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**FEATURE**

Story by Norm Larch, photos by Andrew Holliday

# FAMILY REUNION

*SWAPPING the 2.0CR TDI into the JEEP WRANGLER*



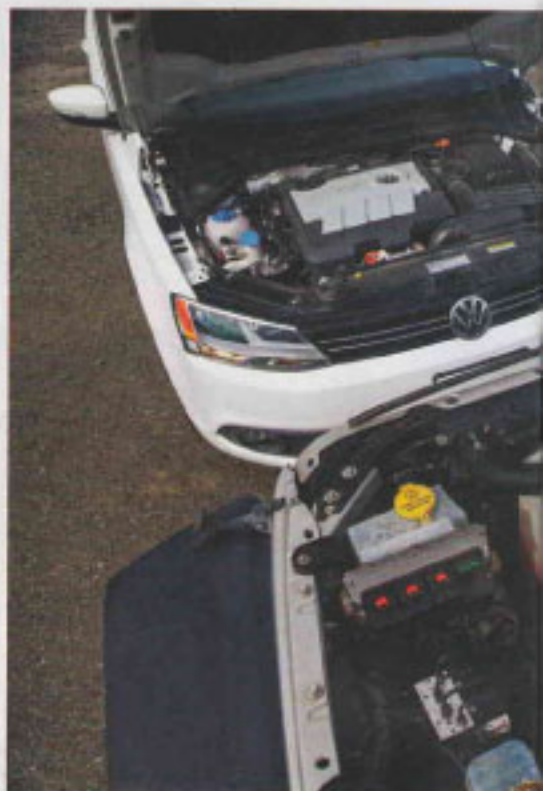
**A**ny Jeep enthusiast that has driven in a TDI Jetta has likely had the same daydream. What would the Wrangler be like with the eco-friendly, torque-happy TDI powerplant pushing it? Potential fuel savings alone would make even a skeptic take notice. The 2014 Jetta reports under 6L/100km fuel consumption on the highway in real world conditions versus claims ranging from 13-15L/100km on the current Pentastar equipped Wrangler. The quiet refined torque delivery of Volkswagens 2.0CR TDI would certainly charm onlookers on any trail.

Is such a marriage too much to ask? Well truth be told, there is strong history between the JEEP and Volkswagen that many enthusiasts may not even be aware of. Both AMC and Chrysler have had engine supply agreements with Volkswagen outfitting JEEP models with ultra-efficient compact 2.0 engines dating

all the way back to 1979.

As a youth, I can remember the local mail service coming down the street in their little Jeeps. Not knowing much about Jeep at the time, I was simply taken by the utilitarian look and feel of that delivery vehicle and the bold letters spelling out JEEP on the rear gate that left a lasting impression in my mind. Imagine that, branding back before Google and the web reaching young kids!

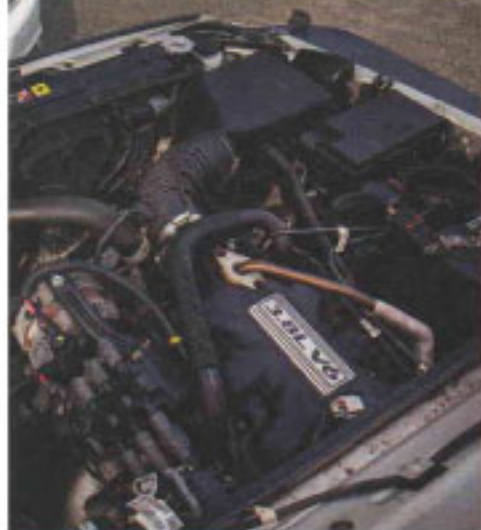
In 1979, AMC struck a closed-door deal with Volkswagen to purchase their 2.0L inline four-cylinder. At the time, there was to be no reference to Volkswagen, or Audi and Porsche who all used this same engine. The major castings were purchased by AMC and assembled in the Indiana plant and later installed in a number of passenger cars but most notably in the 1979 Jeep DJ-5G. The result - a 2WD mail delivery Jeep. This 95 hp engine was mated with a Chrysler



Many Jeep enthusiasts have been crying out for a diesel option for the Wrangler, it likely just won't come until 2016.



There is a long-standing history between Chrysler and VW, even if it doesn't quite show.

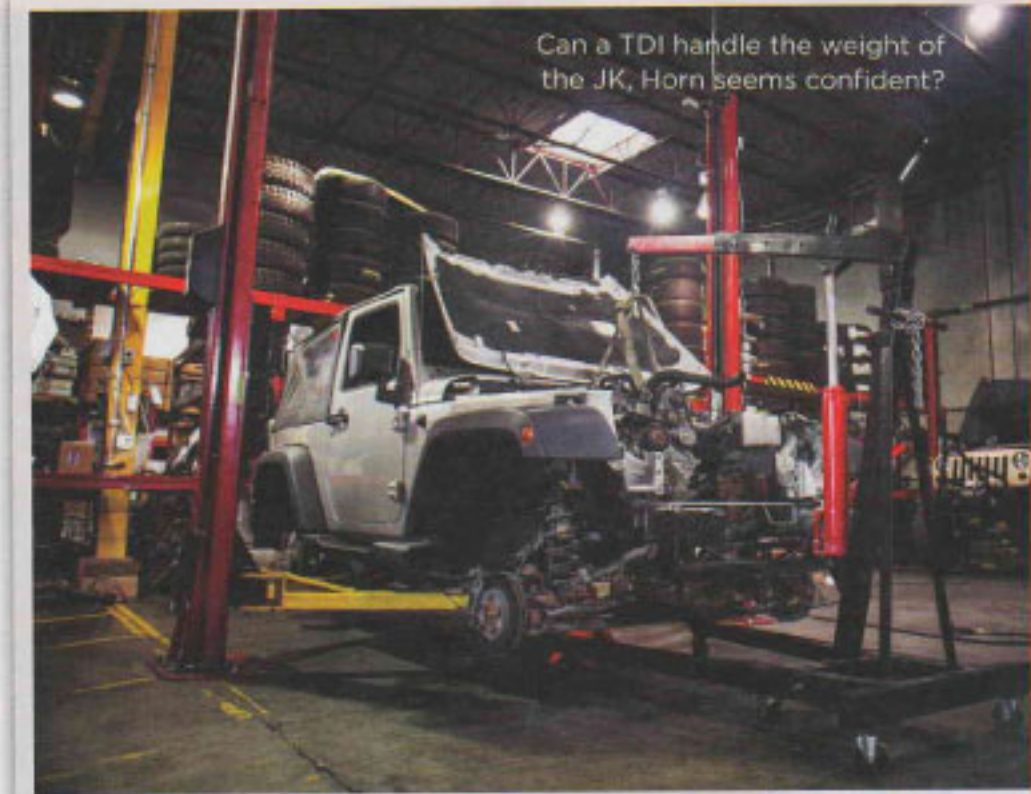


Torqueflite 904 automatic transmission.

Fast forward to 2005 when Chrysler and Volkswagen assembled a five year supply agreement for the 2.0 CR TDI and you might be surprised to learn that the 2007 through 2011 Jeep Patriot and Compass were outfitted with this 140 hp turbo charged diesel engine. The 2.0 TDI Patriot won the 2007 Green 4x4 Award and the 2008 4x4 of the Year in the UK.

So why not in the Wrangler? Some may lean back and say that the 2.0 TDI is too small for the heavy Jeep. When you look into the Volkswagen line up, and expand your vision overseas, you find that the 2012-2014 all wheel drive Passat wagon uses the same 2.0 CR TDI as the North American Jetta, its numbers are slightly bumped to 170hp from 140hp. When you compare the curb weight of this little wagon vs. a SWB Wrangler you will find that the Volkswagen is nearly as heavy coming in at 1,725 kg (3,803 lb) compared with the Wrangler's 1,752 kg (3,864 lb), so capable of managing the weight is no concern.

Like any family, relationships within come and go; the depth and complexity grows. This supply agreement between Chrysler and Volkswagen was a good fit,



and might have led to a factory produced TDI powered Wrangler, that is until Fiat entered the mix. Owning their own small diesel engine production in Europe (VM Motori S.p.A), outfitting future Jeep's with these proven clean and capable Volkswagen TDI's seems unlikely.

In Europe, Fiat-Chrysler group actually fit their 2.8L DOHC 16-valve 4-cylinder Common-Rail Diesel (CRD) engine that pumps out 200 hp of power and 340 ft-lb into the 2011 Wrangler achieving reported consumption of 8.0L/100km

Sadly, neither the VW TDI powered Patriots, or Fiat Diesel Wranglers have made it to our shores.

In steps Coty Built, based out of Langley, BC. We first learned of this team back in 2010 when they debut a concept Jeep YJ with Volkswagen's TDI installed at the SEMA show. We have followed this group over the past few years and recently caught up with them as they prepared this year's SEMA entry.

"Much has changed since the initial build in 2010," states Marcel Horn, owner of HPA Motorsports, the 25-year-old parent company of Coty Built. "The original TDI conversion was a design

exercise. We needed to answer a few questions. Would it fit, how would it perform, what would the mileage be? Coty Built has attended the Easter Jeep Safari in Moab, UT, for the past two years shaking down their TDI concept Jeeps. With mileage numbers ranging between 8.4-7.1L/100kms (28-33 mpg) and enough low-end torque to climb any trail in Moab, the package has proven viable.

Today's iteration retains all the factory Jeep engine accessories for YJ/TJ and just recently the XJ. Basically, everything in front of Volkswagen's long block is Jeep in origin and everything at the back of the long block is Jeep. This keeps field service straightforward.

The original Jeep TDI YJ and all TJ and XJ applications of this conversion are centered around Volkswagens 1.9PD (Pump Duse) TDI. An engine found in late 2003 through 2006 North American Volkswagen production. With a modified ECU calibration, Coty Built's ultra efficient liquid cooled aftercooler, this little package is delivering an impressive 150HP and 260ft-lb. "There is more head room," states Horn. "You can swap in larger injectors and opt for a larger turbo, but the Jeeps found onsite offer already 70ft-lb more



Stay tuned as we will follow this build step by step.



then the 2011 3.8 V-6 Rubicon Unlimited on the dyno and deliver incredible mileage.

Since 2011, the team at Coty Built has ironed out a lot of hurdles for the enthusiast looking to perform this update. A dual CAN box converts the Volkswagen engine signals into Jeep's native language to retain full functionality of the Jeep instrument cluster. Preformed silicon boost plumbing offer up a near OEM look under the hood, and newly cast transmission adapters support every manual gearbox in the Jeep line up, AW4 automatics are in the works according to Horn.

When you sit and listen to the design elements of the TDI, you find yourself getting even more excited about this swap. Designed in a 1G environment, oiling of the engine on inclines or declines is not a concern. Unlike some domestic four-cylinder diesel engines, the 1.9PD weighs 23 kg (50 lb) less than Chrysler's sluggish 2.5L four-cylinder (a 500 lb win over the domestic brands diesel).

In 1979, the Jeep shared the same 2.0L four-cylinder as the Porsche 924. Today, much like a Porsche, the Jeep never dies; it simply finds a new owner. This is what makes the very idea of swapping in a TDI interesting. TJs for example hold great value; just try to find a cheap LJ! Investing into a smart, clean diesel powerplant will not only raise the value of the Jeep you



are building, but will set it apart for off highway performance for decades to come. Rumours are that 2016 might deliver a factory diesel Wrangler to showrooms, but this does little to support the 30+ years of Jeep enthusiasts looking to shed the inline 4.0L and not trend to a larger gas powerplant such as the LS1 or Hemi.

We have been invited in to witness the build up of Coty's next development Jeep. As the team ventures into the JK platform, they will draw the line for the 1.9PD in favour of the 2.0CR TDI. With Volkswagen and Audi combined placing more than a 100,000 TDI powered vehicles onto North American streets every year, this will be the perfect donor engine to support today's platform. Having a recent history under the Jeep moniker with the patriot and Compass, the fit feels right.

Coty Built found a pristine one owner 2007 JK X for this year's SEMA build. Outfitted with the NSG370 6-speed manual, it is right in their wheelhouse. The engine comes from a willing donor, a 2012 TDI Jetta that sustained a front end hit just above its bumper.

Housed within HPA's 12,000 sq-ft headquarters, the Coty Built build team enjoy access to an in-house AWD SuperFlow chassis Dyno. It will be here that the final calibrations will be tweaked with sights set for 220 hp and 400 ft-lbs. Clearly a far stretch from the current 3.8L V-6's reported 205 hp and 240 ft-lb.

Coty's conversion system allows the Jeep to retain its factory flywheel and clutch, keeping the gearbox in its original locations. This is great for sourcing replacement parts and keeps you from being handicapped when upgrading other segments of the Jeep with known and proven aftermarket bits. At the front side, the Jeep alternators, AC and power steering are all retained, again keeping life as simple as possible for attending to service items down the road.

Speaking with Horn, it is apparent that building a TDI powered Jeep today is much more than just swapping in an engine. He and his team look to place these converted Jeeps into the toughest environments where the Wranglers are asked to play on a daily basis. To do so, gearing, body, and lighting all need to be considered. "The JK is a whole new learning curve for our team," says Horn. "A new body, electronics and system integration all must be considered. The key will be to ensure that our swap does not interfere with any existing aftermarket upgrade for the JK. We don't want to build Frankenstein's, rather inspire the enthusiasts to take an upgrade path with their Wranglers that the factory could not with all their family baggage."

The 2.0CR TDI is much larger in presence than the 1.9PD TDI that the Coty team has been packaging in the YJ/TJ and XJ platforms. With a belt driven fuel pump, intake on the opposite side of the turbo, it has the girth of a Hemi at a glance. For this reason, it will not be placed into the earlier smaller platforms, but should find its way nicely into the JK.

Coty has developed a second iteration to its original truss member found on the 1.9TDI swaps. This Aluminum plate houses all the Jeep engine accessories without interfering with the belt driven fuel pump. Under the hood, any seasoned Jeep technician should be able to find his or her way around. Watching this power train be extracted was exciting. The plan for this 2.0TDI conversion will see no welding as the Coty team has designed for a direct bolt in. This should be even more inviting for builders as it simplifies the steps required.

Horn hopes that the new 2.0CR TDI swap hardware package will also slide in under \$10,000, including engine as it does with the 1.9PD TDI for YJ/TJ/XJ. This means that if you could manage the labour yourself, you could have a diesel powered Wrangler in your garage for less than the cost of a Honda Civic as the Wranglers are becoming more affordable each year.

Follow along in our next issue as we continue with this conversion and look into some exciting trail gear to prepare this rig for SEMA and its first trail testing at the 2015 Easter Safari in Moab.

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