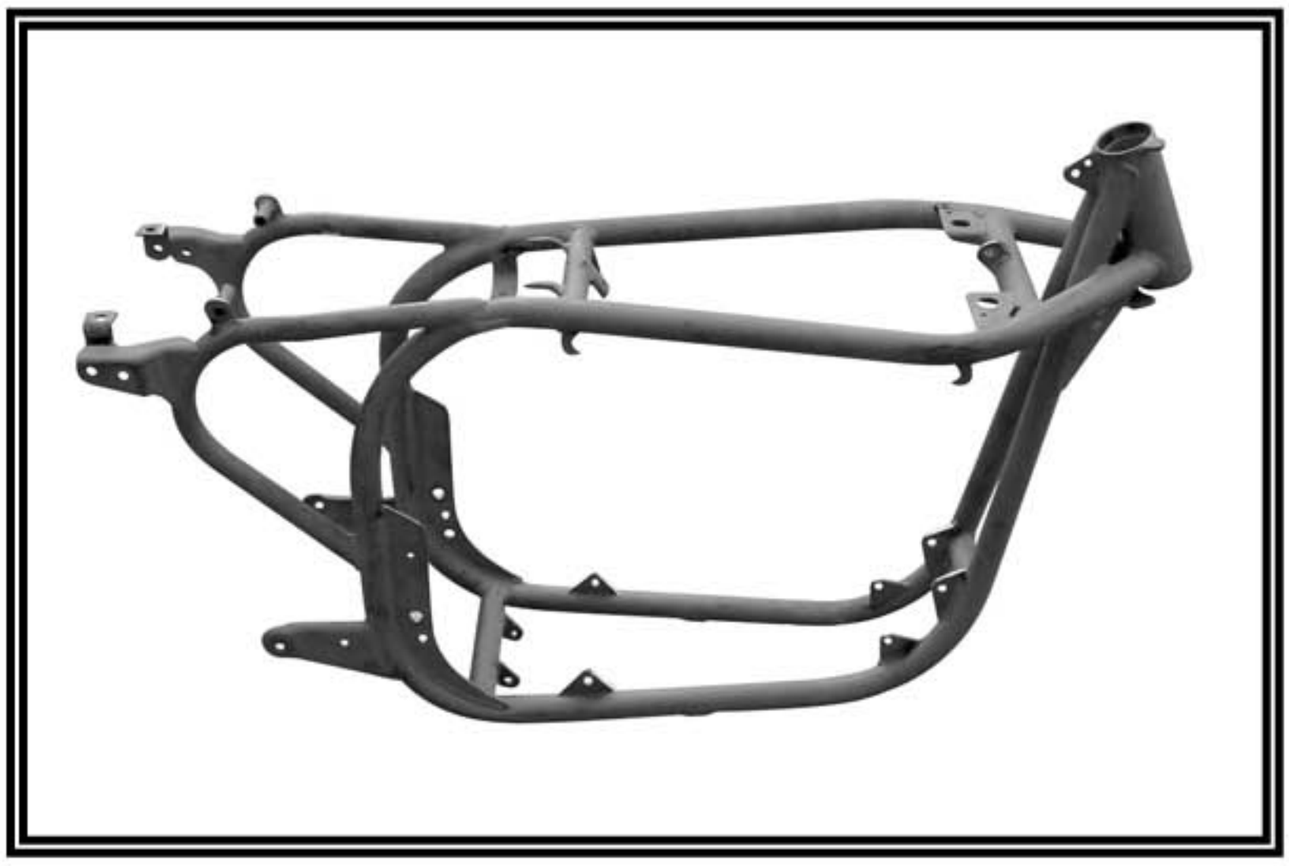
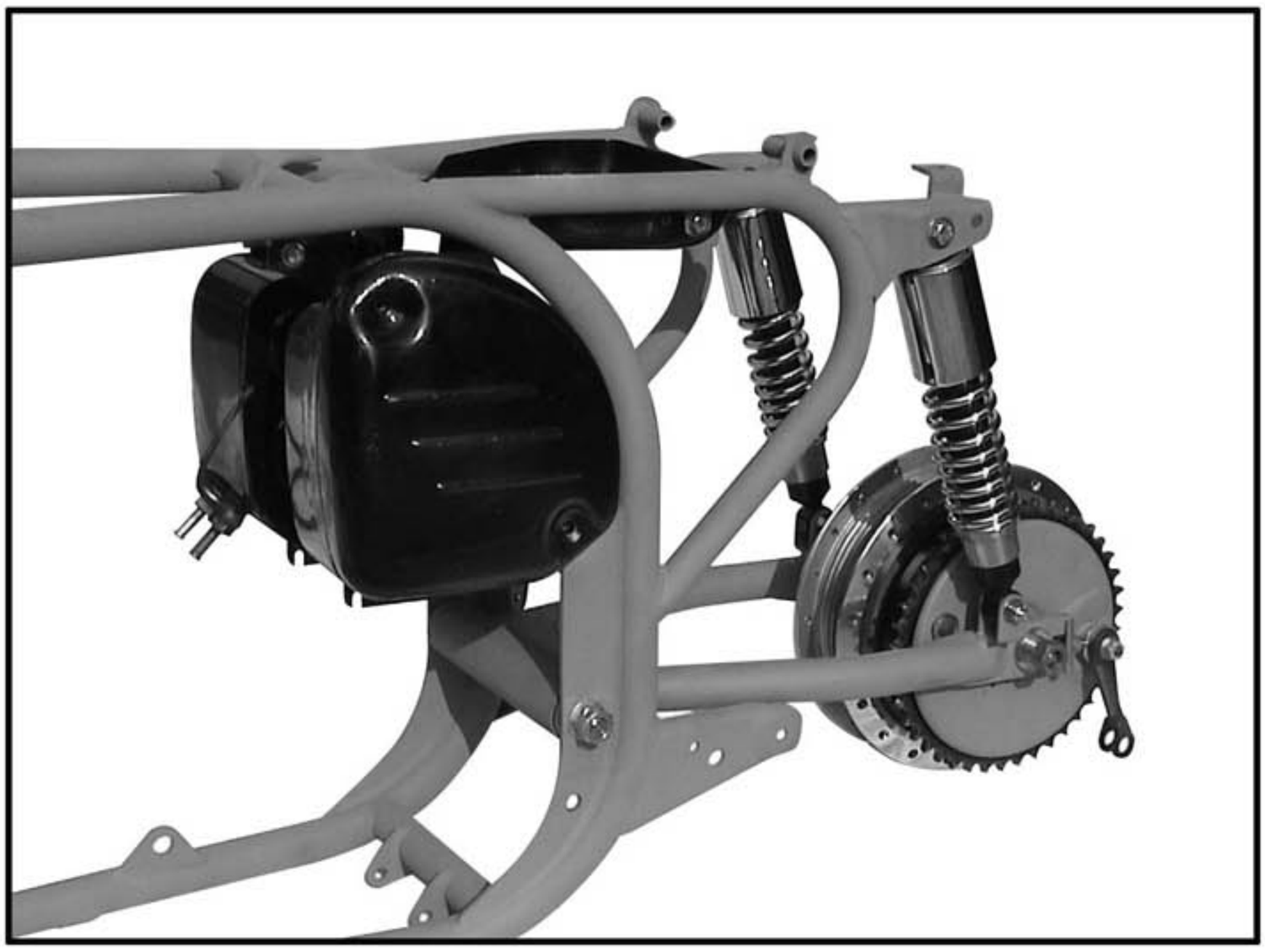


Building a "Featherlastic" Norton Part 1

by Bob Cox

This project began like I'm sure many do as an "accident" when I picked up a bunch of Commando parts in a garage sale. Included was a complete Combat engine which appeared to be frozen up thus my purchase for 50 bucks. It turns out the engine was not frozen but in need of a rebuild. It also must have been raced as it was full of titanium valve gear and had much metal removed from the rockers and crankshaft. So much was gone from the crank that Ralph Delmar suspected it to be some kind of dirt track set up - a quick revver without concern for "balance factor". Needless to say, I am rebuilding with a stock Norton crank because I am also utilizing Commando isolastics which are designed for vibrations at certain rpms. Captain Commando can tell you what happens when you alter the balance factor. So here I have a perfectly good engine, well good for a complete rebuild at least, and it has to have a motorcycle underneath it. As I've already built two Commandos something different was in order. I was impressed with a couple of "featherlastic" specials that I saw at the Red Rock Rally in Utah the summer of 2000. AMR Motorcycles of Arizona had succeeded in marrying the Commando engine into the slimline featherbed frame while retaining the isolastics and keeping the swingarm solid to the frame. The Commando mounts the swingarm to the engine/tranny/subframe which can be done on a featherbed but with a loss of rigidity. Now if you could get the performance of the Combat and the handling of a featherbed into the same package you would really have something - a ton up hands off classic that won't vibrate you to death. This is my intention with this special. It's also an easier sell to my wife as the motorcycle will just slowly appear in the garage (put that line in small type, Phil).

I have the engine well under way to completion, head being breathed on by Les Emery in England, bottom end together, cylinders honed by Mr. Delmar. I've built a tranny from parts also obtained from the garage sale. After many attempts at purchasing a slimline frame on e-bay, lo and behold, it practically showed up at my doorstep when Jack Herneupont arrived at an NTNOA meeting with one in the back of his El Camino. Front end is being sorted with Commando sliders, Atlas fork tubes and a TLS brake/wheel from Keith Martin. Swingarm is an aftermarket unit from Mick Hemmings that accepts wider tires. Rear hub is Commando. I hope to have the frame with swingarm and rear hub assembly ready to go to Arizona in the next month or so. In the meantime, I'll keep looking for parts and shopping the internet for more information and the many trick items that fit the featherbed frame. Stay tuned.



Building a Featherlastic Part II

"The Featherlastic Frame"

Finally I have reached the point where I'm ready to ship the featherbed frame, swingarm and rear hub assembly out to Arizona for the featherlastic modification. They also require an isolastic front motor mount which is shortened to fit the narrower featherbed downtube area. I have chosen to utilize a slightly modified Commando rear hub which retains the cush rubber drive versus the solid mountup of the Atlas and earlier versions. Since I am using the Commando clutch assembly (which has no cush rubbers) this is easier on the transmission especially when combined with a belt primary drive. Other options for the rear include the popular Triumph conical hub which can be made to look similar to the original Manx unit, or a modern reproduction of the Manx itself (mucho dinero). By sticking with the Commando (which for the most part is identical to the Atlas) I am keeping the bike in a style typical of one built back in the 70's. Plus I'm clearing out some good spares left over from my previous two Commando projects.

Also in keeping with the classic Norton featherbed cafe look will be an Atlas headlight shell (which I need to locate in case FYI) and Atlas lower fork yoke. The top fork yoke will be an alloy unit from England designed for clip-ons. I've also decided to use the stock Atlas oil tank and battery box as I like the way it works with the rear down curves of the frame, and again its a classic look versus the more traditional Triton cafe central oil tank. I was lucky enough to purchase a complete unit from a gentleman in England who s also building a Norton Cafe. Where I am beginning with a bare featherbed frame and keep adding on Atlas parts and tinware, he is stripping a complete Atlas motorcycle to get to the frame. Also of note is that he's building a Commando 850 with solid mounts and a 76 degree crankshaft (made from solid billet) which is supposed to create a smooth running Commando engine. I'll keep you posted on his project as we stay in touch.

While the frame is in Arizona being modified, I'll next begin building the engine. All components are complete and ready for assembly so stay tuned for Part III and the completion of the Combat 750.

Building a Feather-Lastic PART III

After completing the frame assembly with required parts, I turned my attention to getting it to Arizona, safely and reasonably. The best way to do this was to build a crate. I know that shippers will treat your stuff much kinder if you make your shipping container shipper friendly. I installed handles and bottom skids for the forklift and kept the weight down. The frame with assembled rear swingarm, hub, oil tank and battery box is nestled in 4" of styrofoam and polyfoam on all sides.

I found a shipper through the internet who would deliver from terminal to business doorstep for $132. Turns out the drop-off point was 5 minutes from my Irving office. I'll use the same shipping service for the return trip again picking up the crate at the Irving shipping depot to save money.

While waiting for the frame to be modified at Alternative Motorcycle Repair, I've completed the assembly of the Combat head. The head has been flowed by Norvil Motorcycles of England as well as a rebuild including "vapour blasting". This type of blasting suspends glass beads in a liquid which cushions the impact and creates a finish similar to the original. It also closes the pores in the alloy making it more stain resistant. I've had the same treatment done to the crankcase which is next on my list for assembly. One last note is the excellent NOS timing cover I picked up from Bob (Doc) Storm. It's a real bonus to have a source for Norton parts, new, used and NOS, right here in our own backyard not to mention the many great stories that Doc has to tell.

In Part IV I'll report on my trip to Tucson to give the finished frame a good look over, and talk featherlastic shop with a couple of founding "Floggers"*. I'll also get a chance to ride a Feather-Lastic!/Bob Cox

* F.L.O.G. (Feather-Lastic Owner's Group)

Building a Featherlastic Part IV

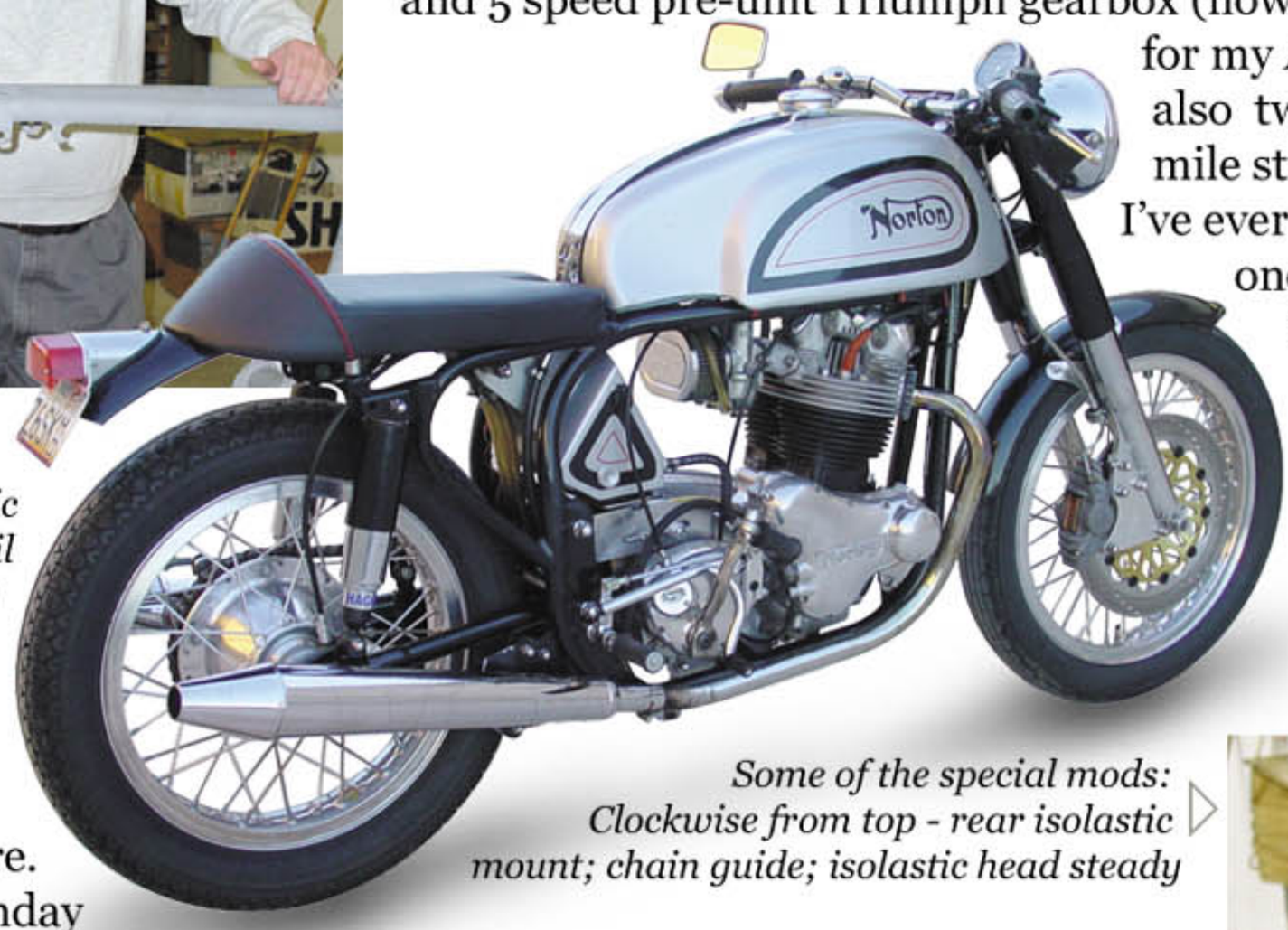
In Part III, I shipped the featherbed frame to Alternative Motorcycle Repair in Tucson, Arizona for the owner, Mike Haracourt (top photo), to work his magic. With the mods complete I then headed out West to give the frame a good look-over, and take a ride on a Featherlastic or two.

Take your pick... decisions, decisions

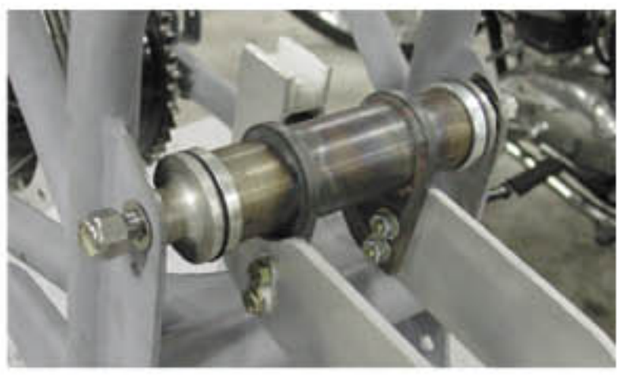
You may know AMR for its Nortech anti-wet sump conversion for Commandos. This involves adding a check valve to the timing cover to minimize oil draining back into the crankcase over time.

I arrived in Tucson early Saturday afternoon and went directly to AMR which is conveniently near the airport. There I met Mike and Randy Ullery (bottom photo) who together have developed the Featherlastic concept. After looking over my frame and talking shop, our attention turned to the morning ride where I'd get to experience two different approaches to the Featherlastic.

Since we had to drive down south a ways to meet up with Randy for the ride, Mike took me to one of his top customer's place to select my interim wheels. From eight 850 Commandos I chose a bright red roadster which Mike had restored to perfection. Life is tough. We met up with Randy where I then traded bikes with Mike. Mike's Featherlastic utilizes a Combat 750 engine and 5 speed pre-unit Triumph gearbox (now I want a Quaife 5 speed cluster for my AMC, ouch!). The front end is also twin-disc Triumph. The next 20 mile stretch of road was the biggest thrill I've ever experienced on a motorcycle - one turn after another, up and down hills with positive and negative G's galore. On a Sunday morning about the only thing out there besides us were the Border Patrols. Mike's F'lastic was extremely smooth and responsive, and the isolastics worked to perfection. This was my first ride on a featherbed frame and all I can say is that it felt like I was on rails. At a favorite watering hole at the end of the trail we met up with Mike's wife and business partner, Kas, who was on her neat Triumph TR-6R. I took the return trip on Randy's 850 Commando-driven machine. Its wide power-band and solid handling made this ride a blast. My trip was too short but Mike, Kas, Matt (Mike's son and chief assembler) and Randy extended great hospitality and made every minute count. Muchas gracias amigos! *Bob Cox*



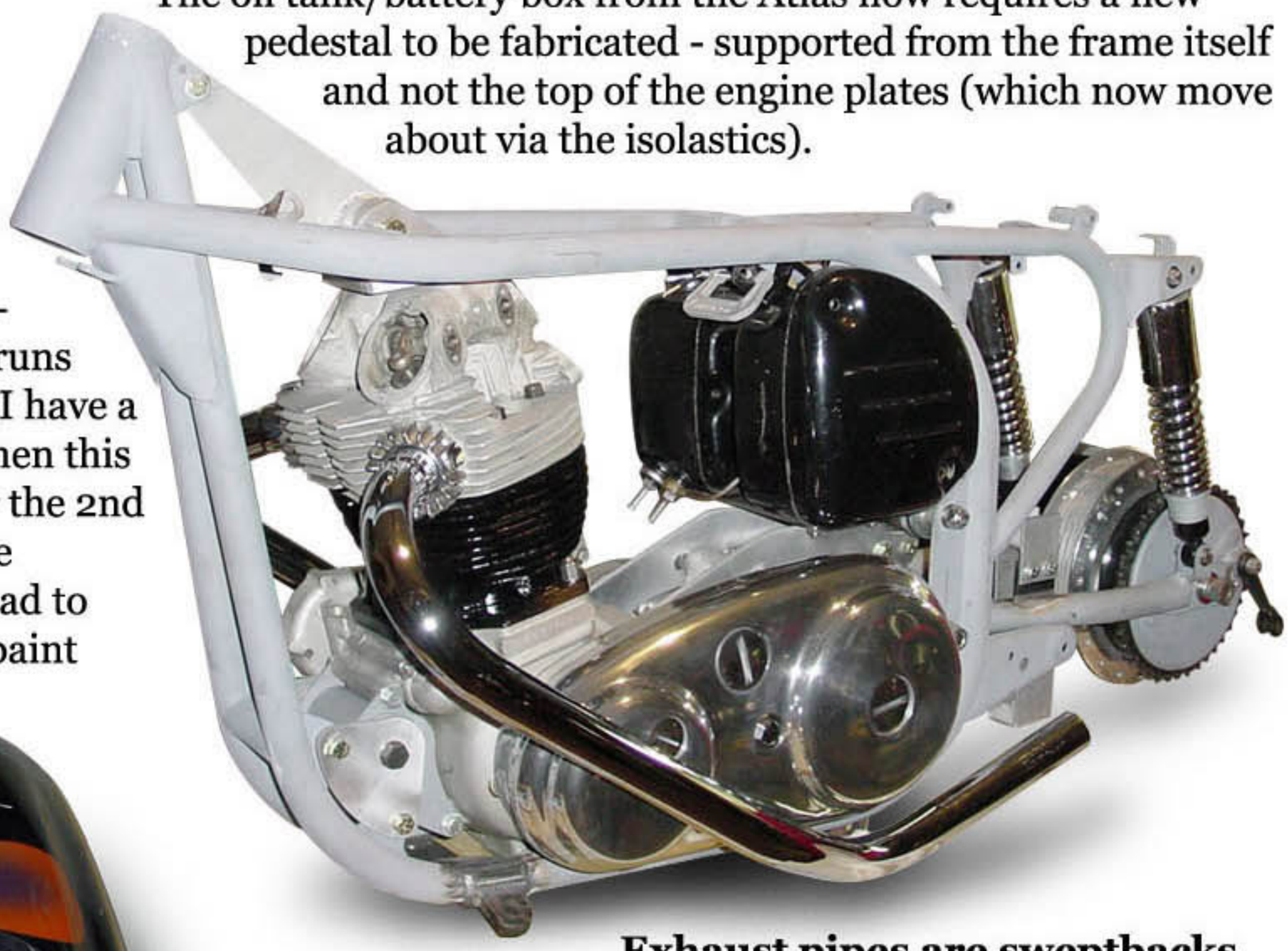
850 F'lastic with Norvil single disc front end



Some of the special mods: Clockwise from top - rear isolastic mount; chain guide; isolastic head steady

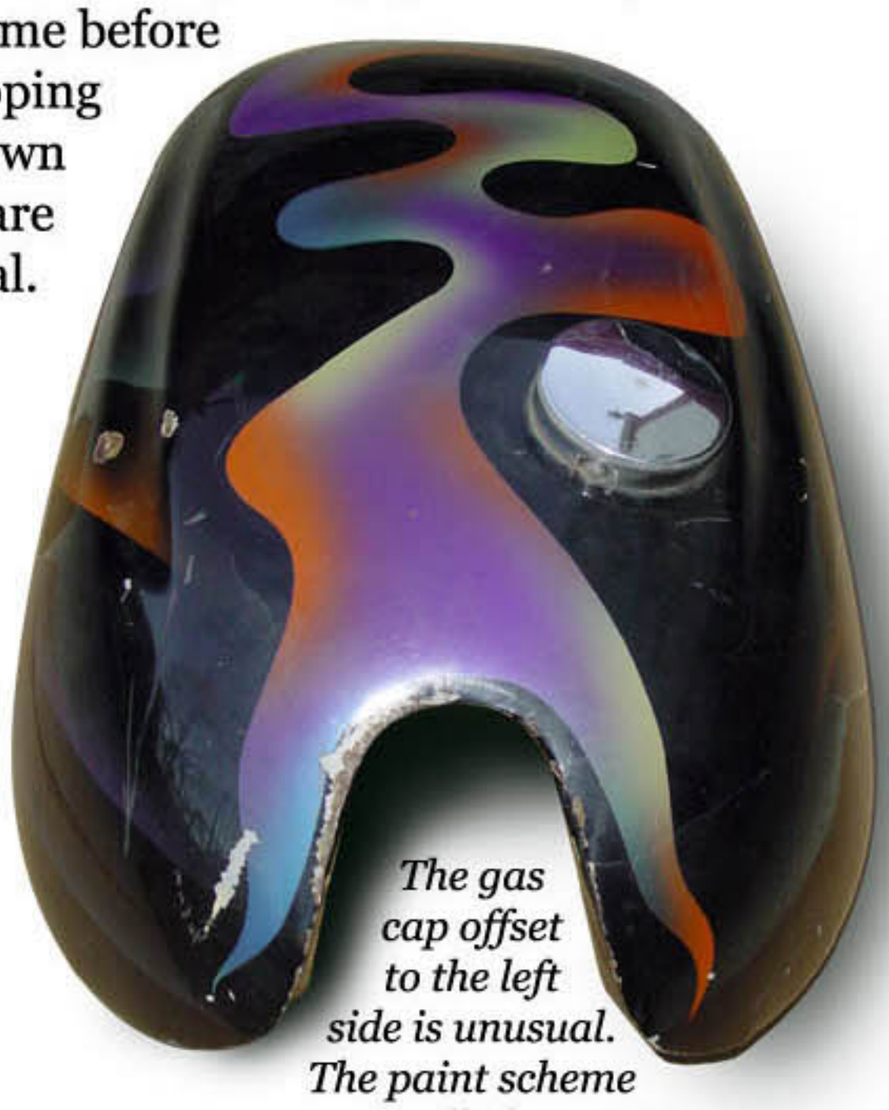
Building a Featherlastic Part V

Part IV dealt with my trip to AMR in Tucson to inspect my modified frame, and experience a couple of Featherlastics first hand. The frame now safely home in Coppell, I begin to install the main components or at least the ones I have. The entire Commando power train goes in beautifully with just slightly less forward tilt than the stock Commando. The oil tank/battery box from the Atlas now requires a new pedestal to be fabricated - supported from the frame itself and not the top of the engine plates (which now move about via the isolastics).



Exhaust pipes are sweptbacks from Clubman Racing

While I sorted out the various bracketing I'll need to build, I continued my search for missing components, namely the gas tank. A steel item was recommended by Mike at AMR and he runs a stock Atlas tank on his f'lastic. I have a preference for small tanks and when this Manxman showed up on ebay for the 2nd time in a year, I bought it with the "buy it now". Needless to say, I had to record the very 60's psychedelic paint scheme before stripping it down to bare metal.



The gas cap offset to the left side is unusual. The paint scheme was, well "far out!"

Other items in my search list include a rear fender and an original Atlas headlight shell. While I intend on upgrading the headlight internals, I still want to keep this bike as Norton as possible and street legal. Keith Martin at RPM was glad to hear it had a late (classic) model Triumph cast iron centerstand as he's not particularly fond of the Norton design. I must admit that it is an improvement over the centerstands on my Commandos.

In the "to be purchased new" list are... a seat, with a cafe hump of course... rearsets... clip-ons... and wheel rims.

A major goal of mine at this stage of building was to finish work on my wheel hubs - the Commando rear and a sweet scooped TLS Commando front drum that I found on a shelf at RPM (thanks Keith). The original textured casting of these ribbed hubs is really hard to keep clean so I looked for a new approach. I've seen the centers polished but then you have to re-polish them after they're laced. What a pain. My solution - file and sand out the casting imperfections then powder coat the center ribbed sections in gloss black. To contrast, I polished the outer edges of the hub flanges where the spokes lace. In Part VI, you'll see this bike as a rolling chassis as I start my final build. One of many"final builds" it turns out.

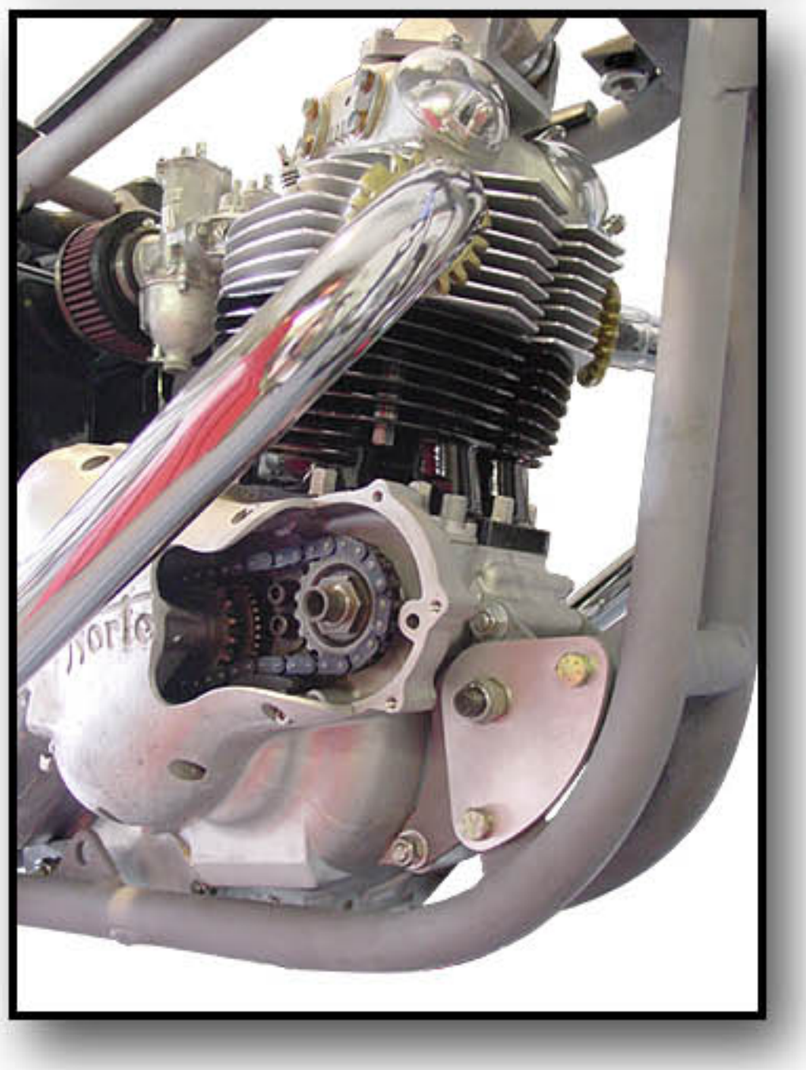
Its hard to beat the simplicity of the Beck Arnley tail light, another 60's icon, courtesy of ebay

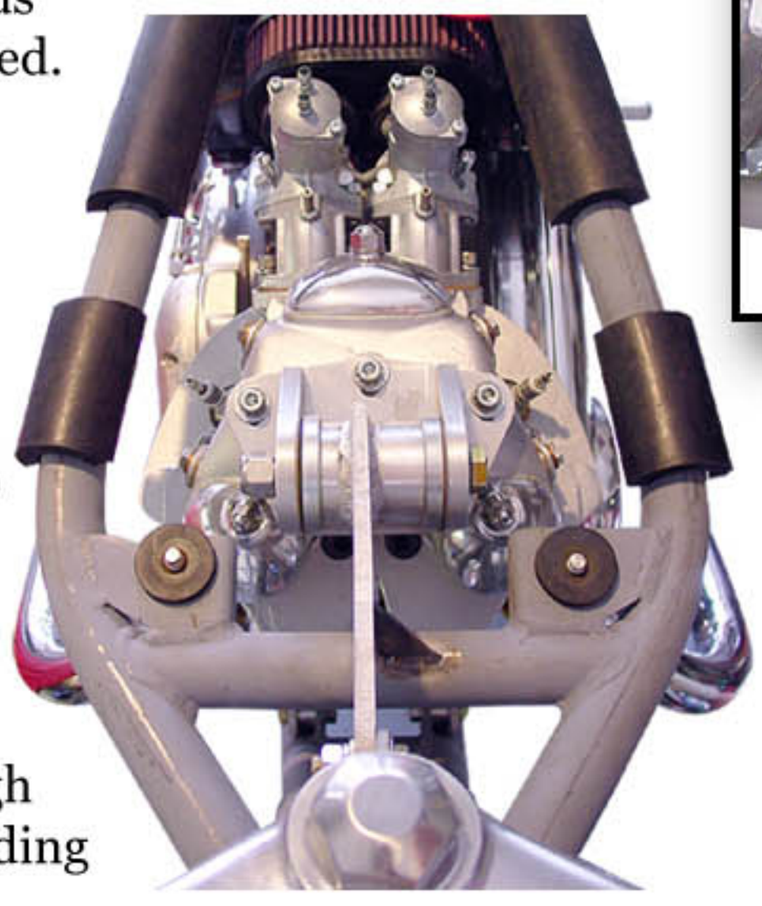
Building a Featherlastic Part VI

It's really starting to come together now that I have all of my main pieces. I went through rear fender wars - an undrilled Commando steel item purchased on ebay - too big. An alloy "Manx" style from Unity Equipe - too light, plus they bash a "Guiness Kiss" in the front to clear the rear engine mount. Nope. So back to RPM and a scrounge on Keith's Norton shelf. Viola! A perfect sized & shaped steel fender, made in England, and not too many drilled holes to weld up.

The front hub I sent to Central Wheel Components in England for lacing to a Morad (Akront mold) alloy shouldered WM3 rim. I also purchased a matching rear rim (WM4) and spoke kit. Lacing of the rear was done by Steve at RPM in the frame since the spacing was so critical - with a slight offset to the right.

With the wheels complete and all the little spacers, washers and seals figured out, I then mounted my actual engine. The timing cover shown is a cutaway item I made from a spare - a handy tool for setting cam chain tension precisely. I'm also using an automatic cam chain tensioner which just happened to be in the Combat motor I rebuilt. This is the same one you see advertised in classic bike publications. Very cool. The Combat motor seems right at home in the featherbed frame. Of course it is a first cousin not to mention the generous engine space offered up by the f'bed.





Another nice advantage of the featherbed frame is the access it gives you to the engine. The head drops right down between the rails and makes the tricky push-rod juggling act of the Commando frame a much easier process. And just look at the access to the carburetors, which are new Amal Mk I 32mm Concentrics from Norvil Motorcycles. I went through two alloy humped seats before finding the right one (Unity Equipe). Of course it was designed for the wideline f'bed so I took my Dremel tool to it. A little TIG welding by Brink RaceCraft and now it fits the frame perfectly. In my next article I sort out all of those dang brackets./BC

Building a Featherlastic

Part VII

Boyer Powerbox mounting bracket

Okay, I'll admit it. Brackets are not the most exciting or often even visible part of a special. But in many ways they can make or break a project such as this one. It seems like I've been making brackets from the get go and I'm still not done. And it's not unusual for me to have to make them two or even three times before I finally get it right.

Beginning top right are the following: **1) Coil/horn** bracket - Yes that's a Harley aftermarket coil that makes a little hotter spark than stock Lucas and tucks under the frame nicely. Horn mounts to stud; **2) Boyer Micro Digital** Electronic Ignition bracket "sandwich" **3) Oil filter** bracket - The filter mount is part of a Norvil kit as used on the Commandos and the bracket is welded to the square post that supports the Oil Tank/Battery Box platform; **4) Rear fender front** mounting bracket - This is a long "W" shaped bracket that jogs over the rear isolatic assembly; **5) Seat & rear fender** top mounting bracket - This "U" shaped item serves a dual purpose with the seat/hump attachment similar to a pre-MKIII Commando (only it's hidden).

Top to Bottom:
1) Modified Pan,
2) Foam added for reference
3) Finished seat

The evolution of the seat began with a stock Unity Equipe alloy "wideline" unit which I modified to follow the contour of the "slimline" featherbed frame, and extended. Next I cut foam to approximate the desired shape using a serrated knife. Finally, the finished seat with high density foam and a tuck & roll leather cover expertly crafted by Bobby Ellis at Custom Auto Design in Fort Worth. In Part VIII, I paint the bike in my computer before the real work begins.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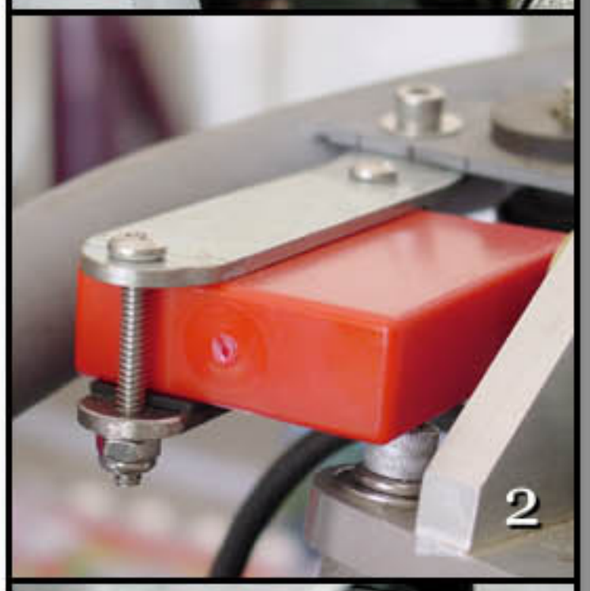
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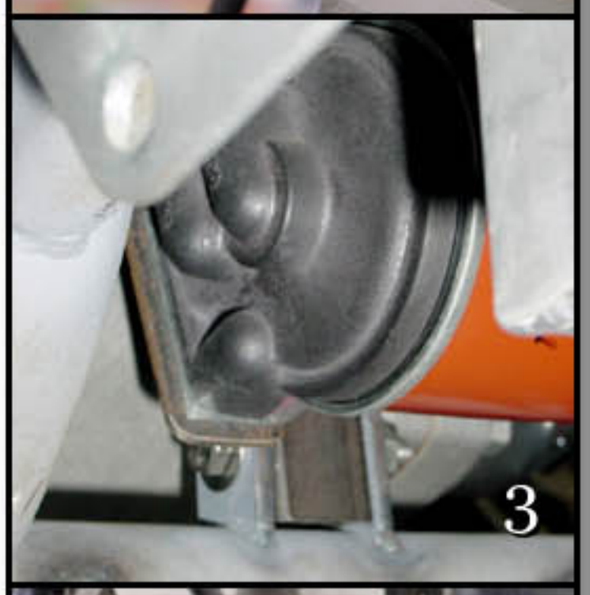
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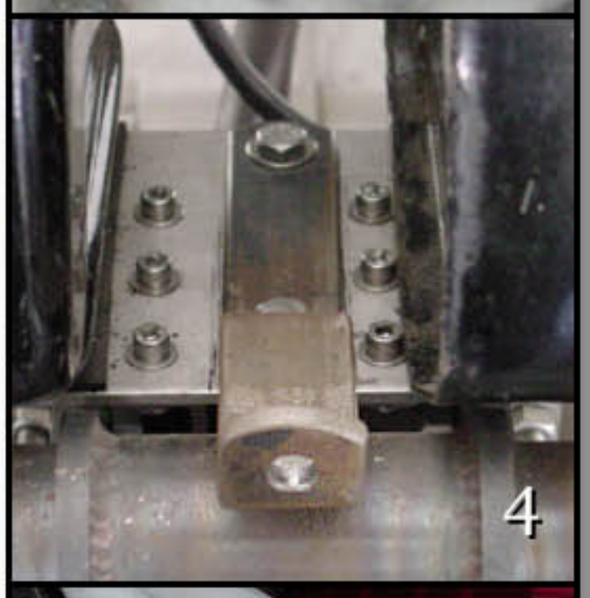
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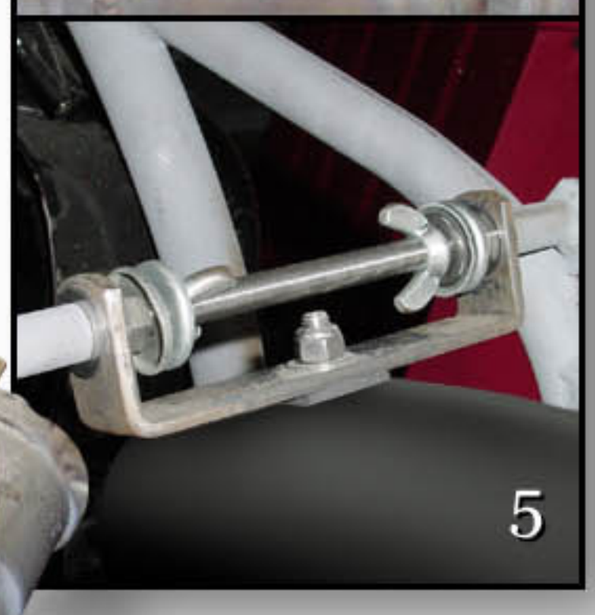
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Building a Featherlastic

Part VIII

After getting over an urge to do a flame job (too much TV I reckon), I've decided to go with a blended scheme - a deep red that turns into black from top to bottom. I wanted the graphics to be different from the common thick black stripe with thin red pinstriping over silver (though I like that look). Yet I want the bike to have a classic look.

I began the process of digitally painting the key components of the bike by taking photos of the work in progress. This included taping a cool old "Unapproachable" decal, loaned to me by Phil Dansby, to the unpainted seat hump. Once I was happy with the Photoshop mockups I met with my painter, Jason Small, who then produced painted samples of two different red-to-black blends on a spare tank.

After the painting of the tank and hump blend, I cut out the Norton logo in a special "frisket" material and had Jason spray on the two part black. I was not happy with the decals available and decided that all graphics on the f'lastic would require hand painting. The intricacy of the "Featherlastic" script I had designed was far beyond my comfort zone with a brush not to mention the pin-striping itself, which I wanted to keep thin.

This is where Alton Gillespie comes in and the work he produces is pretty incredible. I provided him with the tank, hump and fenders, color sanded and ready to go, along with color prints of the tank and hump mockups shown here. I also created actual size clear transparencies of the Norton logo with "Featherlastic" script and taped them into position on each side of the tank. Alton outlined the black Norton logos in gold and then meticulously brushed in the "Featherlastic" script. Maybe most amazing is his reproduction of the "Unapproachable Norton" decal on the hump, complete with tiny "reg. trademark" type. The beauty of Jason's prepping and paint blending, and Alton's handiwork was revealed with the final two part clear coats.

Airbrush mockup of tank over actual photo of the bike was done in Adobe Photoshop as was the seat hump at top right

Building a Featherlastic

Part IX

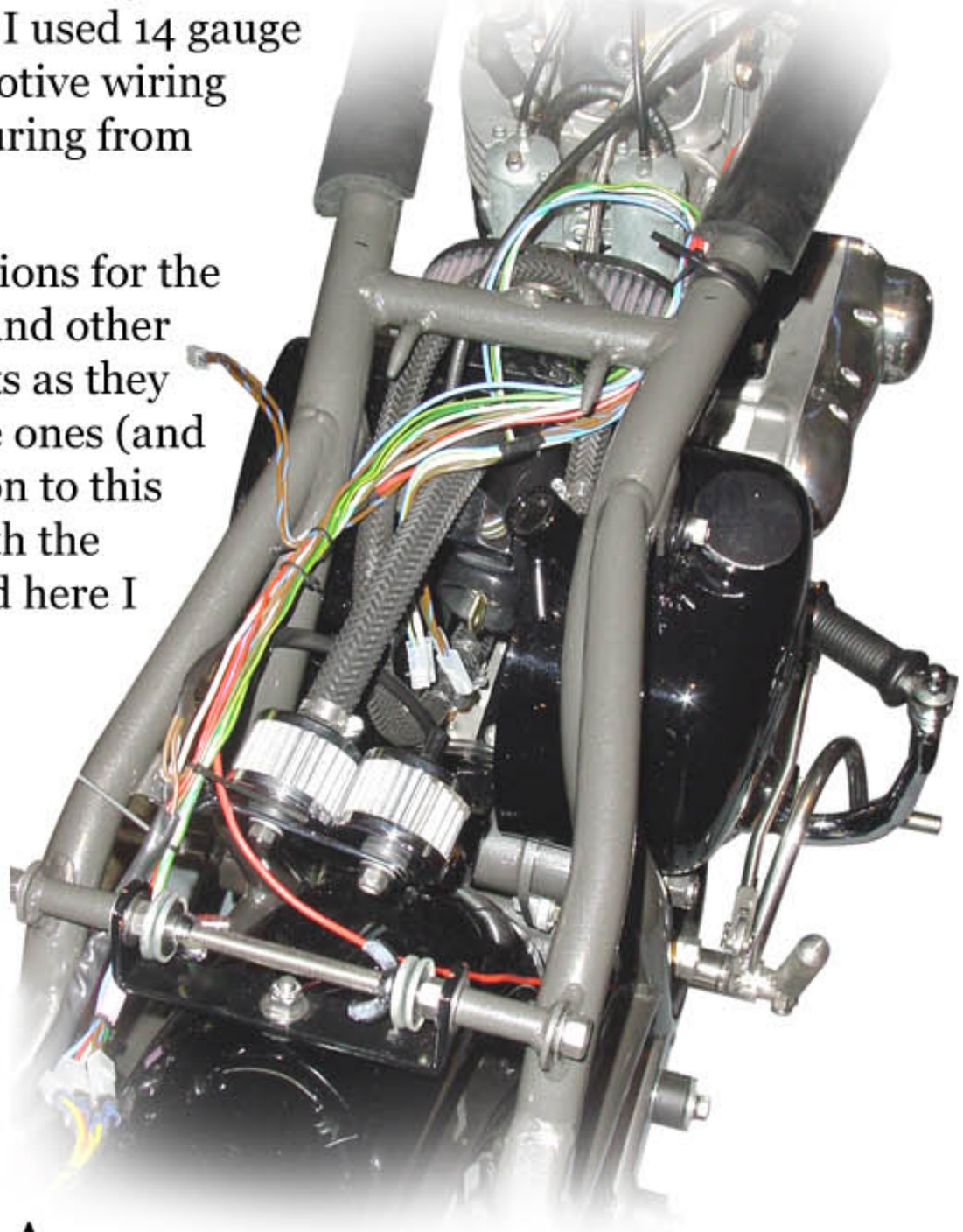
Finally getting to the point of wiring this 4 year project is pretty exciting for me. Since it is essentially a Commando in a '67 Atlas frame, I started out with a new Commando wiring harness. First I unraveled the harness tape and wrapped small nylon ties as needed to keep wire groupings together. Since I'm not installing turn signals (and there's lots of unused wires that come in these Commando looms), I then weeded out the unnecessary wiring. Next I laid the bare harness into the frame and lengthened and shortened wires as needed. I also added wiring for the ammeter in the headlight shell which runs in-line with the hot wire from the battery (positive ground of course). For this I used 14 gauge and everywhere else 16 gauge automotive wiring as it is multi-stranded to resist fracturing from vibration.

Brass British bullets (Norvil) and crimping tool (NAPA)

Boyer EI in bracket

After researching connector options for the wiring harness to the headlight and other items, I decided on British bullets as they are more robust than the Yankee ones (and politically correct). The exception to this is where the harness joins up with the Podtronic's voltage regulator and here I soldered in tab connectors.

I avoided the temptation to use the frame for grounding and instead ran ground wires to items like the head light and tail light. After I've put a few miles on the bike and know that everything is working properly, I'll wrap the harness with "Rescue" tape - a silicone tape that fuses into itself to form a solid waterproof seal.



Podtronics under the "hump"

At places where the wiring has the potential to rub (like the rear fender, rear brake light switch, etc.) I used rubber sheathing and/or grommets. For the headlight wiring, I modified a new Commando headlight harness which mated perfectly with the British bullets.

Next, I fire it up and take it for a test ride!/BC

Featherlastic Specifications, Modifications and Suppliers

- **1967 Atlas Slimline Featherbed Frame** - AMR modified for isolastic mounts, Commando side stand and Triumph centerstand; additional modifications and welding by Brink Racecraft, Irving
- **1971/72 Norton 750 Combat Engine:**
  - Combat Head ported and flowed by Norvil
  - Lightened Rockers (Norvil)
  - Titanium Push Rods/Keepers/Valve Spring Collars
  - Stock 750 Crankshaft, balanced by AMR
  - Stock Hepolite 750 Pistons (standard bore) and Rods, polished
  - RMA Auto Timing Chain Tensioner
  - Modified Crankcase Breather (850 style plus Combat)
  - Modified Crankcase Oil Pickup in sump - Norvil
  - Nortec Anti-Wet Sump Conversion in Timing Cover - AMR
  - Norvil Tach Drive Seal Conversion (Honda seal)
- **1971/72 Commando Primary**
  - Norvil Belt Drive Conversion
- **1971/72 Norton AMC Transmission (4 speed):**
  - Superblend Layshaft Bearing
  - Kickstart and Gearshift "O" ring to garter seal conversion
- **Final Drive** - Commando Rear Hub w/ "O" Ring Chain conversion by RPM
- **Custom Head-steady and Rear Isolastics** - AMR
- **Custom Engine/Tranny Mounting Plates** - AMR, anodized in Irving
- **Custom Swingarm** w/tapered roller bearings - Mick Hemmings, UK
- **Petrol Tank** 1963 (appx.) Manxman, ebay
- **Oil Tank/Battery Box:** Original Atlas, sourced from individual in England (NOC)
  - Oil Tank modified for clutch cable cutaway, Brink Racecraft
  - Battery box modified for full-size battery
  - Custom mounting pedestal/frame brackets (to isolate from engine)
  - Norvil oil filter kit (Commando)
- **Exhaust System:**
  - Sweptback Pipes, Clubman Racing (modified)
  - Short Megas, Clubman Racing
  - Custom SS Muffler Brackets - AST Waterjet, Irving
- **Front End:**
  - Atlas/Early Commando Bottom Triple Tree
  - Norvil alloy Top Triple Tree and fittings
  - Norvil tapered Steering Head Bearings
  - '71/72 Commando Sliders, modified internally & externally
  - Commando TLS Front Brake Hub w/stiffener conversion by Vintage Brakes
  - Manx-style exposed Springs/Retainer Cups - Clubman Racing
  - Manx-style alloy "Y" brackets - Unity Equipe, UK
  - Manx-style alloy Front Fender - Unity Equipe
  - Morad (Akront molds) WM3 19" Alloy Rim, SS spokes - Central Wheel, UK
  - Commando Clock Holders
  - Speedo and Tach, Smith - rebuilt by Nissonger, NY
  - Headlight mounts - ebay (made in Canada)

Specs, cont'd...

- **Rear Wheel:**
  - Norton Commando Hub
  - Norton Commando Brake Plate, modified for Atlas swingarm, etc.
  - Morad WM4 18" Alloy Rim, SS spokes - Central Wheel; lacing by Steve, RPM
  - "Made in England" Rear steel fender (RPM shelf item)
- **Seat/Hump:**
  - Seat Pan (Unity Equipe), cut and modified for slimline frame
  - Leather Upholstery - Bobby Ellis, Custom Auto Design
- **Lighting:**
  - Atlas Front Headlight Shell with Norvil Halogen Conversion
  - Beck/Arnley 60's Rear Tail Light Housing, ebay w/NOS Lucas Lens
- **Electrical System:**
  - Dynatek DC7-1 Twin Fire Coil
  - Boyer Brandsen Micro Digital Electronic Ignition
  - 180 Watt 3 Phase Alternator - Norvil
  - Podtronics 3 Phase Voltage Regulator
- **Cables:** Stock Commando except for custom throttle and front brake by RPM
- **Clip Ons:** Tomaselli Adjustables - Unity Equipe
- **Rear Sets** in stainless by Norvil
- **New Chrome and Re-Chroming** by Al's Associates, Fort Worth
- **Powder Coating** by Custom Powder Coating, Irving
- **Body Work and Paint** by Jason Small, Texas Specialty Rebuilds
- **Pinstriping and Graphics** by Alton Gillespie

Special Thanks to...

Jason Small, Texas Specialty Rebuilds
Mike Brink, Brink Racecraft
Steve Martz, Custom Powder Coating
Keith Martin, RPM Motorcycles
Steve Adkins, RPM Motorcycles
Mike Harcourt, AMR Motorcycles
Les Emery, Norvil
Kate Emery, Norvil
Randy Ullery
Phil Dansby
My wife, Sandy (for tolerating me and my Nortons)