Sound Testing The Big Four Strokers – Feature Review – Dirt Rider Magazine

By editorial staff
Tuesday, February 24, 2009

In the very near future, noise will be an enforced competition rule, period. This is what the experts tell us. Some people argue that a "closed course" machine should not be subject to strict noise limitations. However, noise regulations for competition have been on the books for a long time. The popularity of big bore four strokes has brought the issue of noise up to the forefront of land use discussions, even on private property. Another reason for considering noise is because the noise that a machine makes can give away your position on the course and can make serious impressions on neighbors and voters. The fact that noise in our sport could drastically limit where and when we can ride, should cause us all concern. Since sound is a major issue these days on big bore 4 stroke motocross bikes, the shootout would not be complete without an accurate sound test. Dirt Rider set out to contact the foremost expert in accurate sound testing and safety awareness to help us with this test. That man is Chris Real. Chris is a certified lubrication technician and sound test technician. He and his company Chemhelp, are active with government officials in regard to keeping our environment and recreational land open and functioning on a variety of topics. While doing all this, Chris is working with the developer of the SAE J1287 Test Procedure in an outreach program to educate the land use agencies so they know how to do a proper sound check. For this test in our shootout, Chris will be using an ANSI Type II Decibel meter, which is typical of tech inspectors, to test our three big four strokes in the 250 class shootout. To begin his test, Chris sets up his bike holder, measuring template, and sound decibel meters. Chris uses the standard SAE J1287 test method, which is the 26 inch rule that the California Parks and Recreation officials use to measure offroad motorcycles. Chris uses two tachometers, two decibel meters, and will run 4 tests set up using a tripod to hold the meters. That gives him 8 readings for his baseline results. Then, he hand-holds the meters, as required by the standardized test methodology, for the final regulation readings. The test requires that the meter be held in a position that is 45 degrees off the direction of the exhaust outlet, back and away. The meter sensor must be at 90 degrees to that, pointing to the back, and the motor must be 20 inches away from the tail pipe with a wind sock over the sensor. All these criteria are specified in the SAE Test Procedure, which is an ANSI internationally recognized test procedure, implemented in 1973. It’s also outlined in depth in the Motorcycle Industry Council Book. These angles are crucial for several reasons. First, in the instance of the KTMs, the silencer ends with a slight angle, aiming to the outside of the bike. If proper angles were not measured carefully, the exhaust on a KTMs would be pointing more at the meter sensor than on the other bikes. Secondly, the 90 degrees angle of the sensor is necessary to avoid "wind" pops from the air flow out the back of the bike. A seemingly small puff of air can send the reading into outer-space. Also, there must be no objects within 6 feet of the test bike, and the tester. With his equipment all set up, Chris now starts the bike. He allows it to warm up for 2 minutes, and not longer. Proper operating temperature is necessary, but he doesn’t want the bike to overheat in its static mount. A hot motor would result in testing error on the loud side of approximately half a point. Chris then watches his two wire type tachometers carefully to obtain the correct RPM. He uses a vibrating wire type tach, because it is much more accurate than electronic tachometers. Motorcycles like these don’t have a pure pulse at the spark plug like a car would. There is an extended burn in instead of a pulse. The RPM specified by the Motorcycle Industry Council manual is a calculation of the stroke of the engine, resulting in half of the engine’s red line. The reading from his field notes are carefully logged into his data base where he creates a weighted average, and then a final number. This number is the sound decibel level Chris offers us some tips, not only on the subtleties of how he admisters the test, but also ways that to help our bike run at peak performance and minimal sound output. First of all, as we said earlier, a warm engine is best, but not a hot one. Second, the bike should be running in the best tune possible. In other words, timing, spark, and fuel air mixture should all be in optimum tune, as in any high performance engine. For the best sound reading, the motor could be running a little bit rich to keep it from sputtering. Thirdly, and most obviously, the silencer packing should be serviced properly. Follow your manufacturers specs as to the recommended hours of ride time for the life expectancy of your silencer packing. Properly maintained silencer packing will be quieter, cooler, and also give the most power, this has all been proven on dyno horsepower graphs. The results of the test by Chris Real using an ANSI Type II Decibel meter, which is typical of tech inspectors, are as follows: Honda 2004 CRF450, 95.75 decibels Yamaha 2004 YZ450F, 97.70 decibels KTM 2004 SX 450, 96.50 decibels

Starting in the later part of this year, 2003, DPS Chemhelp will have a Tech Inspector Certification Class on environmental protection, and noise abatement. About a third of the class content will be on general environmental awareness and mitigation relating to fuels, oils and chemicals. The other two thirds of the class will be on a National Schedule, and have various sponsors to be announced. The class will cost less than a hundred dollars, and will have various co-sponsors that could really bring the price down. We do know already that the Honda Riders Club has offered some membership fees will be at various events throughout the year doing complimentary sound checks. Chris will also offer clinics on how to repack and service silencers. Many thanks from Dirt Rider Chris Real for his help in this sound testing and education. For more info on Chris Real, his sound technology, and other environmental issues, visit him at www.chemhelp.com.