break. We ended the whole process with ChemHelp's Chris Real conducting an SAE J1287 sound test. Real's no-nonsense scientific approach leaves scant room for any kind of error or questioning. The noise issue is critical, and we can't ask you to run quiet systems on your machines if we don't do the same here. Since the primary purpose of the Raptor is usage on trails, we told the companies that all of the exhausts must be under 96 decibels and equipped with a spark arrestor. That number is the law here in California and is likely to be the rule where you live in the near future. Some states have even lower sound tolerance, and the dunes in Oregon require a sub-93-decibel level. Sadly, we had three systems go over the limit, with two just barely missing the mark and one making a major infraction.
Piping Hot
Searching for bolt-on power for the '06 Raptor 700R

By Bryan Nylander  Photos by Adam Campbell, Bryan Nylander and Mark Rolland
By our third date with Yamaha's reincarnated 700R, we couldn't wait to discover more horsepower in the new Raptor via a bolt-on or plug-in product. Just the thought of how the motor would respond with an aftermarket exhaust system attached caused us to eagerly jump into the whirlpool of testing to find out. Since this was our (and most of the pipe companies') first foray into the world of Electronic Fuel Injection, we were really curious to see how much of an advantage new metal could provide or if simply messing with the electronics would be the trick.

The process was educational for all involved, and the learning will no doubt continue as EFI becomes more common on sport quads. Replacing the fixed-ratio carburetor with a digitally controlled air and fuel mixer has made life simpler and more complex at the same time—just as with all the other technological innovations we continue to implement into our daily routines.

The Raptor's Yamaha Fuel Injection (YFI) controller does an amazing job of keeping the air-to-fuel mix accurate regardless of altitude, throttle position or what exhaust is mounted. However, in the quest for more ponies, a problem is born: The rider may demand a stronger mix than the factory-set curve provides.

DynoJet, Techfusion/Dobeck (CT and HMF) and White Brothers have already jumped on the wagon and created little black boxes that plug into the throttle body wiring to allow different fuel-air mixtures to be supplied to the engine along with different performance parameters. This is the more complex part of new technology—the seemingly endless variations to fiddle with instead of the fixed jet tolerances. We left the EFI controller tweaking to the pipe companies and simply plugged in what they gave us so we wouldn't end up with a performance that didn't match their ideal—after all, that is part of the reason you are paying the big bucks for the hardware or software. But with a manual and some time on your hands, you could certainly try a host of variations—much like trying different settings on your shocks after you get the suspension back from the shop.

After a week of mounting and yanking off hot pipes (which gives an all-new meaning for "piping hot"), dismantling the 700R to deal with the TFI units and earning a few burned digits, hands and forearms (to justify the occasional burst of swearing) in the process, our poor machine was almost as tired-looking as we felt. Our testing took us to K&N to use its dynamometer to get the horsepower output with each unit, and then it was off to a couple of tracks to uncover the riding performance characteristics of each system in the dirt. Why a motocross track instead of a trail if this isn't an MX ATV? A track means a controlled environment where we could run each system over the exact same terrain in a close-by setting to see how it all worked for quick troubleshooting should anything break. We ended the whole process with ChemHelp's Chris Real conducting an SAE J1287 sound test. Real's no-nonsense scientific approach leaves scant room for any kind of error or questioning. The noise issue is critical, and we can't risk it to run quiet systems on your machines if we don't do the same here. Since the primary purpose of the Raptor is usage on trails, we told the companies that all of the exhausts must be under 96 decibels and equipped with a spark arrester. That number is the law here in California and is likely to be the rule where you live in the near future. Some states have even lower sound tolerance, and the dunes in Oregon require a sub-93-decibel level. Sadly, we had three systems go over the limit, with two just barely missing the mark and one making a major infraction.

Enough background info, on to the experiment. After our baseline runs, with and without the airbox lid, we installed a high-flow K&N air filter. Our first surprise of this entire escapade was the single horsepower gained by simply removing the airbox lid and further compounded by the high-flow kit's three-pony increase. Since it couldn't hurt any of the exhausts, we left the K&N in place for all of the systems. We also sampled Pro-Tec's MoFlow Airbox Lid, which functions as a prefilter and keeps the occasional splash off the filter—good for a paper filter such as the K&N. The MoFlow didn't alter the power, and it's a good option versus running a bare filter.

For each system we produced a dyno chart, a brief description of the test rider's impressions along with the actual sound level emitted by each. As you will no doubt notice, adding a pipe gives the new Yami a boost but nowhere near what it did for the old 660R. In fact, it was a hair-splitting job to separate the wheat from the chaff with all of these systems falling within a two horsepower and torque range. The jury is still out on whether the new engine is simply that good; the YFI keeps a tight rein on things even with aftermarket electronics in the mix. Using the same technology in a different wrapper could also be the culprit.

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**Stock**

- **Quad Works: Power Kit, $134.95**
  - 89.1 dBA with airbox lid
  - 89.5 dBA without airbox lid

- Quad Works' System, $290.50;
  - www.quadworks.net

With airbox lid removed and Quad Works' Power Kit (uses a high-flow K&N air filter) installed, the 700R has a good output. Its power builds linearly to a healthy midrange, but it lacks snap or anything else on the bottom. Grade: C+

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Yamaha
GYTR-R: $379.95
93.1 dBa
Yamaha: www.yamaha-motor.com
Not surprisingly, Yamaha has a cure for its Raptor's lackluster low-end performance, and its remedy delivers an immediately perceptible gain all around, with more power on bottom.
Grade: B

Pro Circuit
Type 496 silencer: $424.95
96.7 dBa
Pro Circuit: 951/738-8050;
www.procircuit.com
This slip-on was a good solution to the low-end deficiency but barked just a bit too loudly for legal off-road use. A bummer since the PC unit gave a healthy power increase in the bottom to mid region before flattening out on top.
Grade: D+, failed sound!

White Brothers
E2 slip-on: $399.99 (with competition end-cap and spark arrester);
Hotbox (TFB): $209.95
95.7 dBa
White Brothers: 714/692-3404;
www.whitebrothers.com
A definite improvement over stock, the E2 bumped the power probably 10–20 percent—enough to allow the engine to pull nicely up hills. Connecting the Hotbox added more juice where the slip-on's improvements ended—on top.
Grade: B
CT Racing
Sonic Full system, $508.95; Dobbeck/Thermal Fuel Management System, $499.95; CT Racing: 562/945-2453; www.ctracing.com
Best all-around power. Every gear felt strong, never bogged through Talladega corner and had nice power even when short-shifting. If it were at least one decibel lower, we'd recommend this for closed-course competition. With the TPI installed, it pulled the hardest of all. The pipes from bottom to top and was able to run a taller gear up big hills.
Grade: D, failed sound!

DMC
Afterburner Quiet4 full system: $539.95; 95.6 dBA; DMC: 951/300-2250; www.dmc.on-line.com
This would be a good system in locales where smooth is a riding technique. It produced a mellow all-around power that was better than stock, but it did bog a little when short-shifting. The can is directly under the whip mount so the dune folks might have issues with it. The can is lightweight so its single mount may not be a problem.
Grade: B-

Dubach Racing
Dr. D slip-on, $255.95; quiet tip insert, $39.95; header, $249.95; (total: $585.85)
95.4 dBA without airbox lid; 95.7 dBA with Dr. D-modified airbox lid (higher sound level due to increased engine temp)

Dubach Racing Development: 951/880-1114; www.dubachracing.com
Dubach's system bumped up the power and spread it out over a broader powerband through the gears and capped it off with more pull in the top-end.
Grade: A
FMF
Q2 silencer: $359.99; PowerBomb header, $239.99
95.6 dBA
FMF: 310631-4363; www.fmfracing.com
A good off-road pipe, the FMF was snappy off the bottom, and it felt good while short-shifting; in fact, this pipe works best at low rpm. So it wasn’t a shock that it fell flat on top in the second to third gear arena.
Grade: B+

HMF
Quiet Race System (QRS) brushed-aluminum full system, $450;
Dobrev/Techniflask TFI Box, $199.95
95.3 dBA
HMF Performance: 866/HMF-PIPE;
www.hmfflangeengineering.com
The tester notes read like a fine wine description. However, the HMF setup did serve up good results with a crisp low and midrange and a nice throttle response throughout the powerband. With more tinkering on the TFI, this system could likely be even stronger.
Grade: A-

Hindle
Titanium Stealth Off-road full system:
$432.30
93.3 dBA
Hindle Products, Ltd.: 905/985-6111;
www.hindle.com
Our first impression of the Hindle system was that there were so many springs to deal with. However, it turned out to be a relatively easy unit to mount and remove. It also was perhaps the best under 96-dBA system, with a very good bottom and midrange delivery, pulling so hard going up a big hill that it was a struggle to keep the front end down.
Grade: A
White Brothers
Aluminum Pro full system, $595.95; Hotbox, $209.95
97.6 dBA
White Brothers: 714/692-3404; www.whitebrothers.com
We really liked this system, especially when paired with the Hotbox unit. However, two decibels too many sank it for trail riding. If we were taking the 700R to a GNCC or WORCS race (read: closed course), this would be the system we’d choose. Its good all-around power meant it pulled nicely though the gears, handled short-shifting without a bog and had the best throttle response of all the units. Surprisingly, without the electronics, the engine revved higher in second to third gear but otherwise was the same as with it.
Grade: D, failed sound!

Yoshimura
RS7 Pro Series quiet full system: $575
93.1 dBA
Yoshimura: 800/634-9166; www.yoshimura-rd.com
The Yosh system is proof that dyno numbers are not everything. Despite cranking out the top horsepower number, its on-track performance didn’t impress our testers. They noted a little more power in the midrange, but it wasn’t a big boost. Overall, it had a lackluster response that simply felt flat compared to the rest.
Grade: C