"The ENYA Model Engine Compendium"
By BOB ALLAN____
<u>All engines below follow on from the 3-bolt front housing 19</u>

"It was with a .19 cu. in. motor that the Enya brothers began the quantity production of model engines 24 years ago. Prior to this, they had made sandcast
.60 and .63 cu. in. motors and also some sandcast .19 units, but it was the original production Enya 19, followed by the first Enya 29, that set the Enya Metal
Products Company Ltd. of Tokyo on the road to becoming one of Japan's two major model engine manufacturers."

(Quote from Peter Chinn, Model Airplane News, October 1976)

Associated Models	***Source***	***Comments***	***Inferences***
The earliest Enya leaflet we know of (circa 1952) depicts the **3-bolt 19** alongside the **sand-cast 29** with the **Red Head.**	Possibly the first ever Enya factory instruction sheet to be printed in English. The **19** shown has a 7 fin head	Significant in that it shows the first two, limited production, sand-cast models side by side. Max power output for the **19** and **29** quoted as 0.25 and 0.40 BHP. Speed range – 10,000 to 15,000 rpm both models. Variations of crankcase finish have been noted on both the 3-bolt **19** and **29** Red Head. Most seem to have a polished or originally shiny case (probably the earlier ones) but examples with the dull grey, vapour blasted finish have also been sighted. "Typhoon" was a favoured name for some big **pre**-production Enya engines, and some production ones as well. The Enya website claims that the first engine to go into "mass production" was the Typhoon 63.	We know practically nothing about the **3-bolt 19**'s history or how it came into being. We ***do*** know what its much larger hand-made ancestors looked like, but the **19** itself is pretty much out of left field. We know it first appeared in Feb. 1950, and that the sand-cast **29** came 2 years later in April 1952. We don't know if a factory instruction sheet in either English ***or*** Japanese was ever printed solely for the 19 (before the 29's release) or whether the first one covered both models. The former seems more logical. As all subsequent **19** models were numbered sequentially from 2 – 6, the 3-bolt then must be regarded as a 400**I** but it was never designated as such by the factory. Just to muddy the waters further, they dubbed the (much) later 19X a Model 4**I0I**.

Sand-cast 19 3 bolt front housing	Pat King	Pat's research shows that there were at least 3 variants of the first **19**. In chronological order, these are – (# 1) 7 fin head, ***round*** intake port in shaft, ***no*** anodizing (plain alloy head). (# 2) 7 fin head, ***rectangular*** intake port, ***red*** anodised head & prop driver. (# 3) 8 fin head, ***rectangular*** intake port, ***red*** anodised head & prop driver. I can find no mention in ***any*** modelling magazine specifically of the 3-bolt.	As you might expect from a fledgling manufacturer of any mechanical item, running changes and minor alterations (all done in the name of improvement) meant that there was some degree of variability in the initial finished product, and Enya was no different with their **19**. Both heads have a perfectly flat combustion area, with no groove for piston baffle. Also there is no threaded bronze insert in the head as yet for the glow plug. Some heads (both 7 & 8 fin) have a bevel on the outer sides, and some have straight sides (both sighted).

19 Model 4002 Die-Cast (1st version) **29 sand-cast**	1953 leaflet, clearly aimed at promoting Enya products in the Western world	Both engines have red anodized prop drivers and heads. No mention yet of the die-cast 29 ***or*** the 63,although the latter was definitely in (limited) production at this time. (In a later 1958 MAN article, Chinn suggests 1952 as the initial appearance of the glow 63). The **29** illustrated is still the **sand-cast** Red Head 29, but the **19** shown does have the new **die-cast** 4002 case.	Seems to suggest that the first ***die***-cast (also the first "mass" produced) Enya ***was*** the 19 (this is confirmed by Chinn's 1976 statement above) and that it preceded the die-cast 29 by a period of time sufficient to justify the production of this leaflet. Makes perfect sense for them to have taken on the die-cast models one at a time - dies are costly and tricky, and they were also building their new factory at this time! The date of 1953 is suggested by the fact that they very likely timed their new die-cast 29 engine to coincide with the opening of the new factory. I suspect that this very early die-cast **19** with flat-topped head fins was produced alongside the sand-cast 29 Red Head and is the elusive red-headed Model 4002 we have heard about, further that it dates from mid-1953. The non-flex NVA (brass thimble & knob with wire extension) also ties this in. Both main castings on the 19 now vapour blasted dull grey (as on the 29) and with provision for an optional radial mount.
19 Model 4002 Die-Cast (1st version with red, 8 fin head & red prop driver – flex needle valve soldered spring)	Confirmed sighting! An example listed on eBay mid April 2009 and again in August	The **19** is a completely fresh design, featuring a 4 bolt front housing, oval exhaust stack, but initially fitted with an interim (left over from the 3-bolt ?) sand-cast, 8 fin head, anodized red. Both the 19 & 29 illustrated still have the rigid NVA at this stage. It seems highly probable (from reports emanating from returning US servicemen) that Enya's were sold in Japanese hobby shops un-boxed, at least in the early days. The "Rising Sun" box is the earliest we know of.	

19 Model 4002 Die-Cast (2nd version with die-cast head and plain alloy prop driver) **29 Model 5002 Die-Cast**	Circa early 1954 instruction leaflet which came with Adrian Duncan's own NIB Enya 19 Model 4002 in the early box marked "*New Enya 19*"	***Both*** models are now die-cast and have tall but rounded head fins, with no anodizing. The **19** has ditched the flat top head but retains its oval exhaust stack, and both now with flexible needles (with spring soldered to thimble). The 63 is still missing, with no sign of the 09 yet either, but as we know the latter was released in May 1954, this sheet must date from either very early 1954 or maybe even late 1953, as only the **19** and **29** are included.	It would appear that the factory did not attempt to sell the **63** in Western countries, at least at the outset - like the previous one, this English language instruction sheet only mentions the 19 and 29 models. The die-cast **29** has now appeared, distinguished by its eye catching "airfoil" shaped exhaust stack, and joins its smaller relative, presumably after the new factory opened in Oct. 1953. The previously rigid needle valve has gone. We don't know exactly which version of the **29** came first – the shorter or longer exhaust model (see below).

****** The longer exhaust stack is 38.5 mm long – shorter one 36.0 mm long (both 8.5 mm deep), also
apparent are slight differences in the casting of the letters and numbers. As well, the bypass bulge protrudes out further, with a larger radius curve at the top, on the "short" exhaust engine. The two differing Model **5002** 29's were documented and described by Mr. Akira Fujimuro in a Japanese magazine. It would seem probable that the shorter exhaust 29 was the first to arrive, as some basic geometrical flaws have been discovered in the area of the L.H. mount lug. The longer exhaust version does not have these problems, so it seems as if the factory modified the case die mainly on the L.H. side (possibly also explaining the slightly different contours on the bypass). Of course, the converse may be true – they may have ***had*** a nice straight crankcase, until they started altering the dies. As for the longer exhaust, it too may have been the result of an effort to resolve casting problems in that area (larger plug = less breakages), especially within the stack itself at the extreme rear, the area to benefit most from enlargement. Another quite plausible reason is that, in his March 1955 appraisal of the Model **5002**, E.C. (Ted) Martin in MAN states (when comparing the Enya to a McCoy 29 Sportsman)…." The exhaust stack is smaller and less efficient." As we shall see later, the Enya factory took these small criticisms very seriously. I have examples of both types, and by holding each one at the same angle, some very slight but discernible differences in the profile at the rear of the bypass passage appear. It would thus seem likely that the alteration to the casting die occurred after Saburo read Ted Martin's article, probably around the second half of 1955. The **5002** was a favourite with US Servicemen stationed in Japan, and they sold for $3.95 on the army bases, cheap enough to "throw away" rather than repair. The Mr. Akira Fujimuro mentioned above was (and still is) a prominent Japanese modeller whose speciality was building engines for use in C/L Speed. A one-time employee at Enya, he produced ball bearing racing versions of both the Enya 15 & 29. With regard to the new flexible spring NVA fitted to the early 19 4-bolts, it would seem that an interim version of those also appeared. The very first ones apparently had softer springs, and were much more "bendy", as well, the plating appeared to be a duller (cadmium?) finish, and the tension clip was a different design also, to what appeared later.

63 Typhoon glow with 6 bolt front bearing housing	"Rising Sun" box from Adrian's own NIB 1954 example Serial # 6615, from which the papers are unfortunately missing	This English language box is date-stamped April 21, 1954 over the "Rising Sun" **63** label. This exact same date appears on the box lid of Bob's **63** s/n 6591, so it would seem these were Factory applied shipping dates for that batch.	This affirms that the **63** was definitely in production and now being exported to Western markets during the first half of 1954. This particular example was NOS from an American distributor. Only the production **63** & **60** engines had the 6 bolt front housing.
19 Model 4002 (2nd version)	Article *"How Much Performance"* Model Aircraft Sept. 1954	Just a photo with a caption "A new engine of high performance from Japan." Factory quoted the max. power as being 0.30 HP (up 0.05 on the 3-bolt) with max. RPM increased to 16,000.	This is the first ever ***mention*** of Enya, by Chinn in the modelling Press. Certainly the only mention of ***any*** Japanese engine in his June 1953 M.A.N article "World-Wide Engine Round-Up" was of the OS 29.
29 Model 5002	*"World News"* Aero-Modeller Nov. 1954	Just a single photo of a C/L stunter with an Enya **29**, also, in text "Most popular (in Korea) and less troublesome Jap motors are the Enya's, and our correspondent informs us that over a hundred of these motors could be seen in one model shop display in Tokyo."	First known mention in Aero-Modeller mag. Demand must have been good even then, having already earned a reputation for reliability and strength, so they started off well! Both the 19 & 29 have "Made in Japan" on L.H. mount lug edge, and come in small boxes stating "New 19" & "New 29", same as 09.

09 Model 300I, 19 Model 4002, 29 Model 5002, 60, 63	Enya instruction sheet, circa late 1954 came with a NIB Model 4002 19 in the later "Rising Sun" box	The smallest of Enya's (the 09) released in May 1954 has now appeared. The **60** has also now been added, as well the **19** 4002 and **29** 5002 are both still on offer. The **09** is distinguished by its huge rectangular exhaust stack, rounded head fins and a short rigid NVA. It is a high quality little engine, being basically a scaled down version of the bigger engines. Like the 19, the 09 came with an optional radial mount. Chinn was to later report that a manufacturer of model engine fuel used a 09 as a test mule in the UK, flogging it "mercilessly" at speeds in excess of 20,000 rpm.	A 6-bolt is depicted here with the dual designation 60 & 63 but only the specifications for the newer **60** are listed, indicating maybe that the 63 was in the process of being phased out. It now looks as if the basically identical **60** & **63** models might have been offered concurrently for a short period of time, with the more "familiar" (and Class C legal) 60 size becoming the main "export" model and eventually displacing the 63. It's interesting to note that Peter Chinn did not describe the Enya 09 until his *"Latest Engine News",* in the Sept. 1959 issue of Model Aircraft. This was more than ***FIVE*** years after its introduction, and at least **3** years after he first learned of it! Note that the new **09** is a Model **300I**.
19 Model 4002	Article in Model Aircraft *"Account Rendered 1954"* Feb. 1955 issue	Peter Chinn described the oval exhaust Enya **19** Model 4002 (2nd version) stating "It is one of the nicest handling motors we have tried for a long time." This was the first description of an Enya by Chinn in the UK modelling press. Setting the Industry standard for years to come, this new Enya fitted with a top notch flexible NVA, the other high quality touch being the brass threaded insert for the glow plug.	The definitive **4002** cylinder head (die-cast, no anodizing & fins higher at the front) has now arrived. From this time onwards, P.G.F. Chinn was a consistent advocate of Enya engines, although at this early stage he had not established the rapport with Saburo that he would in later decades. At this point in the proceedings, may I point out that just about ***all*** our information comes from the late Peter Chinn, sourced from his many excellent model engine articles.

Enya 19 3.2cc GP Engine The **Model 4002** but this fact not mentioned	Model Aircraft *Engine Tests* No.71 March, 1955 Test presumably done by P.G.F. Chinn, although no actual mention of author. The cut-away drawing done by a K.E. Carter	Peter Chinn tested the **19** model described in the previous issue. Very positive test! Again, no mention of a 15 model, ***or*** the previous 3-bolt 19 for that matter. Surely, if Chinn had known about the 3-bolt, he would have mentioned the change to a 4 bolt front housing. He was most probably writing this MA article about 6 months before he heard of the 15. Strange though, that he never mentioned the 19 3-bolt until at least 2 decades later, and even then, not remarking on its most unusual aspect.	The first ever Engine Test of an Enya in a UK magazine. Like all reviewers of the day, Chinn seemed a little reluctant to give this new product from Nippon an assessment of unequivocal praise, "The main bearing surfaces on the test unit were not quite as accurate or as perfectly finished as would be expected on a modern high quality *American* engine…" Still, it started very easily, was quite robust in construction, and it performed well, giving a max power output of 0.31 BHP @ 13,800 RPM. For C/L stunt work, Chinn recommended a slightly trimmed 9 x 5 prop.
29 Model 5002	*"Import Review"* MAN March 1955 Author E.C. Martin	The man who designed the 3.5BB Amco had this to say - "there is no evidence of grinding on any component, all fits having been achieved by ***meticulous lathework***, and probably a touch of emery cloth." (In his 1959 test of the 29-IIIB, Ron Warring noted that the sharp edges on the outside of the cylinder liner had been removed with a file). Eureka ran a small advert in this same issue, listing the "new Enya Typhoon" 19 for $10.95, or 29 for $13.95.	Only 10 years since the War ended, so the writer needed to tread very carefully, but he was obviously very impressed with the Enya **29**. Ted Martin tried to disguise his enthusiasm for the Enya by stating that it copied a lot of features from American made engines, saying "In case these comparisons offend anybody, let us point out that imitation is the finest form of flattery". Regardless, it was "first class" had "lots of power" and "is well finished." Although, "lighter and less sturdy" than a McCoy 29 Sportsman!!

19, 29 and 63	*"International Engine Review"* M.A. May 1955	Full page listing of engines available at that point in time – only three Enya's. We now know that an instruction sheet specific to the **63 was** printed, on which the Serial # and build date were both stamped. **63** statistics are as follows – Bore & Stroke 24.5 X 22mm, Capacity 10.4 cc (0.6329 cu. in.), Max power 1 HP. The slightly later 60 outnumbered the 63 by 5 to 1.	Shows that only the **63** (and not the 60) were on the *western* radar at that stage, Chinn stating that data was current as at March 1st 1955. **NB** this date is important, as it gives us some idea of the time between writing and printing – more on this later. The Japanese language **63** instruction sheet came with a tear-off segment for the factory 1 year guarantee. **63** made from massively thick & strong sand castings and with a 3 oz. crankshaft!
09 Model 300I, 19 Model 4002 29 Model 5002, 36 Model 500I, Typhoon 63, 60	Enya catalogue sheet, circa early to mid 1955	The elusive Enya **36** is mentioned here for the first time, but not as yet pictured (all specs given except for weight) so it may have been still in the latter stages of development. The **63** and **60** are both still mentioned, as are the streamlined exhaust 19 and 29 models. The first 15 glow must have been very close to release (in Japan anyway) at this point in time. The **09** and **19** models are both depicted with their accessory radial mounts rarely seen outside of Japan. Backplate holes pre-tapped for the radial mounts, but later models would just have indents.	The **36** being listed seems to date this sheet to the first half of 1955. This engine was only produced for a short period, which explains its status, alongside the later 29 Racing Special and the 3-bolt 19 as one of the three rarest, air cooled, production Enyas of all time. The 6-bolt **63**, and later **60**, share a few unique aspects, which set them apart from all other ***production*** Enya's. They only ever used sand castings during their 15 years of manufacture, and were the only Enya's to be Factory Serial Numbered. As well, the shaft was of a two piece construction utilising a screw-in prop stud. The **63** & **60** are identical, apart from a 0.5mm bore difference.

29 Model 5002	*"Discourse on 2.5's"* M.A. June 1955	Chinn's first mention of an Enya **29** (along with 2 photo's), and specifically dating the arrival of his example as being Feb. 1955, giving him only 1 month to include it in his "International Engine Review" tabled above. "Like the 19, it is a sturdily built engine, nicely finished, which handles well and has a useful performance."	As no mention was made of a preceding 29, we can only assume that Peter was not aware of either the red head sand-cast 29 ***or*** 19 (3 bolt) at that point in time. It would seem that these two early Enya's may only have been brought to the West by returning US servicemen but never marketed there, although we know that an English language instruction sheet was printed.
This quote from Hayes & District M.A.C. (Great Britain) dated Sept. 1955 – "The club was much interested recently by the two Japanese engines brought along by a prospective member. One, an **Enya 63**, was a beautifully engineered 10 c.c. plain bearing glow-plug, costing only 48s. 6d. new, while the other, an **OS 29** cost only 23 shillings, although it is less well put together."			
19 Model 4002, 29 Model 5002	Article in M/A, September 1955, entitled "*Progress in Japan*"	Peter Chinn reviewed the development effort by all current Japanese engine manufacturers as at mid 1955. No mention of any Enya 15, although the then current **19** and **29** models are included. It was in this article that the new official rules for engine capacity in Japan were noted, no doubt explaining why the 63 had its bore reduced by 0.5 mm to become a 60. The **36** must have first appeared in Japan only a few months before this article was written in mid 1955.	Although later statements by Chinn confirm that the 15 glow appeared in Japan in early 1955, he remained unaware of its existence at that time. We now know for a fact that Chinn was unaware of ***any*** Japanese 2.5 glow until he received a Mamiya and Fuji 15 in Feb. 1955. He listed the Fuji in his May '55 table as being the "First Japanese International 2.5cc class engine." Only a month or so later, he would be evaluating an example of the first OS 15 Max I, sent direct to him by the OS firm, but another year would pass before he heard news of the new Enya 15 glow!

19 Model 4003	"*Logging the Motor Mart*", Flying Models, December 1955	Depicts an Enya **19-III** fitted with a 4002 head, so yet another example of using up old parts on new engines! At this stage, there's no other evidence that the **4003** had yet appeared! No mention of any other Enya models. This appears to be the earliest reference to Enya in a US magazine ***other*** than Model Airplane News. A huge Eureka model of the B36 with **six** Enya 19's took 3rd place in C/L scale at the July 1955 US Nats – possibly the first official Contest appearance by Enya engines in the US.	Seems to indicate that the switch to the 4003 from the 4002 took place in stages, with the fully developed 4003 model yet to appear as of late 1955. It probably showed up right at the end of 1955 or perhaps in early 1956. The 19-III's official introduction date has, in fact, been generally attributed in the past to early 1956 (Chinn was to state this at least three times in his articles – in 1957, 1968 and 1974, so it can be regarded as fact). The latterly famous and familiar slogan of "Hand Lapped" was not in use at this early stage. MRC seems to have created that when they took over the US sales.
19-III Model 4003	eBay listing Jan. 2009	Shows a near new **4003** with a 4002 head exactly as mentioned above!	Very few of these "hybrid" engines remain, becoming in themselves, a collectors item

** From our cataloguing of these **Serial #'s** (78 so far), it would appear that the factory started off at
6000 for the **Enya 63**, and 7000 with the introduction of the **60**. The lowest # for a 63 (that we know of) is SN 6014, the highest SN 6928 – for the 60, numbers are # 7224 & # 11635 respectively, although they almost certainly went above the 12000 numbers, but un-stamped. Implication is that only 1000 63's were ever produced, and around 5000 of the 60's. With regard to the very rare 60 Marine, we have only been able to catalogue five Serial #'s to date (June 2009) and these are – SN 10111, 10407, 10530, 11463 & 11478. This suggests that the sand cast 60 Marine must have only been produced in very small batches, circa 1961 to 1963. In June 2009, a NIB Enya 63 appeared on eBay, confirming that the factory ***did*** print a 6-bolt specific instruction sheet. More importantly, stamped on that sheet was the build date of the engine (1954 – 4 – 9) which ties it in to the particular Serial # of 6591. It would thus appear that Enya 63 # 6591 was manufactured on the 9th of April 1954, and both it and Adrian's 63 # 6615 were shipped out the factory door, 12 days later on 21st April 1954. Thus, using ***rough*** calculations, it took the factory about 18 months to make about 500 (or half the total) of the 63's, or about 1 per day on average for a 6 day working week. If we combine all this with information mentioned elsewhere, it would seem to confirm Adrian's theory that the 60 must have entered production fairly early in the 63's manufacturing period, and thus giving more credence to the Serial Numbering system used for the two sizes of 6 bolts. Also supporting this is the shape of the prop driver, which would have been standardised with the arrival of the 60 (using our Serial # list for the 63's, this appears to have occurred about # 6200). Note that my own 63 is about halfway through the production span, and has the later 60 style prop drive. So, if the 63 started life in the latter part of 1952, was followed by the 60 after about 200 63's were made, this would imply that by approx. the end of 1955 the total run of 63's (1,000) would have been built. All this would now seem to fit reasonably well with Chinn's Nov. 1956 statement in M.A.N. that "The Enya .63 is the biggest Japanese motor in ***current*** production." Taking into account editorial deadlines and the snail pace with which news travelled back then, this may only reflect Chinn's knowledge in early 1956, or possibly even, late 1955. This same article reveals that he was unaware of the ***60*** at the time of writing (around the middle of 1956), even though the 60 was being listed by the factory in late 1954! The 63 was still being *mentioned* alongside the 60 (with regard to the 12 month Guarantee, but only stats. for the 60 given) on factory instruction sheets printed during 1956, the same ones depicting the elusive 36. We know too, that the factory must have had a surplus of 63 boxes to use up, as 60 #'s 7981 (my own), 8182 and 8923 were all packed in boxes with a "60" sticker over the printed "63" on the lid, so considering all the facts, I think we can safely assume that the transition from 63 to 60 was a fairly protracted affair. The instruction sheet with # 8182 depicts production engines as at early 1959, my slightly earlier one still showing the first 09, so this fact ties those two Serial numbers into a pretty secure time frame. Using this information suggests that by the end of 1958, only a little over 1000 of the 60's had been produced. This does not fit exactly with Peter Chinn's later statement that 3,200 units (combined 63 & 60 size) were made between mid 1952 and mid 1958, but one possible and simple explanation for this discrepancy is that the engines were manufactured at a considerably earlier date, before they were actually shipped out to the distributors worldwide, with the boxes now containing the latest printed spec sheets (note that even 4 years earlier, there was almost a fortnight between manufacture of my 63, and shipping). Enya always regarded the 60 as their flagship, and apparently, special care was always taken when assembling the 60 regardless of the Model, but even in the 1950's, demand for the biggies must have been fairly minimal and erratic at best. They probably only made them in small batches when time allowed, and always had a reserve stock of completed engines on hand. In July 2009, a new Enya 6-bolt 60 appeared on eBay, with no Serial number at all. Several other "blank" engines have been sighted over the years, and I believe these to be late production units (circa 1964), the factory seemingly losing interest in stamping the numbers on the remaining few of an outdated engine which was about to be replaced by an all new model during 1965. The application of simple mathematics tells us that if the sand-cast 60 was manufactured from mid 1953 to mid 1964, then during that

09 Model 300I, 15 Model 3I0I, 19-III Model 4003, 29 Model 5002, 36 Model 500I, 60	Enya factory sheet supplied with NIB 15 glow (very first model with 2mm longer shaft), circa early to mid 1956 This sheet with added colour, red & yellow now!	The **15** glow is now included, naturally! The **36** is actually illustrated in this one - the 35 has not yet arrived on the scene. Most significantly the illustrated 19 model is now the **4003**, ***but*** the illustrated **29** model remains the 5002! The 63 no longer mentioned in the stats, but still is in the ***Guarantee***. The 15 Diesel was probably in the hands of Japanese aeromodellers even as this sheet was going out the door. Both the 09 & 15 (plus the later 15-IB) had conventional bypass ports cut ***through*** the cylinder liner, as per the larger Enya's. Later 09 & 15's with grooved liner.	The **15** glow finally arrived on the US market in 1956, a year after its introduction. It also appears that the 19-III, being introduced in early '56 was well ***in advance*** of the 29-III Model 5I03. This parallels the earlier situation with the release of the 19-II Model 4002 while the old 29 Red Head was still in production. This information consistent with later sources, which date the introduction of the 29-III to the latter part of 1956. This sheet also dates the disappearance of the 63 to sometime in the first half of 1956. Unless the factory forgot to include this sheet with Chinn's 15 glow, he should have been aware of both the 36 and 60 at this point in time.
The decision by Enya to make a **36** size engine probably the result of rival OS releasing their 36 in 1953 (apparently, around this time, Fuji had a 36 as well), specifically for distribution in the US by the (Bill) Atwood Company. One theory on why the **36** was so short lived is – during 1955, it was discovered that quite a few 35 size engines in the States actually displaced more than the 0.350 cu. in. limit set by the AMA. As an example (when discussing this anomaly) Chinn revealed (in MAN April 1956) that both the FOX 35 and Sabre 35 were actually 0.3519 cu. in., the K&B Torpedo 35 was 0.3529 cu. in., and the OS Max 1 35 was at 0.3555 cu. in. Possibly these discrepancies in "pushing the boundaries" were small enough to overlook initially, but eventually perhaps it was thought wise to curb this trend of ever increasing illegal capacity, thus Enya had to more or less scrap their 36 immediately. One other theory is, the capacity was reduced to comply with a 0.35 cu. in. limit on C/L Combat engines, yet another that maybe OS were confused in the first place by the 0.349 cu. in. McCoy **36**.			
09 Model 300I, 15 Model 3I0I, 19-III Model 4003, 29-III Model 5I03, 35 Model 500I, 60	Enya factory sheet circa mid 1956	First factory listing for both the sensational new **29-III** and the **35** Model **500I**, but the 15 Diesel is ***not*** yet listed. This sheet was probably printed only a couple of months after the one above, indicating fairly accurately when the 29-III supplanted the old "airfoil exhaust" 29. The **36** must have only been in production for little more than a year.	Implies the 29-III beat the 15 Diesel onto the market, but as we know that Saburo may have held the 15D back 6 months or so before releasing it for export, this would seem unlikely. Either way, the **35** Model 500I ***has*** arrived, replacing the **36**. Chinn obviously did not see this sheet before writing his *"Made in Japan"* article listed below, but from this point on, he would be much better informed.

15 Model 3I0I	*"Latest Engine News"*, M/A, September 1956	Chinn (finally and at long last) describes the 15 glow, citing it as "new" & Enya's "latest model". Also notes that the (first) 15 Diesel is undergoing development in Japan at this time. Confirms that the 19 Model 40**03** has now replaced the old Model 40**02**. Both the new **19** & **15** appear to be scaled down versions of the 35, the 19 now with a rectangular exhaust stack and flat-topped head fins.	A rather belated comment, but it confirms that Chinn was now starting to keep pace with the latest Enya engine developments. This article would seem to date the "official" introduction of the **19-III** authoritatively to the first part of 1956. Also confirms that the 15D-I was on track for its late 1956 launch. Confirms the mid 1956 arrival date on the export market for the 15 glow, a year after release in Japan.
09, 19, 29, 63	*"Made in Japan"* MAN Nov. 1956	Only these 4 Enya's appear in the listings of Japanese manufactured engines. A photo of the 29 Model 5002 is shown and described as "one of the more rugged, well- built .29's from Tokyo." As well, a 3-view sketch of the Enya 19 4002 (2nd version) is shown. The earlier Enya 63's employed a differently profiled prop driver, than was seen on the later 63 & 60's. Whereas the later ones had more the classic Enya shape, the first 63's had a single concave curve, ending in a sharp edge behind the prop. Both **63** & **60** came fitted with a token bolt-on exhaust extension, or "duct" as someone said.	It would appear that this article was written by Chinn a lot earlier than the one above for Model Aircraft ! He must have only learnt of the 15 after writing the MAN article. If we assume a 2 month editorial time lag for the British publication (which is confirmed for the 1955 article mentioned above) and a 4 month one for the US, that would mean he first heard of the 15 glow around July 1956, which pretty much fits in with everything else we know. Chinn, being the English gentleman that we know he was, obviously reported back to Saburo after he actually tested the first Enya 15, that it wasn't quite up to scratch. Further improvement was needed!

19 Model 4003	*"Import Review"* MAN Jan. 1957 P.G.F. Chinn	In US speak, Peter Chinn described the new **19-III** as "hopped-up", having all new castings, new crankshaft and a revised liner, but retaining the old (4002) piston & rod. Crank has induction port "the biggest yet seen on a 19" giving an induction period of 225 degrees of crank angle, 40 degrees more than the old Model 4002. Factory quoted the BHP for the 19-III @ 0.35	All the Enya engines now come with a multi-purpose spanner included in the box. Along with the 15, 36/35 & 60 from this same era, the new 19 features the long venturi, set at a low angle. The **4003** 19 is an excellent example of Saburo's quest for constant performance improvement in his engines, although up to this point he seems to have been selective in what engines he wanted Chinn to tell the World about.
29 Model 5I03 **15 Diesel**	*"Points East"* Model Aircraft Feb. 1957 P.G.F. Chinn	Chinn describes both the **29-III** and first **15 Diesel**, the latter in more detail than the former. He says the 15D "has only just been put on the market in Japan." His example (the first in England) had arrived "by Air" just days before he wrote the actual article, so he had a 15D in his hands no later than Dec. 1956, 5 months after he had first heard about it. Chinn states that only the NVA is common to both the 15D and the 15 glow. He emphasizes that the new Diesel is much more heavily built than the "already quite robust glowplug model." The first 15 Diesel fitted only with slotted, cheese head screws and, unlike the 15D-II, did ***not*** have a chrome plated bore.	Along with the two Enya **15D** engines, Saburo sent a note stating that he believed that the new scavenging system adopted "was very efficient", and that he had previously recorded a max. torque of 1.7 to 1.8 kg. cm., which equated to 23.6 to 25 oz. in. Saburo claimed a maximum power output of 0.28 BHP @ 13,000 RPM (Typically, this claim proved to be a little conservative – Chinn managed 0.298 BHP @ 14,700 RPM). Of the 29-**III**, it was simply said that it was "an improved version of the Model **5002** Enya 29 that has been one of the best 5cc Japanese motors of recent years." No mention yet of the 35, even though it must have been around (in Japan at least) for a year at this stage.

15 Model 3I0I	Article entitled *"Import Review"*, MAN, March, 1957	Chinn belatedly noted the very first Enya **15** glow, which he described as "recently introduced". His praise for the Japanese made product now slowly increasing with each article, mirroring the gradual lessening of residual hostility in the US towards Japan. From a US reviewer, this didn't finally occur until June 1962 when American Modeler gave a glowing account of the 45 "Baldy." This is in stark contrast to the Editors Note at the beginning of a Nov. 1956 Japanese engine article - "These articles definitely do not suggest that the reader buy a foreign engine in preference to one made in this country." This comment no doubt, in deference to the US manufacturers who spent big $$$ on advertising in their magazine.	Even early 19***56*** is stretching the term *"recently".* Chinn's date must refer to the engine's first appearance on the export market rather than its introduction. In any case, this announcement was already a little out of date, since the 15-IB had been introduced by this time, according to a later Peter Chinn article. He may not have been aware of this at the time when he wrote this article. He seems to have remained behind the times as far as the 15, 36/35 and 60 were concerned, but that situation was about to change, for he was, by now, on very good terms with Saburo and the brothers Enya. He was to later (on a personal level) report that they enjoyed tinkering with their BMW & Moto-Guzzi motorcycles, so this gives a clue to the new found affluence at Enya!
15 Diesel Mk. I	*"Foreign Notes"* feature in MAN, March, 1957	Chinn noted the recent arrival of the Series **I** version of the 15 Diesel. The **15D** became the first Enya to ***not*** have a bolt-on front housing & thus a removable backplate as well. The early 15D's had a 5mm shaft thread, but from the end of 1957 this increased to 6mm.	Consistent with this engine having arrived on the scene in late 1956, as generally accepted (In his *"Engines Only"* column in the March 1957 issue of Model Aircraft, Chinn confirmed that 4 new Enya's appeared during the year of 1956 – the 15 both in Diesel and glow, the 19 and the 29, the latter two in their third Models).

15 Diesel Mk. I	*"Engine Tests"* M.A. April 1957	Chinn received 2 **15D**'s direct from Saburo, four months prior to this test being published – one with the dual NVA. He ***did*** run the latter, but found the exhaust too oily when on the low speed setting. The "2 Speed" or Hi-Lo control idea was an updated relic from the early spark ignition days, requiring two separate NVA's and a special fuel tank with a built-in escapement. Complex, heavy and inefficient!	With a single NVA fitted, the test **15D** revealed a performance exceeding that of almost every other 2.5cc Diesel with only the Mk. III Oliver Tiger having a slight edge. Saburo seems to have been too busy getting the 15D & 29-III onto the market, to tell Chinn about the more mundane engines like the 36,35 & 63. There is no doubt that his 2 newer engines would have given a tremendous boost to the Enya Company.
29-III Model 5I03	*"Motor Mart"* Aero-Modeller April 1957	Just a single photo with the caption, "Among new series of outstanding Enya engines is the new **29-III** called **Super Typhoon**."	Just about the first formal recognition by Aero-Modeller of an Enya engine, but it is unclear if Peter Chinn or Ron Warring wrote the Motor Mart column.
15-D Mk. I and **15-IB Model 3I0I**	*"Motors of the Moment"* M/A June 1957	Peter Chinn describes the impact that the innovative 15D had on other manufacturers (eg. MVVS and OS with ***their*** 15 Diesels). And further, "Also for 1957 the Enya company has introduced an improved version of the Enya **15** glowplug model, first marketed ***nearly two years ago.***" This 2nd variant of the 15 **glow** differs in having a 2mm shorter main bearing (28 mm instead of 30 mm previously) indiscernible with the naked eye from the outside, so apart from the different screws used, both 15 glows are identical in appearance.	Chinn admits testing the first 15 glow, but states that the new 15-IB "has a 12 per cent higher peak BHP and a 1,200 RPM higher peaking speed, which firmly place it among the top-liners in the 2.5cc glow plug class." Considering all the facts, it would seem that Chinn was ***not*** aware of the 15 until Saburo sent him an example around mid 1956 (by which time,he had had an example OS Max 15 for at least a year *) for initial evaluation. Only then did he become aware of how long it had actually been around for. * *"Foreign Notes"* M.A.N. Oct. 1955

09, 15-IB, 15D-I, 19-III, 29-III, 35 Model 500I, 60 Typhoon	*"Latest Engine News"*, M/A, September 1957	Chinn described the **29-III** in detail and commented upon its exceptionally high performance. He noted that the **35** had now replaced the earlier **36**, and that the 60 had replaced the earlier 63 (incorrectly printed as 62 - a definite typo!) This is the ***sole*** known reference to the **36** in the modeling media - apart from this, it only appears in the metal (rarely!) and in Enya's 1956 factory literature cited earlier. As well, this is possibly the first mention by Chinn of the **35,** the **36**, and maybe even the **60.** He was seemingly unaware of these engines until about mid 1957. Spraybars now changing from the hex tightening surfaces on the fuel line side, to a round with 2 flats design, the spring on the needle itself not now soldered to the serrated thimble.	Pretty much confirms the previous conclusions. Also confirms the fate of the 36 and 63 models, albeit somewhat after the event. Unfortunately, Chinn gives no dates for the phasing out of the 36 and 63 models (in the case of the latter, I think we can presume that this occurred in early 1956). The new 35 visually identical to the 36, both Model **500I**. Up until the release of the 15 Diesel, Saburo was content to follow established engine design thinking, but with the 15D-I he broke away from convention for the first time, employing unusual and quite advanced porting. Chinn states that Saburo very modestly disclaimed any special credit for the 15D, saying that his first Diesel design was largely a ***compromise***, as so few Japanese modelers were experienced in the handling of Diesels.

15-IB Model 3l0l	*Engine Test* in Model Aircraft Oct. 1957 Author unknown but almost certainly P.G.F. Chinn	Chinn tests the **15-IB**, and he dates the models thus - original 15 "was introduced early in 1955 and production continued through 1956" while he says the 15-IB (initially called the 15-IS) was put into production in "January of this year" (1957). Remarking on the ***original*** 15 glow, Chinn says, "It was a delightful little motor, exceptionally easy starting and possessing those silky, smooth-firing qualities which, difficult to put on paper, nevertheless make the tester's life so much more pleasant." The Enya factory must have started changing from the slotted nickel-plated screws to the Phillips type screws around late 1956 or early 1957, as this is a quoted difference between the first 15 (slotted screws) and the 15-IB (Phillips head). The later engine (15-**IB**) would have been made in greater numbers than the original 15 glow.	Would seem to conclusively date the introduction of the first 2.5cc glow engines ie. **15**, 15-**IS** and 15-**IB**. Chinn hints that he may have been the instigator of a revamp to extract more power from the original 15, as he admits to testing (but not publishing) it in 1956. By this point in time, Ron Draper had won the F/F World Champs in 1956 using an OS Max 15, so everyone now knew what the yardstick was for a 2.5cc "Competition Class" engine. Chinn states that the earlier 15 attained an output of 0.25 BHP @ 13,800 RPM. After factory tweaking, the revised 15-**IB** recorded 0.28 BHP @ a little over 15,000 RPM. Its interesting to note that the man mentioned above (Ron Draper) was reported in MA Oct. 1957 issue as testing a 15D with some "standard modifications," these mainly internal polishing. On an 8 x 3½ Top-Flite prop, the Enya 15 Diesel was tached at 15,800 RPM, as against Ron's own works modified Oliver Tiger III @ 16,000.
15D Mk. I	*Engine Analysis* No. 41 by R.H. Warring Aero-Modeller Nov. 1957	Ron Warring, normally more conservative than Chinn in his engine tests (ie. his BHP figures tend to be much less) says "Outstanding 2.5 diesel from Japan with opposed porting and new design features"…"Workmanship is of the highest order throughout," and "The exhaust note is peculiar, especially running rich and slow, but settles into a healthy roar."	Warring could not find a thing to complain about, "It is beautifully made, full of performance and especially interesting from the porting arrangement." Summary "a truly excellent 2.5cc diesel in all respects, and also a very rugged engine achieved at little or no weight penalty." Max. BHP in this test, 0.252 @ 14,200 RPM as opposed to Chinn's 0.298 BHP @ 14,700 RPM.

29-III Model 5I03 "Super Typhoon"	*"Import Review"* MAN Jan. 1958	Chinn describes the **29-III** as "a thing apart from all other foreign 29's." A bit of time lag here, between first describing this new 29 in the US, and his engine test in Model Aircraft – almost ***2 years*** later! The words "Made in Japan" starting to appear inside the back-plate of all new models, and these not now with the previous stigma of inferior quality attached.	This light & compact engine simply re-wrote the rule book on what a **29** size **plain bearing**, ***non-ringed*** engine was capable of, combining as it did a great power to weight ratio, tremendous torque and all with easy handling. Of the **15D**, Chinn says… "along comes something really brilliant and restores our faith in the model engine industry." And, "at one fell swoop established Japan as a major contender in the contest Diesel field."
15D Mk. I	*"Looking Back"* Highlights of 1957 Model Aircraft	Chinn says this Enya actually first appeared during 1956, but added "was a limited production unit restricted mainly to the Japanese market." At the end of 1957, some detail improvements were added to the **15D** – a superior ball bearing, con-rod bronze bushed at both ends (big end only previously), the shaft thread enlarged to 6mm and the gudgeon pin bosses in the piston were slightly enlarged. The improved crankshaft now made from 85 ton chrome molybdenum steel. Barely 18 months after the first appearance of the 15D at least 2 other makers were busy copying the design.	Our first indication of Enya holding back a new model, rather than exporting it immediately. Parallels the situation with the 15 glow, but again (due to the new rules re. 2.5cc *International Class* engines) Saburo was probably just adopting a cautious approach. The **15D**, radical for its time, has the honor of being the first Enya to really make the World sit-up and take notice. Closely followed as it was by the stunning 29-III, it meant that Saburo and Co. had arrived in a ***big*** way! Chinn admitted that of all the engines he had handled during 1956, the **29-III** was ***the*** most impressive.

60 & 63 Typhoon sand-cast case, 6-bolt front	*"Foreign Notes"* MAN August 1958	Chinn states that "The Enya **60** is not a volume production item and only about **3,200** of this and the earlier **63** model have been made in the last six years." This implies that the **63** entered production in 1952 (more probably later in the year, rather than earlier) and we have yet to disprove that view.	Significant for two reason's – This is the ***FIRST*** time (only one other to follow) that Chinn has ever quoted production figures, and it helps with *our* dating of the 6 bolts, which were numbered on the lug, at the factory. To avoid disturbing the earth's crust, the two 6-bolts should only be run on big props with the minimum possible revs.
Enya 60 Typhoon	*"Big Stuff"* L.E.N. M/A August 1958	Chinn describes the **60** 6-bolt as "a modern general purpose 10 c.c. engine, and one of the sturdiest model motors ever built." The **60** would have been in production for about 4½ years at this stage, and every single time this engine was mentioned by Chinn, he never failed to comment on its great strength and robustness!	Describing both the shaft & rod as "massive", Chinn says "..the engine has bags of power and enough medium speed torque to turn as big a prop as anyone would normally want to use," ie. 14 or 15 inch! Performance of the 60 factory quoted as being the same as the earlier 63.

29-III, 35 Model 500I	*"Latest Engine News"*, M/A, Sept. 1958	Peter Chinn referred once again to the **29-III** and described the **35** in some detail. He drew attention to the fact that Enya's new 35 was not simply a bored-out 29 but basically a totally different design. Saburo Enya obviously intended the 35 for C/L stunt, whilst tailoring the 29-III for speed events. Apart from the numbers cast onto the bypass, the 35 is visually identical to the earlier 36, which dates from 1955, and it would seem that the new 35 was created by the simple expedient of reducing the stroke in the 36 from 0.735 in. to 0.715 in. whilst retaining the 0.794 in. bore size. Previously unknown, two examples of **29-III** have now been documented with a single ***large*** square cornered piston port.	As we know that Chinn knew of the 29-III in late 1956 (but didn't mention any new 35) the comment by Chinn in this article that the 35 was ***"a slightly earlier design"*** seems to contradict the facts. It implies that, even though the 35 must have arrived in early 1956 at the latest, Chinn *didn't know about it* until mid 1957.The **35** Model **500I** described as "one of the most powerful and robust stunt engines currently available." With the new 29 (the first Enya with a square venturi) came a choice of 3 different sizes of plastic venturi inserts. Previously, Enya's came with just one metal insert, which if removed gave more power, but still operated with suction feed. This first version of the 29-III came with a 9 : 1 (H/C) head only, and apparently (until fully run-in) *could* run rough.
From all the foregoing, it seems that (as far as Enya model engines are concerned) a ***lot*** of activity occurred in the two year period from early 1955 to the end of 1956, eg. new models included the 19-III, 29-III Super Typhoon, 15 Diesel, 35, 60, possibly the 36, and one or both of the 15 glows! The point is, there may well have been only a couple of months (or even weeks) between each new model's release onto the market during that short space of time, so its very difficult to pin down the *exact* date for every engine, especially when some of Chinn's dates contradict one another. Confirming the above is Chinn's statement in his "Made in Japan" article (M.A.N. Nov. 1956) when referring to OS and Enya, (***quote***) "One thing that has impressed us with one or two of the bigger Jap manufacturers, is the *speed* with which they get new types into production."			
15-D Mk. I, 60	*"International Models, Inc."* advert M.A.N. Oct. 1958	The earliest Enya advert (post Eureka) that I can find in M.A.N. Mentions a 1-2-3-4 placing for the 15D in Japan contest.	Lists only the 15 Diesel @ $13.50 and 60 @ $22.95 but we know that by early in '58, IMI were selling the entire 7 engine range of Enya's. **
** Around March in 1958, IMI reported that the sales percentage of Enya's sold was thus – the 35 and 29-III both accounted for about 25% each of sales, followed by the 60 on 15%. Both the 19-III and 15 Diesel were at 10% each, while the 15-IB and the 09 accounted for 7.5% each, of sales. IMI weren't the only ones selling Enya's at that stage either – Polks in NYC was another during '58.			

19-III, 29-III, 35, 60	January 1959 advertisement placed in MAN by International Models Inc.	Consistent with other sources for this period as far as the included models go. Otherwise, it adds no new information, apart from the fact that I.M.I. now handling distribution of Enya's in the States. The initials **I.M.I.** stamped on mounting lug of each engine, plus in the box was a "Control Numbered Certificate."	Only the larger model glows are listed in this ad. but we can see by the sales figures quoted above that these were the volume sellers. The USA in 1958 was not a great place to be selling smelly Diesels of foreign make (especially Japanese) so the number of 15D's sold in the US is quite surprising. One wonders if, like the Drone, very few actually got used?
06, 06D, 09-II, 15-IB, 15D-I, 19-III, 29-III, 35, 60	Enya brochure, late 1958 or very early 1959 The same one as this packed with 60 # 8182	The 63 is, by this time of course, long gone. The rear induction, budget priced **06 glow** and **06 Diesel** (aimed squarely at beginners) have been introduced. Enya state this fact on their web site and is supported by press releases, confirming the date of this brochure. The ***shiny*** new **09-II *has*** now arrived, which dates its release (in Japan at least) to maybe even late 1958, a few months prior to the 29-IIIB. The rigid NVA on the new 09 is a different pattern to that found on the first 09, but still nickel-plated. The 29-**III** survived for about 2 years, before it morphed into the 29-III**B**, & ***it*** lasted for a further 6 years before the 29-**IV**.	Consistent with the above advertisement as far as the common inclusions go, confirming the very early 1959 date. The 15-IB was clearly still current at that time, as was the 29-III and the first 15 Diesel. The early 1959 date thus seems pretty secure, as we know that the IIIB version of the 29 arrived in the first half of 1959.The **06** glow is the first Enya to utilize a screw-in cylinder, and using induction by reed valve, it was happy to run in either direction. The slightly later 06 Diesel used a steel con-rod in lieu of the 06 glow's stamped bronze, a heavier shaft and the head was bolt-on, not screwed as on the glow. The new **06** one of the very few "small" Enya engines advertised globally.
15 Diesel Mk.I, 29-IIIB, 06 glow	August 1959 advert in Aussie magazine "Model News"	29-III**B** more tractable than 29-**III**, being fitted with low compression head, and the H/C head optional fit.	Pretty much confirms that the **29-IIIB** was introduced (in Australia at least) in ***early*** 1959.

15 Diesel Mk. I	Same advert as above, Aug. 1959 in "Model News"	Announces a "Record for Model Plane" using a **15D** Enya on 9th April '59 "soared his model to well over 14,000 feet.." This feat achieved by one Colin Stones at Berwick VIC. The 6 ft. wing span model disappeared off the Army's tracking radar at 14,325 feet, still climbing and with 19 minutes worth of fuel still on board! The first Enya 15 Diesel achieved some measure of success in "A" Class Team Racing was fast, but "inconsistent" and "didn't pit well." All these of course, the Olly had in spades. The Oliver though, ***was*** an expensive hand-made work of art.	The **15 Diesel** had a few unusual design aspects and care was needed when re-assembling a dismantled engine. The cylinder head bolts were not dispersed symmetrically (the fore and aft bolts placed closer to the exhaust side), the exhaust bolt itself being longer than the other 3. Also, care was needed to ensure that the piston was installed the right way around, with the skirt cutaway on the bypass side. A very sick 15D resulted if the cutaway was on the (wrong) exhaust side! A nice touch on both models of the 2.5cc Diesel was the steel insert in the cylinder head for the compression adjuster.
15-IB, 15-IB TV, 15-D, 19, 19 TV, 29 TV, 35, 35 TV, 60	"Aero-Modeller" full page, back cover advert. by *Keil-Kraft* Sept. 1959. Depicts both Enya and OS engines	Presumably, the first 09 was never marketed to any degree in the UK, the distributors opting to wait until the new model arrived. This parallels the later situation in the US when MRC, although quietly selling the thing "under the counter" did not waste any money by advertising the old, and soon to be out-dated 60 sand-cast. Here though (in 1959) it is touted as "The only model engine which carries a full 12 months maker's guarantee."	Interesting in that the **15D-I** is actually shown fitted with the twin needle valve set-up, but only listed as the std. C/L model. Apparently, (unlike FOX and K&B) if you wanted the extra needle valve for use in R/C, you had to buy it separately, drill the venturi, and fit it yourself. The prices show that, even though the Enya 15-IB was cheaper than the OS Max-II 15 (by 27/6) the Enya 35 was 15 shillings dearer (not an inconsiderable amount to a schoolboy in 1959) than the OS Max-II 35.
09 Model 300I (first model)	*Latest Engine News* M/A Sept. 1959	Chinn emphasizes the fact that the little 1.61cc engine is virtually a scaled-down version of the bigger Enya engines with "fine quality construction throughout… Performance is at least equal to the very best in the **09** class eg. 13,300 RPM on a Stant 7x4 and handling is first class."	This short review done on an engine that he had known about for 3 years, and with the new model 09-II already on its way from Japan. Also, Chinn admits that this is the last of the then current Enya range to be "dealt with" in his engine columns. Sums it up as "the **09** is a delightful little engine."

29-Series 3 (Chinn's words) **Model 5I03**	*MA Engine Tests* Oct. 1959	Chinn's "Model Aircraft" test of the 29-**III** appears in the same month as Warring's test in Aero-Modeller of the later 29-III**B**! A typo appears in this test when Chinn refers to the preceding 29 as a Model 500**I** (it should be 500**2** of course). The "out of the box" performance of this engine was so good that Chinn initially thought he may have been given a hand picked example, but reports soon began to come in of B Class team racers hitting 118 MPH with these engines.	Chinn mentions that it "was first introduced nearly three years ago," also stating "the most recent examples to leave the factory are now being supplied with two interchangeable cylinder heads" (referring to the III**B**). This would become standard practice for the next 20 years. In this test of the 29-**III** with only the H/C head, Chinn remarks on "the outstandingly high torque developed," with only two other engines at that point in time (McCoy 60 Series 20 & FOX 29R) matching it. Max power 0.69 BHP @ 16,000.
29-IIIB Model 5I03	*Engine Analysis* No. 64 by R.H. Warring Aero-Modeller Oct. 1959	Ron Warring reviewed the 29-III**B**, issuing a glowing accolade for the engine eg, (the Enya) "is a superb power plant in all respects" also that it was "Extremely well engineered," so the World's 2 foremost experts on model engines both agree the 29 is superb.	Warring noted the fact (as did Chinn) that although this engine was capable of high revs, it also had a huge amount of torque, enabling it to turn really large propellers at lower speeds. The factory recommended 1 hour of running before fitting the high compression head.
09-II	*"Latest Engine News"* M/A Dec. 1959 & Feb. 1960	Chinn states "A new model Enya **09** (to be known as the 09-2) will also be available early next year" (1960). No mention yet though, of the 15-II. Two months later, a photo appeared of the 09-II with caption "The new 1.6cc Enya 09-II shortly due for release". To meet editorial deadlines means Chinn knew of the 09-II no later than Oct. 1959. It was not assigned a Model No.	In this same issue that the new **09-II** is announced, a photo is shown of the 15IB ***and*** the old 09 both fitted with the early R/C throttles. This latter combination is rare (only one other photo known) so the factory must have only assembled a handful of 300I TV's before the 09-II arrived. The first 09 by this point in time, had been around for almost six years & was probably sold in small quantities overseas.

06, 06D, 09-II, 15-IB, 15D-I, 19-III, 29-IIIB, 35, 60	Instruction sheet from late 1959 or early 1960 Came with NIB Enya 35 Model 500I	Completely consistent with the previous items. The 29-**III** is now into its second (III**B**) stage of development. However, the 15D-**I** is still on the books, dating this to the latter half of 1959, or possibly early 1960.	This sheet, along with the date of Warring's Test below would seem to confirm that the 29-III**B** appeared in early 1959.The III**B** update was a very minor one, the change only involving slightly taller head fins, the fitted L/C head and provision for a pressure tap in the back.
15D Mk. I	*"Latest Engine News"* M/A Jan. 1960	Due to some continuing shaft failures, the final upgrade (with a "further improved nickel-chrome steel crankshaft") of the **15D** was announced.	As this was the second time the shaft steel had been upgraded to a higher tensile strength, we can only assume that Saburo ***had*** to contend with less than top grade crankshaft material. **

** Just to clarify the situation here – it would appear that in normal everyday use, the **15D-I** gave its owners no grief at all (I think Adrian said that he'd had 7 of them with no shaft breakages, David Owen also stating he'd had no problems). Its possible then, that the problem only arose during extreme competition use by owners who had no mechanical empathy. One theory put forward to explain what breakages that did occur, was that the design was actually "too rigid", possibly meaning the steel used was super hard, but maybe a tad too brittle for the hammering of a Diesel at high rpm. The massive con-rod used certainly would not have cushioned any shock (the gudgeon pin was 1mm thicker than on the 15 glow) and any fractures that did happen were just in front of the crankweb where the shaft was weakest. Even the tester's of the day couldn't quite agree on exactly ***what*** grade of steel Enya used for their crankshaft's, variously describing it as "Heat treated carbon steel", "Hardened alloy steel", "Nickel-chrome steel", or (in the case of the 29 Racing Special) "Chrome Molybdenum steel". I can't speak for the crank material, but I ***can*** with authority on the iron & steel used by Enya in their pistons & cylinders. A full 60 years of 20/20 hindsight tells us that, whatever Saburo ***did*** use for his pistons and liners, no other manufacturer of model engines has ever bettered it. What amazes me is that, right from the early 1950's, the metal must have been just about perfect for pistons and liners, which begs the question "Where (in a country trashed by war) did Enya get it from"? (Perhaps the same place as the ni-crome wire for their first glow plugs – the US Army! And ***that*** could well have been paid for with the Enya cigarette lighters). Their rivals at OS obviously didn't use the same source, their pistons being made from "green" iron, which grew considerably after initial use.

09-II	*Engine Test* "Model Aircraft" Sept.1960 P.G.F. Chinn ***Also*** ***"****Engine Analysis"* Aero-Modeller Nov. 1960 Ron Warring	As well as these 2 tests, Ron Warring also tested the throttle equipped **09-II** for Aero-Modeller in Sept. 1964, noting that "Piston-cylinder fit is extremely good, virtually to diesel standards." Not just the fit either – Chinn compared the new 09-II's performance to the standards then being reached by the leading ***diesel*** 1.5's. Max power 0.176 BHP @ a little over 16,000 RPM.	Both testers agree the **09-II** is an exceptionally good little engine, just ***faultless*** in fact. Unlike its bigger brother, the 15-II, this engine was only ever seen with a shiny case. Chinn was amazed at the way the **09-II** could turn a Frog 6 x 4 prop @ 19,500 RPM, yet still swing a 9 x 6 @ 8,000 RPM! This Diesel like torque at the lower speeds most unusual for a small glow engine, yet at the top end, it was happy to run at speeds approaching 20K.
15-II std. & TV *Shiny polished crankcase*	*Model Aircraft* Sept. 1960 ***Also*** *Model Airplane News* August 1961 ***Also*** *Modell* # 6 1961	As far as we are aware, photographs depicting this rarely seen, shiny variation only ever appeared three times (once each in a US, German and British magazine). The **15-II** in either the shiny or matt grey crankcase was not allocated a Model No, so these jump from 3**I0I** in the preceding 15-IB, to 3**303** in the later 15-**III**, and 33**04** in the even later 15-**IV**. The 15-V then, ***should*** have been the Model 3305, but by that time (40 years later), the novelty had worn off and it too became a Model 3304. The 5 mm shaft thread on the previous 15-**IB** is now 6 mm on the 15-**II**. The new 15 comes with 2 sizes of venturi inserts, the intake tube itself now shorter than before.	Confirms that the factory must have only done a small initial run of these and then probably abandoned for cost reasons, as the **15-II** was intended to compete at a lower price. An English language, full Engine Test of the **15-II** glow was never published, although one ***was*** in a 1961 German magazine (Modell). A brief "mini test" did appear in the May 1966 issue of *"Radio Modeller"*, and in which Chinn states that, "The Enya 15 Series II model was introduced in 1960." As well as the milder Enya's being available with a (crude) throttle valve, even the "hot-rod" 29-IIIB could be bought with one fitted. The 15-II now with provision for a simpler muffler fitting, having 2 indents either end of the exhaust stack for drilling out, as well as 4 indents at the back for radial mounting (3 on the earlier model 15-IB).

60 TV 6-bolt	*"Latest Engine News"*, M/A, November 1960	Chinn drew attention to the TV version of the Enya **60**. At this early stage, all the "R/C" throttles fitted to Enya's were simple rotating barrel type, with the barrels usually made from un-plated brass, & ***heavy*** in the larger sizes	From advertisements in AeroModeller and Model Aircraft, it would seem the TV versions were first available around mid 1959 in the UK. This confirmed by Chinn in MAN Oct. 1959. Actuating arms on the early throttles merely a piece of wire, affixed by lock screw.
15D Mk. II	*"Latest Engine News"* M/A Dec.'60	Chinn says this engine was "just received from the manufacturers." The new 2.5cc Diesel is 1 oz. heavier than the 15D-I, due mainly to the much heavier shaft (which even in the Mk. I version was one of the biggest around) which now had a thickness of 1/10 in. at the induction passage (this being the location of the previous fractures)	Combined with the above mention of the upgraded 15D, it would seem to indicate that the **15D-II** arrived about mid 1960. It wasn't known at the time but this would be the last 2.5cc Enya Diesel to be released for more than 40 years! **15D** now with a single NVA and a bell-mouth venturi top. A nifty but rather heavy steel compression screw locking lever came with the 15D-II.
06, 06 Diesel, 09 with radial mount (called 09-2**), 15-IB** (called 15-II**), 15D-I** (called 15D-II**), 19-III, 29-IIIB, 35 Model 500I** (called 35-II) **60**	Robbe catalogue from Germany, circa 1961 as it shows a mixture of old and newer models, eg. the 29 Racing Special	This leaflet incorrectly shows images of four of the ***old*** models, labeling them as the new and updated ones. Still, we are able to pinpoint the printing date reasonably accurately, simply by cross-referencing the models that are & aren't listed. It becomes easier from 1960 onwards, to chart the various Models simply because of more coverage (both editorial and in advertisements) appearing in the various modeling magazines. The first 09 is depicted here (for only the 2nd time) with TV fitted.	This sheet is interesting for two reasons, in that it shows the 15D Mk. I (an engine designed for optional dual needle valves) fitted with a factory TV - a combination that would not be seen in the metal until May 2009 (eBay). This set-up looks decidedly strange, as with the carb sitting on top of an already long and vertical venturi, the air intake is closer to the top of the cylinder than it is to the crankshaft! This leaflet also shows the ***entire*** 7 models (09 through to 60) fitted with throttle valves. At this point in time, Germany one of Enya's biggest export markets, through Robbe.

06, 06D, 09-II, 15-II, 15D-II, 19-III, 29-III, 35-II, 60	Enya factory sheet, came with NIB 35-**II**	The illustrated engines shown are the ones listed, which date this to around 1960 / 61, ***but*** on the overleaf side, the 35 specifications are for the earlier Model 500I, the 15 is still the IB, the 15D is the Mk. I still, the 29 ***is*** the IIIB but specs. for the III, the 15-D specs. are still for the Mk. I, and the 09-II is still only making the same BHP as the earlier 09-I did. It is likely that quite a few 29 Racing Specials were sold in Germany.	This shows that its no wonder the German's above got it wrong, also proves that the factory was sometimes less than 100% reliable with the information and images shown on ***their*** instruction sheets! Also shows they were very slow to alter data on their factory sheets, as although this must date from around early 1961, the 63 (having been gone for at least 5 years) is still included with the 60 as having a 12 month guarantee. Obviously the factory must have built up a sizeable reserve stock!
15D Mk. II TV	*"Latest Engine News"* M/A March 1961	Chinn announces (with photo) the **Mk. II 15D** in its "throttle equipped version." Unusually for a Diesel, this apparently worked quite well, with safe idling @ 3,000 RPM up to maximum 13,000.	Obviously, all of these newer generation Enya models were available right from the start with optional TV's, as were several of the older models towards the end of their run eg. the 09-I, 15-IB, 19-III and the first 35.
15D Mk. II TV	"Modell" magazine # 4 1961 Engine test in German hobby magazine by Dipl. Ing. Peter Demuth.	Demuth was a qualified engineer but his method of calculating an engines max. BHP was obviously quite different to Chinn's	Enya had a large profile in Germany at this point in time thanks to Robbe. Frequent full page adverts inside front cover of "Modell" magazine.
15-II	"Modell" magazine # 6 1961 Engine test in German hobby magazine by Dipl. Ing. Peter Demuth.	The smallest prop tested on the 15-II (a Frog 6 x 4 toothpick) resulted in a speed of 17,300 RPM! The largest (a heavy Frog 10 x 6) gave 7,500. Recommended best size prop an 8 x 4, which the 15-II turned at 12,900. The test engine in std. C/L form.	The only known test report ever done on the **15-II** glow. The tester remarked on the Enya's high quality & close fits, resulting in a long life, but only after at least a 2 hour break-in. The maximum power quoted at 0,172 PS @ 14,000 RPM, or 2 PS with 30% nitro fuel, is much less than it should be.

15D Mk. II Std. *and* with TV	*"Engine Analysis"* Aero-Modeller March 1961 R. H. Warring	"Performance is way up in the top class – 0.332 B.H.P. @ 15,500 RPM, & Max. torque 27 oz. in. @ 9,000 RPM. Just to help put all this into perspective, only 6 months later Warring tested the PAW 19D "Combat Special". This larger 3.2cc engine only produced 0.015 more BHP @ 500 RPM less than the Mk. II Enya 15 Diesel. Both engines are listed as developing their Max. torque @ 9,000 RPM – the PAW 27.3 oz.in., the Enya only 0.3 oz. in. behind !	The normally staid Warring was highly impressed – "It is extremely well made, with particular attention to accurate fits and finishes," & "obviously an extensively developed engine…" Rather ominously though (from the A Class T/R perspective) he says.." the Enya Mark II is a very easy engine to handle for a racing diesel. The chief characteristic is that a prime through the exhaust is virtually essential for starting.." but that it was "Smooth & consistent at speeds approaching 20,000 rpm." The **15D-II** was a lot of performance for the price.
35-II Model 600I, 15-II glow	*"Latest Engine News"* M/A April 1961	Chinn announces that a new "Mk. **II** Enya **35**, rated at 0.8 BHP is now in production." Also that deliveries of yet another new Enya, the now "low priced" 15-**II**, are under way. Reason for lower price is stated below.	Even though Chinn states that deliveries are under way, he also says that this model (the 15-II) "should be available in the UK in the coming months." This shows the time lag between leaving the factory, and appearing in the shops!
09-II, 15-II, 15D-II 35-II Model 600I	"*Motor Mart*", Aero-Modeller April 1961	Notes that the Series II versions of the 09 and 15 models listed have now been joined by the **35-II**, this latter being purpose designed for later development into the plain bearing 45. Both the 15-**II** & 09-**II** now feature internal bypass ***flutes*** in the very thick steel cylinder liner, meaning no exterior "bulge." This meant no loss of performance, lower production costs, improved rigidity ***and*** better quality!	Seems to date the **35-II** to late 1960 or early 1961. The 15-II and 15D-II appear to date from 1960 and the 09-II from 1959. As the 35-II was intended as the basis for the larger 45 by increasing both the bore & stroke, it (the 35) was as a consequence, just a tad over-engineered which made it a very rugged and tough engine. No parts were carried over from the old Model 500**I** 35, as it was an entirely new design, the bore and stroke changing from 0.794 x 0.715 in. in the older 35, to 0.803 x 0.704 in.

15-D Mk. II	*Engine Test* M/A May 1961 P.G.F. Chinn	The (by now) usual test filled with praise, although mention is made of the problems with the earlier 15D breaking shafts, despite being "oversize," and "generous" in diameter. The shaft diam. now increased to 11.5mm making it "the largest size journal used on any ball bearing 2.5 to date." Technically, the **15D-II** was a superb design with workmanship to match, its max. torque output being the highest of any stock 2.5 Diesel up to 1962. Some had all slotted screws, some had Phillips, and some came with a mix of both (all shiny nickel plated).	The new 15 Diesel now with a shaft "bigger even than the shaft size of some 29's and 35's." Bore is also chrome plated, retaining the Mk.I's unorthodox porting system (Chinn described it "unique loop-scavenged porting). Although an excellent engine with plenty of power (0.34 BHP which matched, if not actually exceeded, both the standard Oliver Tiger III ***and*** the Eta 15) the 15D-II was too overweight, as well as needing a prime to re-start hot, to challenge the Oliver Tigers in Class "A" Team Racing. Disregarding the "little" Enya's, the 15D-II was to be the last Enya to ***not*** have a detachable front end, until the arrival of the 40X, some 18 years later.
06, 06D, 09-II, 15-II, 15D-II, 19-III, 29 Special, 29-IIIB, 35-II, 60	Advert placed by I.M.I. in Jan. 1961, as well as MAN, May 1961	First mention of the **29 Special**, known as the "**Speedy**" in the US, and based on the 29-IIIB. This engine can be easily identified by its low, rectangular FOX 29R type "bathtub" intake, designed for fuel pressure feed. Came with 2 flush fitting alloy venturi inserts atop a heavier front end, with a single rear ball race. As well, two cylinder heads with the exact same compression as fitted to the standard 29-III**B**. Its likely that Akira Fujimuro most probably helped to develop this engine.	In the Oct. 1960 issue of MA, Chinn describes the 29 Special, adding that he had mentioned it "Many months ago" (March 1960 *L.E.N.*), and that it was "Now in production." Special has an iron piston (slightly shorter than the standard 29-III due to larger diam. crank web) running in a chrome-plated bore. The crankshaft itself the most modified item, with a massive increase in induction port area, and with a ¼ X 28 non-metric thread. Quite amazingly, the Special weighed only about one third of an ounce heavier than the standard 29-IIIB (checked on my own 2 examples).

15-II, 15-II TV	*"Latest Engine News"*, M/A, June 1961	Peter Chinn announced the availability of the TV version of the Enya 15-II. The 15-**II** & 09-**II** both initially available with shiny polished cases (a sales experiment?). The 15-II later reverted to the more usual matt finish, but there was no printed differentiation.	Just confirms again that the *standard* version **15-II** was introduced during 1960.Due to the new method of bypass porting (with much thicker liner), on both the 09 & 15, no exterior "bulge" now visible on the LH side, ***but*** the case is now noticeably thicker fore & aft beneath the exhaust stack.
45 Model 600I plain bearing	*"Latest Engine News"* M/A July 1961	Chinn states "Enya will shortly begin production of a .45 cu. in. model in both standard & throttle equipped versions". Both new **6**00I engines have large 4 mm mounting holes and are still unique for that feature.	Confirms that production of the **45** plain bearing "Baldy" almost certainly commenced in 1961. As stated previously we only have two references to Enya Serial Numbers, but I have a NIB 45 with the # 1633122 factory stamped on one lug. Meaning unknown!
45, 45 R/C, 049, 06, 19-IV, 29-IV	*"Latest Engine News"* M/A August 1961	"As was mentioned last month, the new Enya **45** and 45 R/C engines will be released shortly. An Enya 049 is in the offing and will be similar to the existing 06 model. We understand that new Mk. **IV** models of the Enya **19** and **29** are also under development."	This is interesting, in that it shows that Peter Chinn was by now, on such good terms with Saburo Enya, that he knew about the development of the new 19 at least a year before it was released, and at least ***2 years*** before the release of the Model 5224 Enya 29 ! *** See footnotes**
35-II TV Model 600I, 049	*"Latest Engine News"* M/A Nov. 1961	The R/C version of the **35-II** comes fitted with a "complicated throttle carburetor" (containing 18 separate parts) and is illustrated in this issue along with the new 049 reed valve. Like all Enya's from this era, the **35-II** produced a lot of torque (54oz.in. @ 7,000 RPM) to turn big props easily. Unfortunately, the 35-II was never tested in its standard venturi C/L configuration, but for the record the R/C version's max. BHP was listed as 0.52 @ 11,600 RPM on test in (MA) March 1962.	The 35-**II** became possibly the most under-rated Enya of all time, overshadowed as it was by the mighty 45, and then replaced relatively early by the 35-**III** Model 5224. Although both based on a common set of main die castings, the 35-**II** only ever had a cast, finned head. The 45 head machined from solid alloy, flatter underneath and with slightly lower C/R. The **45** had a more heavily counterbalanced shaft than the **35**,the standard C/L 35-II being a fraction *heavier* than the equivalent 45 with finned head, the Baldy 45 a fraction heavier than both.

049, 06, 06D, 09-II, 15-II, 15D-II, 19-III, 29-IIIB, 35-II and 45 Models 600I, 60	I.M.I. Catalogue *c.* first part of 1962	The plain bearing **45** has now appeared, the first Enya in this mid size, and easily identified by its machined alloy head completely devoid of fins The **049** appears for the first time, and like the 06 Diesel, it features reed valve rear induction and comes fitted with a spring starter. The **19-IV** has yet to appear, which it did later in 1962 so this must date from the first part of 1962.	No mention yet of the 29 Racing Special, although it was definitely around at that time. Places the introduction of the 049 in, or before, mid 1962. Likewise the 45 plain bearing "Baldy". Sales of Enya engines in the US now really starting to pick up momentum, eclipsing the UK Germany & Australia. By 1969, ***most*** of the output production by the Enya factory was absorbed by the US & Japan.
35-II TV Model 600I	Model Aircraft March 1962 "*Latest Engine News"* and *Engine Test*	In this MA test, Peter states the **35-II** replaced the old 35 Model 500I "During 1961…with the R/C version available in 1962". This was the first time that an Enya 35 had been tested in any British model magazine, the OS 35 on the other hand, had been tested at least twice previously by Chinn, in 1958 and 1960	This issue of MA contains an extensive description of the **35-II** in the L.E.N column, as well as the actual engine test Like Warring, Chinn remarks on the Enya needing at least a couple of hours running to be fully run-in (he ran it for 3 hours prior to testing). Today no-one would even consider such large props on a 35, yet Chinn found the Enya was happy to turn a 14 x 6 Top-Flite at 6,500 RPM!!
06, 06D, 09-II, 15-II, 15D-II, 19-III, 60	Enya catalogue of their TV models for early 1962	Consistent with the above except that the 049 is missing, the reason being that this smallest of Enya's was never fitted with a throttle. Maybe a throttle did not work well with a reed valve, but a throttle (albeit a crude butterfly) ***was*** fitted to the 06.	These first generation R/C throttles (Enya called them TV for *throttle valve*) crude in the extreme, being basically just a rotating drum (free to turn 360 deg around the jet) with an air hole drilled through, the actuating arm (simply a piece of soft wire) merely opening or closing the hole.

45 Model 600I plain bearing	"*Motor Mart*", Aero-Modeller June 1962 The term "Baldy" is only a slang term. As well, "Speedy" was only coined by MRC in the US for the 29 Racing Special	Announced the Enya **45** TV, now with complex twin needle carb. This was a quantum leap forward in technology from the earlier & crude TV. Ultimately however, although it ***did*** work very well, it proved to be too complicated for the average R/C flyer to operate, as well as probably too costly to manufacture, on top of being incompatible with the factory mufflers seen at a later date. History has shown that this new carb could deliver a performance about a decade ahead of its time, but flyers had enough problems just dealing with the R/C gear back then. 10 years down the track, and it might have been a sensation. (see footnote)	Consistent with the notion that the **45** arrived in early 1962, as previously thought. Interestingly, it would seem at first glance that both the 35-II TV and the 45 "Baldy" TV only ever appeared with the complex twin needle carb, yet we have seen a NIB 35-II TV with the old and simple, rotating barrel type throttle (same as the one on the 60). Another example of using up left over parts, and at the same time solving the problem with muffler fitting. Note the stated time gap above between the release of the std. 35-II & the 35 TV. Was there (as we suspect) a "thick" ***and*** "thin" bald head on the 45 ? **** (see below)** The C/L 45 and 35-II used a split steel venturi insert (under compression), which can be difficult to remove without a special (but easily made) tool.

****** In Ron Warring's *Engine Analysis* of the 45 "Baldy" (Aero Modeller Jan. 1963) the hand drawn diagram of the engine shows the head to have an outer side height of 5 mm. This is borne out by the photo, which clearly shows the fitted Enya glow plug as having its tightening surfaces standing partly proud of the top of the head. Both my two 45's have heads which measure 7 mm in height, so this means the tightening surfaces of the plug are now completely contained within the head recess. We really have no idea why Saburo chose a solid, un-finned cylinder head for the first release 45, but possibly it was an attempt to improve idling by retaining more heat in the head.

Incidentally, do not regard Enya factory brochures as Gospel Truth. I have discovered numerous minor discrepancies within their technical specifications eg. the compression ratio of the Bald Head 45 is normally given as 7 : 1, with the finned head 35 at 7.5 : 1, but on other sheets it is 8 : 1.

049, 06, 06D, 09-II, 15-II TV, 15D-II, 19-III TV, 29-IIIB, 29-III Special (specs. listed, but not illustrated) **35-II, 45** (listed but not depicted) **60**	Enya instruction sheet *c.* mid 1962 This is the standard sheet that came with Bob's own NIB **29 Racing Special** No additional sheet included specific to the Racing 29 NIB examples have appeared on eBay with just the black & white **III** sheet	Maybe the first factory instruction sheet to list the **29 Racing Special**? Consistent with the above sources as far as the common items go. US Speed flyers found the 29 Special had a piston, which grew at a faster rate than the liner did. This would seem to indicate that the chrome plated liner was the cause of the problem yet it worked well in the cooler running 15 Diesel.	No new info other than the continued availability of the 29 Special as of mid 1962 (2 years old at this stage). In his 1963 Global Engine Review, Chinn reported that the Special had "been doing particularly well for Class B team racers in Australia" but competition success seems limited at best. Factory specs quoted an increase in peak power of 0.10 BHP over the std 29-IIIB, with maximum RPM rising to 19,000 (up from 18,000).
06, 06D, 09-II, 15-II, 15D-II,19-III	Enya instruction sheet for TV models, *c.* mid 1962	Consistent with the above as far as the common models go. The omission of the 60 is odd given that Peter Chinn had announced the TV equipped version of that model back in Nov. 1960	The old sand-cast 60 may well have been considered obsolete by that time (which it was), but it continued to be depicted and listed in the factory literature (the G.E.R. too!) right up till 1965, when the 60-II first appeared.
06, 06D, 09-II, 15-II, 15D-II, 19-IV, 29-IIIB Racing Special, 35-II, 60	IMI advertisement in MAN June 1962	This advert includes both the 29-3 Special ("Speedy") and a photo of the ***fabled MARINE version*** of the 6-bolt 60. Oddly, no mention of the 29-IIIB in standard form, but probably just an over sight! With phrases like "Special Valve Control", "New ANTI-STALL" and "whispering idle", this ad was surely created by an imaginative recruit from Detroit (referring, of course, to the new dual needle carburetor).	Confirms that International Models Inc. was still the US Enya distributor at this time. The first appearance here of the 19-**IV** is consistent with Chinn's M/A August 1961 announcement noted above. The 19 Model 400**4** now with cast lug beneath the shaft housing for pressure tap per the 35-II. In that position, the available pressure is "high" (due to the descending piston) rather than "low" (pressure differentiation) when tapped from the back-plate. This change most beneficial in the later 29-**IV**.
Enya 45 (referred to as "R/C Mill from Japan")	American Modeler June 1962 Author unknown but probably Cal Smith	A fairly short review from (for a change) someone other than Peter Chinn! In this article the writer makes the observation that Jap products (once considered to be inferior) were now the equal, or better than those from most other countries.	Apart from (as also noted by Ron Warring) the tendency when new, to kick and run backwards, the tester said "We were impressed not only with performance and workmanship, but especially with the easy starting and smooth running qualities.." 2 – 14,000 RPM on an 11x4.

19-IV Model 4004	*"Latest Engine News"*, M/A, August 1962	Peter Chinn announced the new Enya 19-**IV** with "revised front end with larger crankshaft". Other improvements included modified port areas and timing, bigger volume bypass passage and an improved throttle. When finally tested, the max. power of the TV version was given as 0.27 BHP @ 12,500 RPM.	From all the facts, it would seem that the **19-IV** arrived on the scene in the first half of 1962. It would take Chinn until July 1968 however (***six years later***) before a full test of this 19 was printed. In the February 1966 issue of "Radio Modeller" a very brief "mini test" was published. This engine, like the 09-II, had Diesel like ability to turn large props with ease.
35-II Model 600l	*Motor Mart* Aero-Modeller Dec. 1962	Announces that supplies of the **35-II** had reached Keilkraft (the distributors of Enya engines in the UK) as at Oct.1962. The new 35 described as having a "healthy bark" and its most distinctive feature being a "deep finned head, reminiscent of the Fox 29R."	The retail price of the **35-II** at Christmas in 1962 was listed at 6 Pounds, 15 Shillings and 6 Pence. This was 1 Shilling & 6 Pence cheaper than a new Veco 29, but 16 Shillings dearer than a Merco 35. "This 5.85cc engine is claimed by the manufacturers to have a peak BHP of 0.8."
Enya 45 (This the plain bearing, Model **600l**, with finless head and TV	Aero-Modeller Jan. 1963 *Engine Analysis* No. 103 by R.H. Warring	Warring conducts a brief test of the first **45** TV with solid head, stating that "The throttle works extremely well" although both needle valves "are dangerously near the propeller." Strangely, he also says "Possibly the weakest part of the design is that the mounting holes are relatively close spaced." This maybe an optical illusion due to the large 4mm holes in the lugs?	Despite finding "a fair level of vibration" when running & "liable to kick-back sharply" if flooded, Warring summed up the 45 as "a very good general-purpose radio control engine." Also, that "It is an extremely well made & finished engine, with a lot of attention given to obtaining "optimum" fits and running clearances", but "by no means outstanding in power output." Ron's figures were 0.55 BHP @12,400 RPM.

049, 06, 06D, 09-II, 15-II, 15D-II, 19-IV, 29-IIIB, 29-III Special, 35-II, 45, 60	c. October 1962 "*Global Engine Review*" published in American Modeler Annual for 1963	This was the first year in which the Global Engine Review, edited by Peter Chinn, appeared. Even now (47 years later) it remains almost certainly the single most factual & comprehensive roundup of model engines ever published. These were prepared by Chinn near the end of each year for publication early in the following year.	All told, 12 Enya's are listed as current, including the new 19-**IV** & **049**. All are listed as being available with throttle valves except for the 29-IIIB (a typo - these ***were*** made) the 049 and the 29 Special. Six Enya's are either drawn or photographed, which shows that Chinn definitely had a "soft spot" for Enya even whilst on OS's payroll !
049, 06, 06D, 09-II, 15-II, 19-IV, 29-IIIB, 29-IV, 35-II, 35-III, 45, 60	c. October 1963 "*Global Engine Review*" published in American Modeler Annual for 1964.	2nd edition of the G.E.R. and 10 Enya's are either drawn or photographed (The 29-3 Special being # 1 on the title page). Deadline for this article must have been right in the middle of transition for the 29 & 35 Models, but just *prior* to the axing of the 29 Racing Special	The 29-**IIIB** TV ***is*** now listed, as is the 29-**IV** & 35-**III**, but of the last 2, Chinn says "No precise details of these were available at press time." The old 6 bolt 60 appears, as does the 35-**II**, 29III**B**, and the 45 with a bald head. The factory at this stage probably only making a handful of the sand-cast 60's a week.
29-IV Model 5224	"*Latest Engine News"* M/A March 1964	Chinn announces the arrival of "the new Series 4 model Enya **29**." These 2 new engines (**29** & **35**) very versatile now, with the available option of 2 cyl. heads (7.5 : 1 & 9.0 : 1 CR) & 3 sizes of venturi inserts (engraved 1,2 & 3 same as 29-III & IIIB).This gave sixteen different theoretical combinations of compression ratio and venturi size.	First appearance of the most prolific Enya of all time – the ubiquitous Model **5224**. Both engines now have 6-bolt cyl. heads, and 1mm smaller lug holes than the Model 600I's, the latter possibly due to Warrings short sightedness! Early ones with continuous fins, later non-continuous. The **5224** Series became the Enya that was "all things to all men" and was probably the factory's biggest income earner for many years.

15-II, 15D-II, 19-IV, 29-IIIB, 29-IV Model 5224, 35-III, 45	Peter Chinn's "*Silencer Review*", M/A, April 1964	Peter Chinn announced that in September of 1963 the Enya company had introduced two generic sizes of muffler to suit their range from .15 to .45 cu. in. The noise problem was big news for ***all*** engine manufacturers at that time, mufflers becoming compulsory in the UK on 1st Jan. 1965. For a short time, this created a problem for those Enya engines fitted with the 2 needle carb, as the top (longer) needle fouled the muffler. The problem was solved by routing an extension on the needle valve, through a bushed hole in the muffler nose!	Note that the 29-**IIIB** and 29-**IV** were ***both*** mentioned in this context. Once again, as we have seen previously, it appears that there was a period of overlap and that the 29-IV was introduced in mid to late 1963 and was accompanied by the 29-IIIB for a period of joint availability. This situation would be repeated with the 35-II and 35-III. We have an example (the only one ever sighted) of the modified muffler to fit the twin needle carb equipped engines. Came on a 35-II bought from Germany, so may have been a local Robbe solution. The 15D-II appears to be the only Enya to miss out on a muffler.
09-II, 15-II, 19-IV, 29-IV, 35-III, 45	MRC brochure for the 1964 Enya range, and clearly aimed at the US market MRC = **Model Rectifier Corporation**	The 06 models and the 15 Diesel are missing from this sheet, as is the 60. In the MRC Dealer flyer however (dated early 1965) it states that "Special Application Engines - Ball Bearing, Diesel, and Marine are also available". First reference to the **35-III** & both it and the **29** now come pre-drilled for pressure tap (provided) with brass plug, beneath the main bearing.The 2nd generation throttles (TV) now feature both an idle adjustment and air bleed screw, with thin metal strip for actuating arms.	First appearance of MRC as the Enya distributors in the USA. Also, first appearance of the 35-**III**, which thus appears to date from early 1964 or maybe even late 1963. But the 35-**II** was to appear again, as seen in the next two entries! Seems that there was some overlap there, as with several other models. The 29-**IV** has now replaced the 29-**IIIB**, but the 09 and 15 models remain unchanged. MRC, whilst not advertising the fact too much ***did*** actually sell the old sand cast 60, whilst waiting for the all new 60-II to arrive. Price in late '64 of the std. 60 was $38.95 or with TV $42.50.
049,06, 06 D, 09-II, 15-II TV, 15D-II, 19-IV TV, 29-IV 35-III, 35-II TV 45 TV, 60 TV	Enya factory sheet came with 35-II TV German import by Robbe	Depicts the "bald head" **45** and old 60, along with the newer 29-IV and 35-III. No mention at all of the Racing Special.	Must date from early to mid 1964, as the Series II 06 is not listed. The 29-IIIB has finally gone, but both 35's, **II** & **III** are listed together.

29-IV Model 5224	*"Engine Review"* M.A.N. July 1964	Chinn states that this engine was "put into production *late last year"* (1963). If that's correct, this places the first appearance of the **29-IV** a tad earlier than we had previously thought. This all new 29 a statement of Saburo's maturity as an engine designer, as he wisely opted for better versatility and more robust construction rather than trying to extract the ultimate BHP, and in that regard, he succeeded brilliantly. The total number of Model **5224** engines (29 & 35) produced is unknown, but must have run into the hundreds of thousands. MRC quoted the same maximum power (0.80 BHP) for both the 29 & 35, with the max. revs of the 29 (18,000) 1K up on the 35 Factory sheets however, show a **2**K difference (35 maxing at 16,000 RPM)	Although giving the new **29-IV** a great report, Chinn was in later years, to betray some disappointment that it did not improve significantly on the 29-III's performance. The factory claim of 0.8 BHP, although not confirmed by Chinn in this test, should not be discounted however, as Enya tended to be quite conservative with their BHP claims. Chinn managed only 0.63 BHP on 30% nitro. He theorized however, that in full racing trim ie. no insert, H/C head, pressure fed with higher amounts of nitro, the power could be pushed up to 0.70 BHP, perhaps nearly 0.80 BHP "under ideal conditions". In other word's, the power output of the ball raced 29 Racing Special was well within the reach of the cheaper plain bearing 29 Early 5224's (prior to 1966) distinguished by the fitting of shiny, nickel-plated screws & the "continuous" fins, ie the gap between any two fins un blocked for a full 360 deg.
049, 06, 06D, 09-II, 15-II, 15D-II, 19-IV, 29-IV, 29 Special, 35, 60	August 1964 advert placed in Australian magazine "*Model News*" by Scientific Hobby Distributors Pty. Ltd.	This ad does not specify what model 35, probably just whatever they had in stock at the time. Also note that the 45 was not mentioned here although it was undoubtedly in production. The 29 Special is still on offer, at least in Australia, but close study of Enya factory instruction sheets indicate that the 29 Special must have been dropped pretty abruptly around the end of 1963.	Suggests once again that the 35 was in a transitional stage at this time. The 29 Specials on offer may have been old stock. We are left to wonder why Saburo did not persevere with a "hot" 29 As the new **29-IV** (even with plain bearing and milder crank timing than the 29-IIIB) was capable of matching the output of the Racing Special, it would seem a logical step to have fitted the later 29 with a single ball raced front end, similar to the Speedy.

049, 06, 06D, 09-II, 15-II, 19-IV, 29-IV, 35-II, 35-III 45, 60	c. October 1964 *"Global Engine Review"* published in American Modeler Annual for 1965	3rd edition of G.E.R. and Enya still well to the fore. The 29-IIIB has gone but the 35-**II** is still listed with the new 35-**III**. The 29 Racing Special has also disappeared into history, becoming in the process a great rarity nowadays.	Several photo's & drawings of the new 5224 engines are shown, Chinn stating that the pair are "based on a common main casting, shaft and front housing assembly, …the 35-**III** is thus slightly lighter than the 35-**II**" (by about 0.60 oz).
049, 06, 06-II, 06D, 06D-II, 08, 09-II, 15-II, 15D-II, 19-IV, 29-IV, 35-II, 35-III, 45, 60	Enya specification sheet, *c.* 1964/65	Here we see that the **06** has appeared in its Series **II** (front induction) form in both glow and diesel versions, although the former models are still listed. The **08** has also appeared. As per the listing in *American Modeler*, ***both*** the **II** and **III** Series 35 are listed. The old 60 is still listed, confirming this sheet to the latter half of 1964.	First appearance of the **06-II** models as well as the **08**. Seems to date their introduction to late 1964 or early 1965. Both versions of the 35 (**II** & **III**) continue to be listed together, the factory maybe having some excess stocks of the older model to shift. Recall that Enya seem to have taken the same approach in 1955-1956 with the 63 and 60 models. No other changes.

Just an observation here – in stark contrast to the earlier comments re. the Factory's slowness to update images & information on the instruction sheets, at this period of time (mid '64 to mid '65) the

opposite holds true. Study of the sheets from that era (taking into account what Models were listed and what weren't) reveal that they must have been updating them fairly regularly, every few months in fact. Note however, that due to the limited space available on the instruction sheets for photo's, they sometimes just retained the same technical information, but shuffled the photo's around to depict different engine Models. Demand for the product hitting new levels now, especially in the States. I.M.I. basically handed over a goldmine to M.R.C., as it was during this period that 95,000

of the 09-II's alone were produced. If you consider that there were 7 basic engine sizes manufactured by Enya in the decade from 1960 to 1970, and that the 09 was probably the least popular size sold in the States, it gives you some idea of the numbers of engines that must have been produced back in Tokyo, and sold world-wide. One of the most remarkable engineering facets of nearly all Enya's, was the fact that they were machined to such fine tolerances that it made the use of head gaskets totally un-necessary. This fact is almost unbelievable to anyone who has struggled to cure a leaky head even **with** a gasket !

049, 06D, 06D-IITV, 06, 06-II TV, 08TV, 09-II, 15D-II, 15-II, 19-IV TV, 29-IV, 35-III, 35-III BB, 45-TV, 60 TV	Enya brochure supplied with new 35-III purchased by Pat King Spring '66	No mention of the 29-IV BB Special as yet (***or*** the I0, although the **35-III BB Special *is*** listed. The 60 shown is still the old 6-bolt and the 35-II is still listed as well, so this probably dates from either very late 1964 or early 1965. The October 1965 issue of Model Airplane News featured an MRC advert depicting the new 35-III BB **Special** engine with the very early short lived and now rarely seen, convex radius propeller driver.	It would seem that the 35-II and the old 60 both finally disappeared in mid to late 1965, the 60 quickly, the 35-II maybe taking a little longer. This due, no doubt, to larger stocks of unsold 35-II's being held. It was also around this time (1965) that the factory started replacing the shiny, nickel plated Phillips screws with the blackened ones. Both the above engines however missed the cut, and were only ever seen assembled with shiny screws.
45 TV Model 600I plain bronze bearing	*"Engine Review"* M.A.N. March 1965	This engine too, appears to have the thinner head as mentioned above (Enya machinists license maybe?) Chinn remarked upon the "extremely high torque, which reached 75 oz. in. at between six and seven thousand RPM". In this same issue of MAN, an MRC advert appears depicting a finned head 45, so as far as MRC were concerned, the Bald head 45 had gone.	Probably due to editorial deadlines (ie. around late 1964 for this issue) Chinn tests the earlier **45** with the plain fin-less cylinder head. Excellent power to weight ratio would be even better, but twin needle carburetor accounts for nearly 1/5 of engines total weight, or almost 2oz. The finned head variant must have appeared in late 1964 or early '65, and was a tad (6 grams) lighter.

049, 06, 06D, 06-II, 06D-II, 08, 09-II, I0, 15-II, 15D-II, 19-IV, 29-IV, 29-IV Special, 35-III, 35-III Special, 45, 60-II	c. October 1965 *"Global Engine Review"* published in American Modeler Annual for 1966	Fourth time around for Chinn's Global Engine Review, and the old sand cast 60 has finally been dropped from the listings. The **29-IV BB Special** is now listed for the first time (although it may not have been actually released until *after* Chinn wrote this article), as is the new **08** and the **I0**. The R/C throttles fitted to most of these engines as options had a useful built in feature ie. the choice of either increased power ***or*** fuel draw as required. By merely slackening off the 6mm lock-nut & screwing the jet in or out, the balance of the two above preferences could be altered either way. As set by the factory, the normal position for the end of the jet, is just short of halfway across the air passage.	First appearance here of the brand new (and much more modern) **60-II** Model 7032. Also new are the "**Special**' versions of the **29** and **35**. The 35 was the first to be released, closely followed by the 29, probably in mid to late 1965.These have the same timing as before, but feature a new dual ball race, heavier front end casting and with an easily removable "D" prop driver. The **60-II** uses innovative technology, becoming one of the first engines in this class to feature bronze gudgeon pin bushes in the piston (alloy, for the first time in an Enya) as well as a rotating restrictor within the exhaust stack coupled to the carb. The unique chrome-plated castings on the 60-II must have been ditched after an initial run.
09-III, 09-III TV	*Latest Engine News"* Aero-Modeller April 1966	Announced that the two **09-III**'s are the "latest products" from Enya, so this means early 1966. At this point in time, quality in the finished product at the absolute zenith. The engine depicted still with the shiny screws, but most of the production would be assembled with black screws. Most Enya's now available in Marine versions, and apart from the water cooling jacket over the machined down fins (sealed with epoxy) most are also fitted with a steel prop/flywheel driver. As with the 29-III, this 09 developed great torque for its size and capacity.	This **09** is entirely new with larger diameter shaft and different bore & stroke to old 09-II (now oversquare at 0.512 in. x 0.480 in. in lieu of square 0.5 in. x 0.5 in. previously). No mention of the 15-III, so the 09-III must have been about 6 months in advance of its larger sibling. The **09-III** was probably the first Enya to have the non-continuous cylinder fins right from the start, closely followed by the 15-III and the 45BB. Study of subsequent MRC adverts & factory literature show this feature was progressively added to each new model as they appeared. By 1973, the change completed.

60-II TV Model 7032	Published *Engine Review* MAN, May 1966	Once again, a very favorable report by Chinn on a new Enya! This **60** a totally fresh design and completely different to old sand-cast 6 bolt, now sporting a (twin) ringed alloy piston in place of lapped cast iron. The **60-II** was the only Enya ever to feature shiny, chrome ***plated*** castings (not polished as on 09-II & 15-II). MRC bragged about this satin finish in their adverts. for the new 60-II, and it sure did look good when new, although it tended to peel with use. Photo's of chrome plated 60-II in C/L & R/C guise found in Chinn's 1966 Global Engine Review. Later castings the more usual Enya alloy finish. Very early models had a small hole in the exhaust restrictor, later ones had a larger 3.2mm one, and this helped considerably to improve the idle.	This engine was only in production for about 6 months before receiving an upgrade (in early 1966) to reduce the risk of damage from lean & hot runs. This involved a thicker piston crown, as well as skirt ports to help expel hot gasses from beneath the piston. The **60-II**, whilst primarily an R/C engine, was also available as a dedicated C/L stunt model with "solid" exhaust stack, and 7mm & 9mm inserts. In his attempt to extract the maximum power from this engine, Saburo Enya went a little overboard. The shaft rotary induction port did not close until 55 degrees ATDC. This is racing engine timing, with the result that the 60-II, while powerful, tended to backfire occasionally, kick its prop off or run backwards. It thus was happiest on a relatively small (11X6) prop and at high (13,000) RPM.
09-III std.	Aero-Modeller *Engine Test*, June 1966	Phenomenal output and torque from such a simple, basic little engine. In 1966, there was ***NO*** other 09 better than it, up to 14,000 RPM. Over that, only the Cox TD 09 edged ahead slightly in outright power, the Enya retaining superior torque. The **III** more compact in size than the 09-**II**, due to shorter stroke, as well as an even thicker (2.5mm) cylinder liner.	Produced more power for its size than the original 29-III. Early 09-**III**'s had a rigid NVA (not interchangeable with the 09-**II**) but later changed to the familiar Enya flex, sadly not scaled down to suit the smaller 09. By this time in 1966, both of the 5224 Specials had been released, and now with the more familiar stepped prop driver (visually identical to the driver on the 45 BB, & the later 40 and 45-II).
09-III & 09-III TV	Published *"Engine Review"* MAN Nov. 1966	Chinn states that the first 09 "was superseded in 1960 by the 09-II.." and "another six years later (1966) the 09-**II** has itself been replaced by the 09-**III**."	Only a bit over halfway through the decade, yet this is the ***thirteenth*** (not counting the littlies) new Enya to be released onto Western markets since the end of 1959 - only 4 to go!

049, 06, 06-II, 06D, 06D-II, 08, I0, 09-III, 15-II, 15D-II, 19-IV, 29-IV, 29-IV Special, 35-III, 35-III Special, 45, 60-II	Enya factory brochure came with NIB finned head 45	This sheet lists the 60-II ***and*** the 09-**III**, yet the 15 is still the **II** (not the **III**) so the printing date can be accurately pinpointed as being early in 1966. The 45 is still the iron piston & plain bearing 600**I**.	This demonstrates how well a time frame can be worked out simply by what Models are, and aren't listed. At this point in time, the Speedy is long gone, both Specials are listed, but the 15-III has not arrived as yet.
45 BB TV Model 600I Mistakenly called the 45-II	"Radio Modeller" Dec. 1966	Chinn announces that the "Enya 45-II (sic) TV, just released in Japan". When first introduced, the piston in these **45 BB**'s had 2 rings, later just a single. Exceptional engineering quality throughout. This 45 probably exceeded the expectations of both the buyer and designer alike by a large enough margin to justify the earlier than anticipated dumping of the plain bearing model.	This dates the very first appearance of the **45 BB** to late 1966, which is earlier than we previously thought. The new 45 features a prop driver very similar looking to the smaller 29 & 35 BB Specials. Chinn mentions that the old iron piston 45 was the most powerful 45 produced during the six year period 1959 – 1965. The 45 BB, although a bit heavier than the old model, still a great C/L stunt engine
15-III Model 3303	Published test in Aero-Modeller, July 1967	New **15** has ditched the polished castings, only available now in the usual matt grey. Chinn later reported that this engine had first appeared in Sept. 1966. Peak power 0.22 BHP at 12,400 RPM in stunt trim, or 0.29 BHP "racer" (30% nitro).	Seems to conclusively date this model to September 1966, which is probably the exact same time the 45 BB first appeared. New 15 now with turned alloy venturi insert in (2) optional sizes, and all new parts, bigger shaft & improved porting.
15-III TV	*"Engine Review"* MAN Sept. 1967	Chinn reiterates that the Enya 15-IB was put into production in Jan. 1957, the very first 15 glow in "early 1955."	The **15-III** TV described as "finely built" and as having a "very impressive throttle performance," especially so for this size engine.

049, 06, 06D, 06-II, 06D-II, 08, 09-III, I0, 15-III, 15D-II, 19-IV, 29-IV, 29-IVBB Special, 35-III, 35-III BB Special, 45, 45 BB Model 600I, 60-II Model 7032	Late 1967 Global Engine Survey published in 1968 "American Aircraft Modeler Annual"	Fifth and final time for the (now named) Global Engine Survey. This was the article in which Chinn mentioned that **95,000** of the 09-II's were produced over a 6 year period, only the 2nd time that he ever quoted such figures. The new **45** (now with its correct designation **BB**) has officially arrived, and features a simpler (and much easier to adjust) single needle carburetor, coupled to a swiveling exhaust restrictor, not internal as on the 60-II.	This article provides a snapshot of the situation as of late 1967, and it specifically dates the **15-III** to September 1966, as noted above. The 60-II TV is reported as having won the US Nationals and the R/C World Championship in 1967. Both the original 06-I Models are still listed, as is the 15D-II, the iron piston 45, and the 19-**IV**. The 19-**V** must therefore have been released sometime during 1968, if the Nov. 1968 MRC leaflet mentioned below is correct.
049, 06, 06-II, 06D, 06D-II, 08, 09-III, I0, 15-III, 15D-II, 19-IV, 29-IV, 29-IV BB Special, 35-III, 35-III BB Special 45, 45BB, 60-II	Enya factory spec. sheet, came with 19-IV TV circa mid to late 1967 (price $15.50)	Here we see the 06 both original & II, the 19 is still the IV and the iron piston 45 is listed as well. By the time the list below was printed, the first 06's had been dropped, also the plain bearing 45, yet the 19 is still the IV on both sheets.	This is proof of how often the Factory was updating their instruction sheets at this time. Compare the listings on this sheet with the ones listed directly below – there must have been only a few months difference between the two (this one a tad earlier).

049, 06D-II TV, 06-II TV, 08 TV, 09-III, I0 TV, 15D-II, 15-III TV, 19-IV TV, 29-IV, 35-III, 45 BB, 60-II TV	Enya factory spec. sheet circa late 1967 or early 1968	Date of this sheet can be deduced fairly easily, as it still lists the 19-IV, yet shows the 45 **BB** and the 15-**III**. The plain bearing 45 has now gone into history, as has the rear induction, first model 06 Diesel & glow seemingly indicating an over-lapping availability period (with the 06-II) of something like 3 years! The 19-**V** must have arrived ***just*** after this was printed. The Enya Metal Company now world renown as a producer of top class model engines, second to none. The development of new models however, now slowing a bit from the frenetic times during the previous 10 years.	New kid on the block is the **I0** TV, which must have arrived slightly later than the 08 TV. The **I0** did, however, appear in the 1966 *"Global Engine Review"* so it must have first arrived in 1965.It would appear that despite Chinn's comments below that the 45 **BB** was not meant to replace the plain bearing 45, the latter was quietly dropped from the factory line-up probably in 1968, only 12 months or so after the 45 **BB** was released. This no doubt, due to small demand for what was seen as an outdated engine. That it was, but its excellent credentials as a C/L stunt engine ensured that it would be resurrected in 1972 as the 45 **S**.
45 BB-TV Model 600I	Published *Engine Review*, MAN Feb. 1968	New ball raced **45** touted as smoother and more refined, which it surely was. Aimed at those wanting a slightly smaller engine than a 60, but still with some of the "De-Luxe" features found in the larger sizes, ie. twin ball races and a ringed alloy piston with bronze gudgeon pin bushes. Chinn says "We would venture to rate this motor very near the top of the .45 cu. in. R/C engine class."	Although bearing a family resemblance to the plain bearing 45, this new model is basically a completely new design, intended to ***supplement*** the earlier 45, not supersede it. Vibration now substantially reduced compared with the old iron piston 45's, thanks to alloy piston with two ¼ in diam. skirt ports. No huge power increase claimed over the old 45 (maybe 10%), but easier starting, less run-in time required and much better handling than before.

19-IV TV Model 4004	Published *Engine Review*, MAN July 1968 ***Also*** Aero-Modeller *Engine Test* January 1969	Last of the "long stroke" **19**'s (or more precisely, square at 16.0 mm x 16.0 mm). Chinn giving praise to Saburo says, "History of good engine design reason for its qualities." Also noting however, that starting was "not so foolproof " as expected, when hot. No interchange of parts with any previous Enya 19. This little engine turned an 11 x 4 wooden prop @ 7,800 RPM and a 10 x 6 Tornado nylon @ 8,000 RPM with throttle!	In this 1969 Aero-Modeller test, Chinn says "this year (Enya) will complete 20 years in the model engine manufacturing business." By the time this test was printed the **19-V** must have been in the shops, in the States and Japan anyway. The reason Chinn gives for the extreme lateness of this report was that Keil-Kraft (the UK importers) had been unable to obtain adequate deliveries over the previous 3 years.
09-III, 15-III, 19-V Model 4005, 29-IV (PB & BB Special), 35-III (PB & BB Special), 45 BB, 60-II	MRC-Enya parts sheet dated November, 1968	Both BB Specials, 09-III & 15-III are all now listed (all having been around for a couple of years) as well as the new **19-V**. The 45 is now the **BB** model, and the 60-II is well established, although its successor is only a year away. The 15D does not appear here, nor do the smallest models. Due to problems (read operator) with the 60-II, the fuel mix now being recommended specifically for the **45 BB** & **60-II** (the only two with alloy pistons) is worth noting. Compared to the iron piston engines, the fuel for these two should contain 5% *more* castor but 5% *less* nitro. It would seem highly unlikely that production of the complex twin-needle carburetor ever continued after the 45 BB appeared.	Taken with the previous source, seems to suggest that late 1967 or early 1968 saw the phasing out of the 15D-II, probably also the plain bearing 45's in favor of the more refined 45 BB. Although not appearing in the Enya literature of the time, the 15D and the old iron piston 45 were both probably still available until 1970 or so, certainly in the ***shops*** – Bob has a plain bearing 45 Model **600I** TV which was won as a "lucky door prize" on the final day at the Camp Humphreys aux. post hobby shop, Pyongtaek Korea in late 1970. However as the included instruction sheet clearly dates from late 1964, this just shows how long it sometimes takes to sell an engine! The C/L 45 with plain bearing was probably still being made after the TV version faded.

60-III Model 7033	*Test report* in MAN, March, 1970	Peter Chinn tested the then new **60-III** Model 703**3**. As is usual now with all new Enya's, the latest one is basically a whole new design, with almost no parts that are interchangeable with the previous model. 60 now with more sophisticated "G" type carburetor with auto. mix control giving much improved throttle response and idling. Saburo's aim with the 60-**III** to regain lost ground in the power stakes, Multi R/C the world's # 1 "Blue Ribbon" event.	Specifically dates the introduction of the 60-**III** on the Japanese market to October 20, 1969. Supplies only began arriving in the USA and elsewhere in March 1970. This new 60 up on power by 25-30% over the old 60-II, due mainly to better breathing ie. bigger bypass & exhaust ports, twin 7.7mm diam. skirt ports etc. Crank timing only slightly milder than before so still a tendency to kick back sometimes, but an overall big improvement on the 60-**II** Model 703**2**.
09-III, 15-III, 19-V, 29-IV (PB & BB Special), 35-III (PB & BB Special), 45 BB, 60-III	MRC-Enya parts sheet dated January 1st, 1971	For any non-Enyaphiles who may be reading this do not confuse the early 29 Special with the later 29 Special. The earlier one ("Racing Special" or "Speedy") was based on the 29-IIIB and had a single rear ball race, and with the "bathtub" intake. The second 29 Special was much milder and based on the 29-IV, but with a silky twin ball race front end. Pressure fuel feed not required. Sadly, neither of the BB Specials were ever bench tested by Chinn. The ball raced shaft was only worth an extra 0.05 BHP over the plain bearing models, but much smoother running!	Naturally, the latest 60 has now been added, but no other changes from the 1968 sheet. It was probably around this time (1970/71) that the **049-II** first appeared on the Japanese home market. The first 049 though was still being depicted on factory sheets into the early '70's, as was the 15 Diesel Mk. II. MRC (assisting us historians greatly) used to date their parts sheet in one corner. The very first commercially made Schnuerle ported engine (HP) had been on the market for over a year at this point in time, so ***all*** engine manufacturers were busy developing their own version of this technology.
049, 06D-II TV, 06-II TV, 08 TV, I0 TV, 09-III, 15-III TV, 15D-II, 19-V TV, 29-IV, 35-III, 45BB TV, 60-III TV	MRC-Enya factory instruction sheet came with 09-III (priced at $11.98)	Interesting, in that the 15 Diesel is ***still*** depicted & listed on the factory spec. sheet, but not on the separate MRC parts sheet. Due to declining interest in Diesel's at this point in time, the factory may have had excess stocks of 15D's to move.	As this sheet depicts the 60-III, yet still shows the square venturi 29 & 35, this would appear to date from 1970/71.This suggests that (unless they were just slow to remove the image) the 15D-**II** may have still been available a few years later than we previously thought.

45 BB **Model 600I**	R.C.M.& E. May 1971	Chinn does a "mini-test" on the, by now, 4 year old **45BB**, for English magazine R.C.M.& E. He says "it is certainly one of the best 45's ever built." Interesting also to note that the engine was (at that point in time) one of the very few R/C 45's still in production. The new crop of high power 40's now eclipsing the older slow revving 45's.	Tardiness here due to the 45 not appearing in the UK until mid 1970, this being when the new British Enya distributor Rip-Max took over. The test engine still had the 2 piston rings, but whether it was a new production one, or one out of Chinn's collection, we do not know. We suspect that the 45BB crankcase die was altered slightly, around this time also.
19-V Model 4005 plain bearing	Aero-Modeller *Engine Test* June 1972 ***Also*** *"Engine Review"* Model Airplane News, Feb. 1972	Chinn states "as its title suggests, the **19-V** is the fifth model in the Enya 19 series, which began life more than twenty years ago." Summing up, Chinn rated the 19-**V** "the best of the Enya 19's produced to date," also stating it was "just about the most powerful plain-bearing 19 R/C engine tested to date." The stroke (by 1mm), rod (by 2mm) and piston have all been shortened, meaning this new **19** has a lower overall height than the previous 19-IV, also fits a narrower bearer spacing. The tester also noted (as he did with the 19-IV) that starting qualities "were not as good" as most other Enya's he had tried.	The new 19 heralding in the switch to "oversquare" bore and stroke dimensions (square in all previous Enya 19's). It was around this time also that the re-make of the 45 plain bearing, iron piston engine appeared. The factory did this in response to requests from top Japanese stunt flyers (guys like Shoji Sasaki) and the result was an engine which had even more low down "grunt" than the old 45! An attractive feature of all Enya engines was the light flash chrome plate finish on the machined edges of the cylinder fins and head, which however, being razor sharp, can draw blood! The plating is also the reason why scratches cannot be polished out.

09-III, 15-III, 19-V (PB & BB), 29-IVB, 29-IV BB Special, 35-IIIB, 35-III BB Special 45 BB, 60-III, 60-IIIB	MRC-Enya parts sheet dated January 5th, 1973	The ball bearing model of the **19-V** has now been added, and with the 60 in transitional stage, both the earlier 60-**III** and brand new III**B** versions are listed. The new one is still a Model 703**3** and appears almost identical to the older one, apart from the removal of the exhaust restrictor, which means no large holes fore & aft, need now be in the exhaust stack. At this point in time, the main emphasis now on R/C engines, not C/L.	Seems to place the arrival of the 1**9-V BB** in 1971 / 72, the 60-IIIB arriving in Aug. 1972. Also in 1972, the plain bearing 29-IV and the 35-III which had previously been fitted with the square, black plastic venturi inserts, now came with round, turned alloy ones, which altered their designation to 29-IV**B** and 35-III**B**. The Specials with ball raced shaft retained the square venturi, along with the old (non B) suffix. This would remain the case until the arrival of the Series **V** Model 522**5** BB engines.
45 S	1973 Japanese modeling magazine Engine test by - Akira Fujimuro	This is the dedicated C/L stunt, plain bearing **45** based on the earlier 45 Model 600**I** with finned head. This engine would itself be the basis of the 45 SM another 34 years into the future! Unique for this period in time, it was specifically for C/L stunt only – not available with R/C throttle. Production figures are unknown, but probably a few hundred at the most.	This engine employed the main case casting from the 45 BB, so can be identified by the boss in the center of the exhaust stack, o'wise being almost identical to the earlier plain bearing 45. Internally though, changes were greater, eg. the crankshaft was unique to this engine and the stroke increase of 0.2 mm gave it a larger capacity of 7.43 cc. Unusually, this was midway between the earlier model, and the 45 BB.

60-IIIB and 60-IIIB G8 Model 7033	*Test report* in MAN, April 1973	Peter Chinn tested this upgraded version of the 60-**III**, now available with optional "G8" 8mm carb. for extra power with fuel pressure. Although this newer **60** uses the same basic castings as the earlier III Model, it utilizes a new shaft, head & piston (machined from casting, not bar stock as before, & now with 1 ring only). **60-IIIB** with G8 now capable of over 1.30 BHP at 14,500 to 15,000 RPM. This is "Outstandingly good" says Chinn. Almost 40 years down the track, the **60-IIIB** is still a World Class engine.	Dates the introduction of this model in Japan to August 1972. Deliveries to the USA began in early 1973. New **B** variant of the 60-**III** comes with revised porting, higher compression ratio. G8 model produces same power ***with*** muffler, as standard carb. version ***less*** muffler, or about 12 % more if both with muffler. About this time (early 1973) MRC started changing to the red & black cardboard boxes (larger than the previous plastic ones), but 60's still packed in their own, larger factory boxes with the yellow foam inserts.
19-V BB Model 4005 Standard venturi C/L model	*"Engine Review"* MAN July 1974 ***also*** Aero-Modeller *Engine Test* Nov. 1974	Basically a shrunken version of the 29 & 35 BB Specials. All new front end, with ***larger*** 12mm diam. crankshaft running in special 12-ball rear race of only 21mm O.D The **19-V BB** came with 2 sizes of venturi inserts but unlike the larger twin ball raced engines, the 19 came only with the single cylinder head, but the standard compression ratio went from 7.5 : 1 in the plain bearing model to 8.5 : 1 in the BB, with slightly different port timing as well. Shaft now with non-metric ¼ UNF threads, the same as on the 29 & 35 BB Specials.	Chinn states (in both these tests) that the "manufacture of the Model 4004 continued for seven years." In the same breath though, he says in the AM test that the 19-V was "first seen in 1970" (obviously referring to himself personally). This is completely at odds with the MRC parts list mentioned above, dated November 1968. Using Chinn's dates given above, this places the introduction of the 19-V as being in 1969 or even 1970, by which time of course, it had actually been in the shops for more than a year. Pat's 1968 MRC parts sheet clearly shows that the 19-V ***was*** listed at that time, so Chinn goofed slightly here.

09-III, 15-III, 19-V 35-IIIB TV, 35-III BB Special TV, 45BB, 60 (does not specify which Model, but would be the IIIB)	Double page *RipMax* advert in Aero-Modeller headed *ENYA '74*	The plain bearing 35 is shown correctly as the III**B** model, and by this time of course, ***all*** of the engines depicted have non-continuous cylinder fins (ie. a small vertical web, placed fore and aft, between the cooling fins). Possibly the last engines to receive this being the 29 & 35 "B" variants in 1972. This advert printed prior to 45-II's release.	It would seem that all plain bearing Model **5224** engines manufactured after 1972 (ie. the 29-IV**B** & the 35-III**B**) had the non-continuous fins. Its possible though that some BB Specials (being lower volume sellers) with the continuous fins might have appeared after 1972, being assembled from older castings still in the parts bin.
09-III, 15-III, 19-V (PB & BB), 29-IVB, 29-IV BB Special, 35-IIIB, 35-III BB Special 40 Model 6002, 45BB, 45-II Model 6002, 60-III, 60-IIIB	MRC-Enya parts sheet dated January 4th, 1975	The new arrival this time is the **40** Model 6002. The **45-II** is also in evidence, although the old 45 BB remains on the list as well. Both the 60-III & IIIB remain listed - the **III** would eventually fade away, but the III**B** would go on to become Enya's single longest production engine.	Appears to mark late 1974 as the introductory date for the **45-II** Model 6002. The 40 must have arrived in late 1973 or early 1974, thus preceding the new model 45-II. Both the new 6002 engines with "bumps" at rear of case (matching those at the front) and both available in std. C/L models as well as R/C.
40-TV Model 6002	*Engine Review* MAN Feb. 1975	The new **40** sports a 60 size shaft of 15mm, the "biggest yet seen on a 40", (not the first time that Saburo has claimed that title) to try and match the Schnuerle ported engines from other manufacturers. The max. BHP recorded in Chinn's test of 0.87 @ 16,000 RPM is very close to the 0.9 BHP Factory claim.	It took almost a quarter of a century to happen, but Enya finally got around to making a **40**, being about the last major manufacturer to do so. First Enya ever to feature a Dykes ring (as did the 40X) and is significant in that it marked the apogee of cross-flow scavenged 2 stroke pre Schnuerle development for the Enya Company.
19-V BB TV Model 4005	*"Engine Review"* by P.G.F. Chinn MAN October 1976	This engine is the R/C version and proved to be ***very*** smooth in the 11,000 to 12,000 rpm bracket. Minimal (maybe 10%) power increase over bronze bushed 19-V, but a more refined engine with minimal weight penalty. The last **19** to feature the TV coupled swiveling exhaust baffle.	This is the ***third*** time that Chinn has tested a 19-V BB (first two C/L models). His verdict? "There are one or two rival 19's that can exceed its peak power output, but on the basis of our test findings, few can better it for all-round merit." What the ball raced shaft did for the 19 pretty much sums up what it did for the 29 & 35.

We do not know the reason why, but Enya didn't use the same bore/stroke on the various 45's that it produced over the years. The measurements for the 2007 45 S M obtained from factory sheet.

	Bore / Stroke	Capacity	Factory BHP	Weight (std)
45 Model 6001 finned head	22.2 x 19.0 mm	7.354 cc	0.90	241 g.
45 Model 6001 bald head	22.2 x 19.0 mm	7.354 cc (0.4488 cu. in.)	0.90	247 g.
45 **BB** Model 6001	22.3 x 19.2 mm	7.499cc (0.4576 cu. in.)	0.90	265 g.
45 **S** (1972 remake)	22.2 x 19.2 mm	7.43 cc	0.70	246 g.
45**-II** Model 6002	22.3 x 19.0 mm	7.42 cc	1.15	285 g.
45 **S M** (2007 remake)	22.2 x 19.00 mm	7.354 cc	0.70	241 g.

All the "littlies" **+ 09-III, 15-III TV, 19-V TV, 29-IV B, 35-IIIB** - both the latter in std. & TV, **40 TV, 45-II TV, 60-IIIB TV, 60 XF**	MRC Enya factory brochure. Came in (red & black) box with my 29-IV BB Special	Both sizes of the Model 522**4** BB Specials were manufactured for a period of about 15 years, until the arrival of the 522**5**. Both came with dual cylinder heads, the lower ratio one (fitted) was 7.5 : 1, the same as supplied with the plain bronze bearing engines. The higher compression one however, was half a point higher at 9.5 : 1.	This sheet must have been printed just prior to the one below and confirms that the 45-**II** Model 600**2** had replaced the 45 BB Model 600**I** by early 1975, and also implies that the 15-**IV** and 19-**VI** must have appeared around 1976. As the 60 XF is listed, the information here must date from probably the first half of 1975 (the new 60 was first seen at the Tokyo Model Show in Oct. 1974). The 60 XF the first Enya to employ Schnuerle porting.

049-II, 06D-II TV, 06-II TV, 08 TV, 10 TV, 09-III, 15-IV TV Model 3304, 19-VI BB TV Model 4006, 19X TV, 29-IVB, 35-IIIB, 40 TV, 45-II TV, 40X TV, 60XF TV	This Enya brochure came with a NIB 35-III Special, and must date from around late 1977 or early 1978, as it depicts 3 of the new Schnuerle ported engines	The 15 is now the **15-IV** Model 3304, externally very similar to the III except for a cast band around the front of the housing, just behind the prop driver. Presumably to reduce wear, the con-rod is now 1mm longer between eyes, with a corresponding slight increase in cyl. height. Both the BB and plain bearing **19**'s are now in their sixth (and final) incarnation. The newest one here is the little 049-**II**, now with front, rotary shaft induction, also now available with a TV unit.	This leaflet confirms that the **15-IV** must have entered production before the 09-**IV**, the latter arriving about 1979 with the "smaller" exhaust. The **09-IV** was available with a single rear ball raced shaft (marked by a red prop drive) which gave an extra 2,000 RPM (in the TV version) and 0.02 BHP. The **19-VI** can be identified easily by a small, rectangular block between the top of the transfer bulge & the bottom cylinder fin. Presumably, this is to help locate the muffler strap in the best position, and/or prevent damage to the crankcase from ham-fisted tightening. The **19X** appears to have been replaced fairly early by the **2I**X, later **25**X.
35-IIIB TV	M.R.C. promotional advert. from MAN Sept. 1979	Depicts a stripped down 35 after 104 continuous hours & 20 min. running. This feat saw the **35-IIIB** consume 5½ gallons of glow fuel, whilst running at speeds varying from 3,000 to 10,000 rpm. We now know why Enya's are hard to wear out.	This is interesting in that it gives some sort of indication of wear patterns in a lapped iron piston engine, after 104 hours of non-stop running. At TDC, wear was 0.0005 in. in the cylinder, ***zero*** wear gudgeon pin, shaft bearing & crank pin, & only 0.0005 in. reduction in piston diameter.
23 Enya models listed	*RipMax* advert from Aero-Modeller December 1979	The "traditional" Enya's with lapped iron pistons are now entering their twilight years. However, the superb consistency (seen for more than three decades) in the lapped piston/cylinder fit, seemed to waver a little in the final **5225** Series.	This gives some idea of the extra cost incurred for the new AAC metallurgy and Schnuerle porting eg. the 19X was a tad over twice the price of a 19-V, but the 40 Model 6002 was only two thirds the price of a new 40X. The new generation of 4-Strokes and composite metal 2 strokes now displaying super precise machine fitted pistons.

049-II, 06-II, 06D-II, 08, 10, 09-IV, 09-IV BB, 15-IV, 19-VI, 19-VI BB, 19X, 2IX Racing, 2IX TV, 25X TV, 29-V, 29-V BB, 35-V, 35-V BB,40 40X, 45-II, 45X TV, 49X TV, 49X TV Heli, 60-IIIB, 60-IIIB TV G-8, 60XF-II TV, 60XF-III GM10	Enya factory sheet	The **5225 29** & **35** must have just been released, as they are depicted and listed correctly in the specification column, but elsewhere, the text still refers to the earlier 29-IVB & 35-IIIB. The 60XF in transition from **II** to **III** and both the **2IX** & **25X** have arrived. As before, the factory recommends at least an extra ½ hour initial running-in time for both the 29 and 35 only.	This sheet probably dates from late 1979 and is almost certainly the last one where the majority of engines (18 in this case) listed here are still 2-Stroke & **non**-Schnuerle ported. The new **29-V** and **35-V** shown in TV form with improved G5.5 mm. throttles & as both these new engines came only with a 7.5 : 1 cyl. head, the quoted maximum RPM is reduced by 1,000 in each case, compared to the previous 29 and 35.
049-II, 06-II TV 09-IV TV	*RipMax* advert. Aero-Modeller Nov. 1982	This shows the **09** in its fourth incarnation, but it appears identical to the 09-**III**, except for exhaust now on opposite (R.H.) side. The later 09-**IV** was tested by Dick Roberts in Aero Modeller May '96	The early 09-**IV**'s had a **III** size exhaust stack, later the massively oversized one. Quite surprisingly, both the smaller engines ***dearer*** than the 09 eg. the 049 by 2 quid & the 06 by almost 3 quid !
45-II Model 6002 40 Model 6002	Factory sheets	The **45-II** a development of the 45 **BB**, but as usual, it was basically an entirely new and beefier design. For the ½ oz. weight increase, you got a bigger shaft, increased C/R, revised porting and a slightly shorter stroke, meaning an extra 0.25 BHP and a 1K increase in peak revs. Both engines of course, had a twin ball-raced shaft & alloy piston, the 40 with a Dykes ring, 45-II with a conventional piston ring. No known variants exist in these two Model 6002 engines.	Not counting the re-make of the 45 SM, the 40 & 45-II were the last mid-size, loop scavenged Enya engines to be made before Schnuerle fever took hold. A close study of Enya literature shows that *both* the Model 6002 engines were still being listed in mid 1988 (as was, incidentally, the 45S), the 40 however, only in its TV form. By around 2000, the 40 seemed to have gone followed by the 45-II a few years later. A couple of years ago though, Enya seemed to have dusted off the old tooling, and quietly resurrected the 45-II (C/L only) with a Delrin venturi.

049-II, 06-II, 06D-II, 09-IV, 15-IV, 19-VI, 19-VI BB, 29-V Model 5225, 29-V BB, 35-V Model 5225, 35-V BB, 45S Model 600I, 45-II, 49X, 60-IIIB	Enya instruction sheet came with NIB Enya 06-II TV, clearly dating from the early 1980's as the 4-stroke, CX & SS models are also listed The Schnuerle **49X** (Model **6I0I**) was used with some success in C/L stunt by US flyer Bill Simons, as well as the Japanese champion Akihiko Yamada. Basically a "bored" 45X lifting capacity by 0.49cc, the 45X in turn was basically a bored & stroked 40X. The **49X** was tested by Mike Billinton in FM Nov. 1981 issue	The 06-II is still listed, but the 08 is not. The 09, 15, 19, 29 & 35 models have all moved on to newer versions, and the 49X has arrived. The 60-**IIIB** is still listed, but it was the intention from when the 60**X** was first released to continue to offer the old cross-flow 60 alongside the newer Schnuerle model, to give buyers a much cheaper alternative. The **60XF** (dubbed Model **7I0I**), although 18% heavier than the old IIIB, put out 20% more power with less vibration. The **SS** (1980's), **CX** & **X** models assembled with socket head screws. The **29-V** and **35-V** must have arrived circa late 1979 or 1980. However by the mid 90's (due no doubt to the ever decreasing demand) both the 29 & 35 seem to have quietly faded from the scene.	We're now moving out of the "classic" era, although it's interesting to note that a few of the old classics are still soldiering on in slightly more updated form, eg. the 29 & 35 are now in their fifth incarnation. **Note:** there never was a 35-**IV**, although a 35**X** did appear later. In this case however, the "X" denoted Schnuerle porting, not the Roman Numeral for 10. Similarly, only one (non-Schnuerle ported) Enya 40 ever appeared. The final Model **5225** 29 & 35's with matching "bumps" at the rear of case (similar to the 40 & 45-II) and now with alloy head gasket in lieu of spare H/C head. 7 cylinder fins on the 5224,reduced to 6 on the 5225,but the latter with a deeper head. The BB versions have a smaller front race than before, and with a round venturi insert. The **09**, **15** &**19** sizes would continue on, long after the 29 & 35 disappeared.

60III B TV G-7, 60III B TV G-8 60XF-II (ring)	*Altech Marketing* Advert. MAN Feb. 1983	Shows the two older 60's with the Series II 60 Schnuerle. G-7 & G-8 refers to carb. size. The 60-XF went through four incarnations, all with the hi-tech, expensive but light **AAC** technology. Some models available though with optional ringed piston with steel liner. The XF-**III** gained an extra 0.10 BHP and 1000 rpm over the XF-**II** thanks to GM10 carby. The new Al-Chrome 60's actually ran cooler than the old 60's ringed alloy piston in a steel liner. Interestingly & at a later date, some engines (eg. the **CX 11 Model 220I**) which started out with **AA**C would revert to the **AB**C piston/liner. Almost certainly done to lower costs but definitely adding weight! The **SS** (Super Sport) models were Schnuerle ported also & utilized a nitrogen gas hardened steel cylinder. All Enya's with **AAC** are incredible examples of precision metal engineering.	Confirms that the **60-IIIB** was indeed still being produced and sold a decade after the newer Schnuerle arrived. As it is *still* available today with production seemingly continuous since 1972, the **60-IIIB** must be regarded as having the longest production run of any Enya – 38 years in fact! The 60**XF-4** (appearing in 1988) became the first Enya to offer an optional, built-in, geared fuel pump. The 60XF was later to appear as the **80**XF (still Model 7I0I) with a ringed piston, and 2 HP @ 16,000 rpm. Even the budget SS models with iron pistons displaying state-of-the-art piston / liner fits to incredibly close tolerances (Altech claimed honing to within 1 to 3 Microns). Ken Enya confirmed to me in 2009 that they had an "old, maybe 25 years" CNC machine probably coinciding with their entry into the 4-stroke market. Tooling up for the 4 Stroke and Schnuerle engines must have been a massive financial investment for the Enya Company – did they ever fully recover?
45 S M Model 600I plain bearing, lapped iron piston	Factory remake	This "remake of a replica" was released in limited quantities in late 2007, but has a slightly shorter stroke than the '72 45S (in other words, it reverts back to the stroke of the original old 1960's Model 600**I** 45 plain bearing). Uses separate machined alloy venturi insert (1 size only supplied) and for C/L use only. Shaft thread is overly long.	Not identical to the 1972 engine - this one utilizes the less robust front bearing housing from the previous **5225** Series 35, and shaft ***will*** bind in bearing if spraybar nut is (even mildly) over-tightened (not enough metal left after intake aperture hole machined out for the larger 45 size venturi insert). No boss in the center of the exhaust stack as before, and compression (as delivered) seems too great for stunt.

09 "Quicky"	Enya factory, new release, late 2008 for the TV version, Feb. '09 for the std. C/L model.	At this point in time (Feb. 2009) the very latest from Enya with the old style metallurgy and porting! Sadly though, a cross-flow 15 glow with a ball raced shaft was never produced. The 60-IIIB & 45-II are still made in std. Control Line form, but with nylon (or Delrin) venturi inserts in lieu of turned alloy previously, the 60 now with a drilled through exhaust stack for bolt-on muffler, in lieu of the strap-on type. The remainder of Enya stunt engines now Schnuerle ported or 4-stroke.	A modern day midget dinosaur, the **09** with a twin ball-race shaft – the C/L model particularly attractive with its tall, alloy venturi insert. The only "original" Enya's left now (albeit over weight and suffering the added indignity of being fitted with cheap, stamped steel prop washers in lieu of the pukka turned alloy ones) are the 15-V, & 09-IV. The **15-V**, whilst only developing the same power as previous 15's, now saddled with new & heavy crankcase designed to be bored out for larger (20) sizes. The 19's have all gone, the **5225** Series **29** and **35** *long* gone.

Footnotes

"Few Companies can have had so much experience in producing glow-plug engines in the .20 cu.
in. or 3.5cc classes as the Enya Metal Products Company Ltd., of Tokyo. It was in the late 1940s
that the Enya brothers began making model aircraft engines, initially the robust 10cc class Enya 60 and 63, then, in 1950, the first of a long line of Enya 19 models. Currently, the Enya range is one of the world's largest. It comprises no less than 43 throttle-equipped models……"

(Quote from Peter Chinn's Engine Test of the Enya 2IX-TV, AeroModeller June 1982)

In the March 1968 issue of Model Airplane News there appeared the only known article specifically on Enya, entitled "Evolution of an Engine", translated by Ryicki Honda. The very first sentence reads…"The first Enya engine emerged in 1948".

*** Note:** Its very interesting that Chinn admits that he knew about the forthcoming 5224 engines at that very early point in time, as the implication is – the later Series of 29's & 35's were obviously at an advanced stage on the drawing board at the ***same time*** as the brand new 35-II was first hitting the shop shelves. Its very tempting to speculate that maybe, even as the first shipment of 35-II's was leaving Japan, Saburo may have realized that, from an economic point of view, it would be more advantageous to have a 29 & 35 sharing a common set of basic parts, rather than a 35 & 45. This could explain the relatively short life span of the 35-II Model 600I, an otherwise excellent engine. The sales of Enya engines in the States too, only really took off after M.R.C. became the US Distributors (***see below**), and that was after the 35-***III*** had arrived. M.R.C. therefore (and certainly, I can find no proof to the contrary) must ***never*** have marketed the 35-***II***, which was another nail in its coffin. This is a tad strange, as the 35-II was in production for more than 12 months before the first variant of the 45 arrived, yet M.R.C. opted to sell only the later 35-III alongside the "bald head" 45. The implication here is that the factory ***must*** have had excess stocks of the earlier 35 to move, and either the manufacturer

and/or M.R.C. had decided that the 35-II was dead in the water. On the shop shelves at the same time was OS's admittedly beautiful and excellent Max III 35, and it was generally sold at a lower price than the Enya 35. Modelers at that point in time were still gripped by the same attitude that prevailed a decade earlier ie. they wanted the maximum bang for their buck, so the Max III got the nod at the Enya's expense. Attitudes *were* changing however, and by 1964 OS had released their much milder Max S 35, aimed squarely at the C/L Stunt flyers. The Max III 35 was now officially branded as "too hot for stunt", being more of a Combat engine. The irony, of course, was that the Enya 35-II was a World Class stunt engine all along!

*__from M.A.N. July 1964__, "Another visitor at the office this month was Bill Eccles, manufacturers representative. Bill was in to talk about one of his accounts: MRC-Enya. Bill tells me the response to the Enya engines is astonishing. Interest is at all levels, consumer and trade. The fact that the engines are completely supported with spare parts could be the reason for this acceptance."

Re. the sand-cast engines (19, 29 & 63 / 60) they all suffered in varying degrees to the usual shortcomings of this casting process, ie. the surfaces of the mounting lugs were rarely planar with one another. As well, the two smaller models could have inconsistent thickness of the exhaust stack (usually thinnest at the upper rear) depending on how well the "plug" was placed before casting. Most of these early models have a variance (top to bottom / end to end) in the thickness of metal in that area, and one 19 we have was so thin at one end of the stack, that the metal had actually just broken away. The 3-bolt 19's also tended to have very loose threads in the glow plug hole (tapped directly into the alloy head casting) so beware of over-tightening and stripped threads! This applies also to the Red-Head 29.

Re. the twin-needle throttle valve, as fitted to the 45 & 35 Model 600I with plain bearing -
"As regards carburetor design, there is an increasing swing towards throttles incorporating automatic fuel metering. Designer Saburo Enya had just such a system more than ***8 years ago*** on his twin-needle carburetor fitted to the 35-II TV and original 45 TV engines. It was discontinued because, at that time, the average R/C modeler seemed unwilling to cope with more complex carburetors". (Quote from **Peter Chinn**, Engine Review Enya 60-III, MAN March 1970)

Its complexity at least rewarded its owner with a safe idling speed about half that which could be achieved by its contemporary rivals, the Merco 49 and OS 49 (1,500-1,800 rpm instead of 3,000). Advanced technology for its day!
Also, just a word of caution here regarding Enya (and OS!) glow plugs. Neither brand is strictly a "long" ***or*** "short" reach (7/32 in. & 5/32 in. respectively) but an in-between 3/16 in. size. This means that one has to be careful when fitting long plugs (eg. FOX R/C type) to an Enya, as it is possible in some models for the piston to strike the end of the plug, obviously with dire results!

"All the crossflow-scavenged Enya 29's have been closer to 0.30 cu. in., rather than 0.29. They all use a nominal 18.7 x 17.9 mm bore/stroke, which equals 4.916 cc or almost exactly 0.300 cu. in." (**P.G.F. Chinn** quote). In early 1955 though (when examining the 5002 which he had just received) Peter quoted the bore & stroke as being 19mm X 17mm, for a capacity of 4.82cc, but this was only what was quoted on the factory sheet. In December 2009, Adrian Duncan examined closely a sand-cast 29 with red head, which was part of the late Ted Enticknap's extensive engine collection. This particular engine appears to be a Factory Special, probably built especially for Ted (a very influential US modeller in the early 1950's) as it has been over-bored to a nominal 20.4 mm, giving a displacement of 5.368 cc or 0.327 cu. in. This work has been too professionally carried out to be a "home made" job (**NB.** I myself have a Torpedo "Twin-Stack" which belonged to Ted, and compared to my ***six*** other "Twin-Stack's", Ted's is obviously a "Presentation Grade" special, as the fits & finish are way above normal standard). It

would seem that if a modeller had **a**) enough money, and/or **b**) held in high enough esteem, that he could prevail upon an engine manufacturer to create whatever was specified.

Excluding the "small" Enya's (ie. those with a screw-in cylinder) and the very early pre-production types, there was never a series production ***rear induction*** Enya of any size, except for the 1990's 60XLRV designed mainly for Marine use, but also made in small numbers as air cooled R/C Pattern power-plants (FIRE designated 60-XL Model 7202). Also, there was never an Enya 09, 15 or 19 that had anything other than a 4 bolt cylinder head, the very first 19 being unique in having a 3 bolt front housing, sharing this feature with the Haru .55, another early Japanese type.
Strangely too, (unlike their rivals over at OS) Enya never made an engine with an offset glow plug or an ***iron*** piston engine with ***skirt ports***. Well at least, that's what we ***thought*** until June 2010, when Pat King bought a couple of 29-III's which were originally purchased in Japan in 1958. Both these engines have **huge** piston ports, not like the 2 round OS type, but *singular* and *rectangular,* which is most unusual. We are left to ponder whether they were left-over parts from Mr. Fujimuro's R&D bin or whether they were one-off "Specials" built for a customer. It is apparent that, in later years especially, the factory kept some engines for the home market only eg. a GP 45 CXL (sighted on eBay) with AAC, rear exhaust and geared fuel pump. In 1978, Don Sohn and Bob Bowen assembled a small quantity of horizontally opposed "Bantam" twins (.60 size, in both glow and spark ignition) using Enya 29 Model 5224 components – cylinders / pistons, heads & carbs. As you would expect, with 2 Enya 29 size pistons going over TDC together, these engines have impressive compression! A flat four has also been sighted, but its unknown if this was made up from Enya parts as well. As was stated earlier, the very first (3 bolt front) Enya 19 seems to have come out of left field. The much later CX 11 could also be regarded as an oddball, as it was not only an unusual size (2cc) but it also featured both (initially) AAC metallurgy, later ABC, twin ball races, as well as being made in both glow and Diesel versions !

It's a testament to Saburo Enya's refusal to accept 2nd best, in that he chose AAC (or Al-Chrome) metallurgy for his Schnuerle ported engines, rather than the cheaper, much heavier and inferior ABC style of piston/liner construction. The first thing you notice about Enya's composite metallurgy is, it doesn't have that ridiculously tight "squeak" at TDC like some ABC engines. This of course, is due to the fact that the metal in the AAC piston is the same (a high silicon content aluminium alloy) as that of the liner, so the expansion rate in piston and liner remain the same, regardless of temperature. The opposite holds true for the ABC engine – as the temperature increases, the brass in the liner expands more than the alloy piston does, and consequently, there will be a loss of compression when hot. Conversely, that is why the "squeak" is there when the engine is cold, the theory being that when the engine has reached its operating temperature, the piston fit should be optimum. If that wasn't enough, the fuel used in an ABC type engine will also have an influence on the piston fit. A high nitro fuel will obviously generate more heat in the upper cylinder area, hence more liner expansion, hence sloppier piston fit, thus an ABC engine designed to operate on high nitro fuel will need a much tighter "cold" fit at TDC than one intended to operate on low nitro. None of these problems exist for Enya's alloy piston running in a chrome plated alloy liner, the real bonus being a considerable saving in weight over the brass liner.

Further to the above, another aspect of Enya engines in general, and one which is often taken for granted, is the overall ruggedness that Saburo built into their basic design, even in the early years. This sets them apart from other brands emanating from Post War Japan, where engines could sometimes be very fragile and flimsily made, including the early OS 29's & 35's. As an American tester noted in 1962 – "You could never call the Enya 45 fragile." This comment was relevant to all Enya's, the 6 bolts especially. As Chinn put it, "The Enya 60 is surely one of the toughest model airplane engines ever built." I cannot name any of the "bigger" Enya's that could be regarded as flimsily constructed.

The "Small" Enya engines ie. 049, 06, 08 & 10

Why did Enya have such a proliferation of small capacity engines? The "small" Enya's were the work of Yoshiro (youngest of the three Enya brothers) and whilst they ran quite well, they were obviously made "down to a price", rather than "up to a standard" like the larger Enya's. That is not to say that they were shoddily made – far from it. The thinking was more "budget" or "no frills" (as an example, all the crankshafts ran directly in the light alloy case, rather than in a bronze bush). They also did not suffer from a lack of power – the 08, although 0.22 cc smaller than the hot little 09-III, is still quoted as having equal power output, as well as being almost half an ounce lighter, possibly pinpointing the main difference ie. maybe being less rugged than the "big" Enya 09. All of the "small" Enya's, with the possible exception of the very first reed valve 06 glow and Diesel, and of course, the 09 (ie. 049, later 06, 08 & I0) were intended mainly for the home market, and were only offered for sale outside Japan very sporadically. They *may* have been intended for use in model air-boats & prop driven cars, as these are depicted on the included (mostly Japanese language) safety instructions, ***or*** maybe they were just trying to compete with Cox in the small engine home market. The most obvious visual difference between these small engines and the 09 and larger sizes was the 360 deg. exhaust porting (meaning of course, that they all had flat top pistons, devoid of a baffle), a non-detachable front housing and the engine size nomenclature which was cast onto the bottom of the crankcase. The material and process used to make the piston's in these little Enya's would appear to differ from the bigger ones too – shiny metal, Cox like, with no visible machining or *lapping* marks (these were never claimed to be "Hand Lapped"), and internally, they utilized a circlip retained thimble or carrier in the piston for the gudgeon pin.

Another "trademark" of the small Enya's was the NVA, which was always un-plated brass and rigid, never flexible. As well, all the later ones had cast-in radial mount facility in conjunction with the usual beam mounts, the earlier ones with a detachable, bolt-on stamped metal radial mount. Several photo's of Yoshiro and his models powered by these small capacity engines appeared over the years in various magazines. In MAN August 1966 he was reported as flying an R/C model, powered by four Enya I0-TV engines! The very first throttle equipped small Enya was advertised by I.M.I. in the States when they listed, in January 1961, a 06 glow with TV. This consisted of a simple butterfly valve in the venturi tube, which then had to be extended back about double normal length so the wire operating arm did not foul the optional anodised alloy radial mount, when utilized**.** The later TV versions all had carburetors specific (and stamped) for each size. Early models had vertical intakes, later ones with venturi angled forward to clear the annular muffler. In his 1966 Global Engine Review (as well as numerous other times over the years) Chinn stated that several of the small Enya's "are not handled by the official U.S. Enya importers," but that the 06, 08 & I0 models were released onto the Japanese home market "early this year" (1965). While spare parts for these "littlies" never seemed to appear outside of Japan, strangely in late 2009 some **did** start to appear on eBay (mainly just NVA's). Unlike the larger engines, most of the small Enya's came in a 2 piece, plastic bubble box with a clear lid, although much later versions came in the black/red factory box. Rather strangely, and as far as we know, no Engine Test was ever done on a small Enya, at least in an English language magazine. After all, they have been around for half a century, and reasonable numbers must have been sold, especially in their homeland. The later throttle units appear to be quite unique, and an expert's evaluation on these in particular, would be most interesting. Rather incongruously, a factory sheet which came with an SS 40 BB purchased in 2005 depicts & lists the 049-IITV, 06-IITV, 08TV and the I0TV! No mention is made however, of these 4 in the specification columns, suggesting maybe (once again) that these engines were, at that time, still available in Japan but not exported to the West.

*(The following excerpt from **Flying Models** magazine, August 1966. Author **Jack Sheeks**)*

“The “Demon” is a little on the large side, with a 57” wingspan and an all-up weight of 57 ounces. I originally installed a Fox 40 (old type) but I recently acquired a new Enya 35 III. We have tested just about every engine capable of pulling a stunt ship, and before we run a new engine, we always tear it down and remove any burrs or irregularities in the casting. However, this Enya was as clean as a whistle. The fit on the piston and sleeve was as close to perfect as you could ask for, with a beautiful casting too. Very seldom do you find a new engine this clean. Instead of hand lapping the engine in as usual, we decided to run it in, mainly to see if it would seize up, and how long it would take it to break in. We used Fox Superfuel and a 10-6 Top Flite prop for all the testing. Much to our surprise the engine didn’t seize up on any of the runs. We started out by running the engine at a fast four cycle for the first five runs. Then we stepped it up to a two-cycle for a continued run of 10 minutes. By this time we could feel and hear the engine picking up more power. As you know the engine comes with three venturi plugs, numbered one, two, and three. Number one is recommended for stunt or sport flying. Number two is an intermediate deal, a little more power but very controllable. Number three plug is for rat-racing, combat or speed. It also comes with a pressure fitting and a high compression head. We used the low compression head and the number two venturi plug, without pressure. After our initial break in period, we decided to see how it reacted in the air. Out came dear old “wife trainer” for test purposes. The more we flew it the better it ran, it is a good engine, and capable of doing anything we wanted. It was decided to try it out in my pride the “Demon.” This took a little conversion, as the shaft on the Enya is a little longer than that of the (Fox) 40. It was worth the effort because it pulled the 57 ounce airframe all over the sky. I like this potent powerplant very much, and I have another ship under construction now that was designed especially for the Enya. If it works out as well as we plan, you may see it at the Nats this year. We hope everyone who tries an Enya has as good luck with their engine as we have with ours.”

Personal email from Jerry Asner (May 2008)
“While in the military I furnished Mr. Enya with platinum iridium wire that I was able to obtain through my military address. Mr. Enya used to go to work on a bicycle with a 60 mounted on his front wheel via a spring and flywheel. When I started an import-export business Enya made engines for me with English threads both prop and assembly. I worked my tail off promoting them (Eureka Importing Co.) but was unable to stop people from buying them in Japan and selling them retail direct. When a storm wiped out my inventory of kits and engines I quit.”

Glow plugs were manufactured by Enya in at least six different types, the very early No. 1 & 2 plugs had a nickel-chromium element (ni-chrome) for use with 2 volt wet cells, and identified by a black body with gold top. The later ones (No.3, 4, 5 & 6) were all 1.5 volt platinum alloy (platinum-rhodium) with No 3 the hottest, No 6 the coldest. Interestingly, Enya never made a glow plug with an idle bar, nor did they recommend the use of these in their R/C engines. The early Enya plugs (shiny plated) had taller tightening flats than the latter day ones. Goro Enya incidentally, was in charge of the platinum & glow plug department, the high cost of platinum being reflected in how much was used in each plug size ie. No 3 the cheapest, No 6 the most expensive.

In the June 1962 issue of American Modeler, it was stated that “Not too many years ago most products with a “made in Japan” label were considered inferior to ours. However, with the establishment of an ***exporting bureau of standards*** by the Japanese government, many nations would now find it pretty tough to better their standards.”

Bob Allan June

2010