25	2	Exhaust nut	Hex. 13	18 – 22	160 – 190
M6 x 1	4	Reed group screw	Allen 5	8 – 10	70 – 90
M6 x 1	2	Carb. fixing stud-bolt	Allen 5	6 – 10	50 – 90
M5 x 0.8	4	Ign.Digit."K"stator fixing screw	Allen 4	5 – 6	45 – 50
M10 x 1	1	Ign.Digit."K" rotor fixing nut	Hex. 17	20 – 26	175 – 230
M6 x 1	3	"Bendix" support screw	Allen 5	6 – 8	50 – 70
M6 x 1	2	Starter fixing screw	Allen 5	8 – 10	70 – 90
M6 x 1	3	Clutch cover fixing screw	Allen 5	8 – 10	70 – 90
M10 x 1	1	Clutch drum holding nut	Hex. 17	30 – 40	265 – 350
M20 x 1	1	Starter ring fixing nut	Hex. 30	100–110	885 – 970
M5 x 0.8	4	Engine sprocket fixing screw	Allen 3	6 – 8	50 – 70
M6 x 1	3	Clutch fixing screw	Hex. 10	9 – 11	80 – 100
M6 x 1	10	Crankcase fixing screw	Allen 5	8 – 10	70 – 90
M6 x 1	7	Gears cover fixing screw	Allen 5	8 – 10	70 – 90
M5 x 0.8	1	Bal. shaft bearing fix. screw	Allen 3	6 – 8	50 – 70
M6 x 1	2	Coil fixing nut	Hex. 10	8 – 10	70 – 90
M6 x 1	2	Coil/starter ground. fix. screw	Allen 5	8 – 10	70 – 90
M10 x 1	2	Oil charge/discharge plug	Hex. 17	12 – 15	105 – 130



APPENDIX 2 - X125T OVERHAUL TOOLS LIST

1
2

Description	Part No.
Crankshaft Assembling Tool	A90.4143111
Crankshaft Disassembling Tool	A012
Piston Pin Assembling Tool	A90.2690000
Circlip Assembly Tool	10120
PVL Ignition Rotor Puller	A90.2710000 or 10826-C
Clutch Puller	P10.2500091 or A449
Balancing Shaft Pin Assembling Tool	A12.1743300
Spark Plug Insert/Piston Stop	A90.2700000 or KM199
Water Pump Oil Seal Disassembling Tool	A90.4178300
Water Pump Oil Seal Assembling Tool	A90.4178300
17mm Diameter Oil Seal Assembling Tool	A90.4120000
25mm Diameter Crankcase Oil Seal Assembling Tool	A90.4130000
Opening Angles Control Tool	A90.5238500
Starter Wheel Clamping Tool X125T	P12.1870091
Head Profile Tech Gauge	SZ0.03961



APPENDIX 3 - SPROCKET RATIO CALCULATOR

Table 1 Sprocket Ratio Chart

Axle Sprocket Teeth	Engine Sprocket Teeth				
	10	11	12	13	16
72	7.20	6.55	6.00	5.53	4.50
73	7.30	6.64	6.08	5.62	4.56
74	7.40	6.73	6.17	5.69	4.63
75	7.50	6.82	6.25	5.77	4.69
76	7.60	6.91	6.33	5.85	4.75
77	7.70	7.00	6.42	5.92	4.81
78	7.80	7.09	6.50	6.00	4.88
79	7.90	7.17	6.58	6.08	4.94
80	8.00	7.27	6.67	6.15	5.00
81	8.10	7.36	6.75	6.23	5.06
82	8.20	7.45	6.83	6.31	5.13
83	8.30	7.55	6.92	6.38	5.19
84	8.40	7.64	7.00	6.46	5.25
85	8.50	7.73	7.08	6.54	5.31
86	8.60	7.82	7.17	6.62	5.38
87	8.70	7.91	7.25	6.69	5.44
88	8.80	8.00	7.33	6.76	5.50
89	8.90	8.09	7.42	6.84	5.56
90	9.00	8.18	7.50	6.92	5.63
91	9.10	8.27	7.58	7.00	5.69
92	9.20	8.36	7.67	7.08	5.75
93	9.03	8.45	7.75	7.15	5.81

For operation at a maximum of 15,500 RPM see Table 2.

During testing we recommend using a tachometer for recording the maximum obtained engine RPM. Use spark plug caps with a resistance of 5 kilo ohms to avoid the interference between the engine ignition and the tachometer and/or telemetry.

The following should clarify the procedure for the optimization of the sprocket ratio. Assume you have a 10 tooth engine sprocket and that during the preliminary testing a 70 tooth axle sprocket has been used. From Table 1 with a 10 tooth engine sprocket and a 70 tooth axle sprocket, a sprocket ratio of 7.00 is determined.



Make a few laps on the track and record the maximum engine RPM achieved. Assume that you record a maximum RPM of 13,600 RPM. Looking at Table 2, to achieve a maximum RPM of 15,500 RPM a sprocket ratio between 7.83 and 8.05 should be used if during testing a sprocket ratio of 7.00 was used and a maximum RPM 13,600 achieved. From Table 1, for a 10 tooth engine sprocket an axle sprocket from 78 to 81 should be chosen. If you change the engine sprocket to an 11 tooth, then you would require an axle sprocket between 86 and 88 on Table 1 to achieve the similar 7.83 to 8.05 sprocket ratio from Table 2.

Table 2 Sprocket Ratio Change for 15,500 RPM

Sprocket ratio to achieve max 15500 RPM																		
Engine max RPM during tests	Sprocket ratio																	
	5,71	5,9	6,1	6,29	6,48	6,67	6,87	7,06	7,26	7,45	7,64	7,84	8,03	8,22	8,42	8,61	8,8	9
13000	6,81	7,03	7,27	7,50	7,73	7,95	8,19	8,42	8,66	8,88	9,11	9,35	9,57	9,80	10,04	10,27	10,49	10,73
13200	6,70	6,93	7,16	7,39	7,61	7,83	8,07	8,29	8,53	8,75	8,97	9,21	9,43	9,65	9,89	10,11	10,33	10,57
13400	6,60	6,82	7,06	7,28	7,50	7,72	7,95	8,17	8,40	8,62	8,84	9,07	9,29	9,51	9,74	9,96	10,18	10,41
13600	6,51	6,72	6,95	7,17	7,39	7,60	7,83	8,05	8,27	8,49	8,71	8,94	9,15	9,37	9,60	9,81	10,03	10,26
13800	6,41	6,63	6,85	7,06	7,28	7,49	7,72	7,93	8,15	8,37	8,58	8,81	9,02	9,23	9,46	9,67	9,88	10,11
14000	6,32	6,53	6,75	6,96	7,17	7,38	7,61	7,82	8,04	8,25	8,46	8,68	8,89	9,10	9,32	9,53	9,74	9,96
14200	6,23	6,44	6,66	6,87	7,07	7,28	7,50	7,71	7,92	8,13	8,34	8,56	8,77	8,97	9,19	9,40	9,61	9,82
14400	6,15	6,35	6,57	6,77	6,98	7,18	7,39	7,60	7,81	8,02	8,22	8,44	8,64	8,85	9,06	9,27	9,47	9,69
14600	6,06	6,26	6,48	6,68	6,88	7,08	7,29	7,50	7,71	7,91	8,11	8,32	8,53	8,73	8,94	9,14	9,34	9,55
14800	5,98	6,18	6,39	6,59	6,79	6,99	7,19	7,39	7,60	7,80	8,00	8,21	8,41	8,61	8,82	9,02	9,22	9,43
15000	5,90	6,10	6,30	6,50	6,70	6,89	7,10	7,30	7,50	7,70	7,89	8,10	8,30	8,49	8,70	8,90	9,09	9,30
15200	5,82	6,02	6,22	6,41	6,61	6,80	7,01	7,20	7,40	7,60	7,79	7,99	8,19	8,38	8,59	8,78	8,97	9,18
15400	5,75	5,94	6,14	6,33	6,52	6,71	6,91	7,11	7,31	7,50	7,69	7,89	8,08	8,27	8,47	8,67	8,86	9,06
15500	5,71	5,90	6,10	6,29	6,48	6,67	6,87	7,06	7,26	7,45	7,64	7,84	8,03	8,22	8,42	8,61	8,80	9,00
15600	5,67	5,86	6,06	6,25	6,44	6,63	6,83	7,01	7,21	7,40	7,59	7,79	7,98	8,17	8,37	8,55	8,74	8,94
15800	5,60	5,79	5,98	6,17	6,36	6,54	6,74	6,93	7,12	7,31	7,49	7,69	7,88	8,06	8,26	8,45	8,63	8,83
16000	5,53	5,72	5,91	6,09	6,28	6,46	6,66	6,84	7,03	7,22	7,40	7,60	7,78	7,96	8,16	8,34	8,53	8,72
16200	5,46	5,65	5,84	6,02	6,20	6,38	6,57	6,75	6,95	7,13	7,31	7,50	7,68	7,86	8,06	8,24	8,42	8,61
16400	5,40	5,58	5,77	5,94	6,12	6,30	6,49	6,67	6,86	7,04	7,22	7,41	7,59	7,77	7,96	8,14	8,32	8,51
16600	5,33	5,51	5,70	5,87	6,05	6,23	6,41	6,59	6,78	6,96	7,13	7,32	7,50	7,68	7,86	8,04	8,22	8,40
16800	5,27	5,44	5,63	5,80	5,98	6,15	6,34	6,51	6,70	6,87	7,05	7,23	7,41	7,58	7,77	7,94	8,12	8,30
17000	5,21	5,38	5,56	5,74	5,91	6,08	6,26	6,44	6,62	6,79	6,97	7,15	7,32	7,49	7,68	7,85	8,02	8,21



APPENDIX 4 - ENGINE RUNNING SHEET

Running/mounting instructions:

Fuel/Oil mixture 16:1 or 6%

Carb settings for Tryton HB27- L 1¼ H 1¼

Carb settings for 23mm Tillotson HL334AB – L 1¾ H1

Carb settings for 27mm Tillotson – L 1¾ H1

Please note that you may require an engine plate (PN [A-120800A](#)) if your motor mount does not have a cut out on the back to accommodate the starter motor.

Case comes with oil, PLEASE check and top up prior to running. Requires 60cc or 60ML total.
Recommended gear oil PN [00601](#).

****We recommend checking your gear lube level before any event, and replace oil after 20 hours.**

Rev Limiter 15500 maximum rpm

Recommended Spark Plug NGK BR10EG