**Product Comparison**

### Can You Hear Me Now?

**Aftermarket Horns Compared**

by Mark Barnes, Ph.D.

**Motorcycle horns are notoriously wimpy.** With few exceptions, they’re barely louder than a kazoo, and command about as much respect in traffic. Fortunately, there’s a wide array of aftermarket options available, and, for the most part, they’re neither expensive nor terribly difficult to install. We’ve gathered representatives from popular brands for comparison, but first let’s cover some general considerations.

There are two main categories: Air horns and vibrating electromagnetic horns (the OEM type). Air horns have the following reputation: They’re louder than electromagnetic alternatives and sound more like a truck horn, delivering the maximum intimidation factor. It can also take a moment for air pressure to build up enough to drive the horn, possibly making the alarm a split-second too late, no matter how much attention it commands. Also, because of their startling volume, drivers may be confused about where the sound is coming from (looking frantically for something huge bearing down on them), so air horns can cause drivers to take impulsive and unpredictable “evasive” action that might actually increase the danger to a honking motorcyclist. Wanna guess how much of this mythology we believe after doing our testing?

But, what’s certainly true is that they also tend to be larger, heavier and harder to mount, as their housings must accommodate an air compressor. And that compressor’s motor requires a lot of electrical energy, which necessitates the use of a relay to provide sufficient power and prevent damage to stock switches and wiring. Also, their power draw may challenge some motorcycle electrical systems (true to a lesser extent with dual electromagnetic horns).

Horns that use an electromagnet to vibrate a diaphragm, and therefore generate sound waves, take effect instantaneously, and (single units) usually don’t use much more power than the 1-2 amps required by an OEM horn. They also tend to be smaller and lighter than air horns. But are they really loud enough to deliver a substantial advantage over a stock horn? And how much louder are their compressor-driven cousins? Read on...

You’ll notice that some aftermarket horns look like the common round OEM units, while others employ a nautilus shell-like trumpet to amplify and direct their sound. Also, some make a single tone, while others create a high- and low-pitched tone, either by pairing two separate horn units in a set, or by generating two tones within a single unit (only the air horns accomplish this trick). The discordant sounds produced by dual-tone horns have an additional layer of obnoxiousness that adds to their attention-getting power beyond sheer volume.

We measured the actual sound pressure output in decibels (dB) for each of our contestants, as well as several stock horns, using a professional-grade digital sound level meter at distances of 10’ (noted) and 30’. Those distances were chosen to represent two different situations. The first, a car drifting into a motorcycle’s lane when the two are traveling in the same direction. The second, a car turning left into a motorcycle’s path at an intersection. We wanted to see if there was any appreciable difference in how well the sound produced by each design carried, and how they varied from manufacturer claims. We took these measurements from straight ahead of the horn, and at a 45° angle to one side.

Note that the decibel scale is logarithmic, so a three dB difference equates to twice the sound pressure, and a difference of 20 dB equated to 10 times the pressure. However pressure and perceived loudness are not the same thing, and a difference of 10 dB represents a doubling of perceived loudness.

Because of their differing mounting requirements, it wasn’t possible to position them all in the same place on the same bike, so to make this comparison as fair as possible, we mounted each horn on a rigid wooden structure that had no forward or lateral obstructions, and used a fully charged, uninstalled motorcycle battery for power. All dual horns and air horns used a relay for minimal wiring resistance. Solo horns were powered sans relay using the horn leads from a bike with another fully charged battery installed (mounted on the same test structure).

We expected to find significant differences when measuring each horn’s output at all those varying distances and angles. To our surprise, all readings for any given horn were within a half-decibel of each other. For some horns, there was almost as much variation from one trial to the next with everything in the same place! So, at relatively close range, it appears to make little or no difference if a horn is pointing directly at its intended audience (although slight losses were noticeable at a 90° angle). Amazingly, in almost every case, the sound pressure levels we measured exceeded—sometimes by a large margin—the manufacturers’ claims.

Another surprise: There wasn’t much difference in the tonal qualities of our samples; it ended up being impossible to characterize them very specifically. They all sounded decidedly more automotive than the higher pitched, “tinnier” sound of the stock horns we tested for reference (which generated sound pressure levels in the 91–99 dB range). As expected, the round disc design of the Hella Supertones produced a sound quality closest to the stockers, albeit much, much louder. The spiral trumpet designs all delivered the archetypal car horn sound, while the compressor-assisted units were sonically identical, leaning toward the sound of the air horns you hear at sporting events—not quite car, not quite truck. Any of the aftermarket units would command substantially more attention than a typical OEM motorcycle horn.

When deciding which horn might be best for your motorcycle, keep its mounting foremost. However, if it must be positioned beneath bodywork, or facing down or sideways, our testing suggests that losses are likely to be negligible. You may also have to do a bit of bracket fabrication. And, if your charging system is weak or already on the verge of overload because of your other powered accessories, you’ll probably want to steer clear of the more power-hungry options on that basis alone. If your bike doesn’t have adequate juice to power the horn, it won’t be loud.

Prices and vendors shown represent the best deals we could find at the time of testing. Current draw values were estimated based on fluctuating readings gathered with a properly functioning digital multimeter, and the number reported was the peak reading from multiple trials. We’re not sure why we couldn’t get stable readings (and a local electronics expert didn’t know, either); perhaps because the electromagnetic horns actually “flicker” as they vibrate on and off very quickly during use, and the air horns’ compressors require more power to start turning than they do to keep turning once they’ve reached their full speed. Even electromagnetic horns apparently suck more juice during the first nanosecond of use; we blew a 10A fuse trying to power the pair of FIAMMs off our test bike’s stock wiring harness, even though we subsequently never got a reading higher than 8.7A for them on our multimeter while running them off the external battery.

Read on and enjoy the results of our testing.

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**Prices and Vendors**

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**Note:** The above table is a placeholder and needs to be replaced with actual data. The prices and vendors listed are based on what we could find at the time of testing and may vary.
Fiamm Twin Tone Horn Set
$24.05 // 129.5 dB

Performance: ●●●●●
Ease of Mounting: (solo) ●●●●● (dual) ●●●●●
Value: ●●●●●
OVERALL RATING: ●●●●●

Type: Electromagnetic Diaphragm with ABS nautilus shell amplifier
Claimed sound level/frequency: 125 dB/no frequencies specified
Actual sound level: 127.8 dB (low tone, solo), 128.1 dB (high tone, solo), 129.5 dB (dual horns)
Power draw: 4.6A (low tone, solo), 4.5A (high tone, solo), 8.7A (dual horns)

Weight: 7.5 oz., each
Dimensions: 4” W x 2.75” D (measured at widest and deepest points, excluding mounting post; likewise with other units)
Mounting provisions: Each horn includes a single bracket with hole centers 2.5” apart
Notes: These horns were purchased separately; 30A relay is recommended (must be purchased separately) if running both together; sturdy ABS plastic is used for the trumpets; FIAMM's Freeway Blaster model, also available in high and low tones, is claimed to be even louder at only slightly greater cost ($15.91 each at Amazon.com).

Model: O.E. Horn Replacement—$14.99 and $9.06, respectively, at Amazon.com (spend another buck to get Amazon’s free shipping on orders $25 and over); black only.

Counter-intuitive fact: Two horns aren’t much louder than one; sound pressure is not additive (although power draw is). And actually, what volume difference we found here may simply be the result of running the dual setup directly off a battery, as opposed to running individual units off of the motorcycle’s wiring harness. While a gain of over one dB is significant, it’s really the dissonance of contrasting sound frequencies that gives a two-tone combo its biggest advantage: Said dissonance really completes the aural image of a car horn and adds to the aversive impact on a listener. However, if mounting limitations preclude the use of a dual setup, just one of these horns will still easily outperform the vast majority of OEM units. We’d recommend the low tone version for solo use, as lower frequency sound penetrates solid objects (i.e. automotive cabins) more effectively, and carries more psychological “weight” (bigger creatures/vehicles usually have deeper voices). Granted, this is a much more subtle distinction than the six dollar price differential; at least both advantages are on the same side, so go low.

FIAMM Technologies, Inc., 1550 Leeson Ave., Cadillac, MI 49601; www.fiamm.com

Hella Supertone Dual Horn Kit
$61.99 // 131.9 dB

Performance: ●●●●●
Ease of Mounting: ●○○○○
Value: ●●●●●
OVERALL RATING: ●●●●○

Type: Electromagnetic Diaphragm
Claimed sound level/frequencies: 118 dB/300 and 500Hz
Actual sound level: 131.9 dB
Power draw: 7.6A
Weight: 12 oz., each
Dimensions: 4.75” W x 2.25” D
Mounting provisions: Kit includes six brackets with hole centers 2.5” apart
Notes: 30A relay included

Model: Hella Supertone Dual Horn Kit: $61.99 at Amazon.com; red/black only
Recommended (if you can live with their size and color)
Notes: These eye-catching blood-red platters deliver the acoustic goods! If you guessed they’d be the loudest because they’re the largest, you’re right. Even with no compressor or spiral trumpet to enhance their sound pressure productivity, they achieved nearly a 1.5 dB advantage over their closest rival. Offsetting that victory is the fact that the Supertones are also the most expensive option here, costing more than twice as much as the FIAMMs they bested on the sound meter. The Supertones’ giant size is also apt to subtract from their desirability for many folks; finding room for both would be quite a challenge on most motorcycles. And not everyone will appreciate their look-at-me styling. But for those who need the very loudest, and have the requisite room and money, the Supertones are tops.

Hella Corporate Center USA, 43811 Plymouth Oaks Blvd., Plymouth, MI 48170; 743-414-0900; www.hellausa.com
Hella Twin Tone Horn Set
$25.12 // 128.1 dB

Performance: Five stars
Ease of Mounting: Four stars
Value: Five stars
OVERALL RATING: Four stars

Type: Electromagnetic diaphragm with nautilus shell amplifier
Claimed sound level/frequencies: 110dB/400 and 500Hz
Actual sound level: 128.1 dB
Power draw: 8.3A each
Weight: 17.5 oz.
Dimensions: 4” W x 2.75” D
Mounting provisions: Kit includes four brackets with hole centers 2.25” apart

Notes: 30A relay included
Model: Hella (trumpet type) Twin Tone Horn Set (TE16): $25.12 at Amazon.com; red only

If you didn’t like the crimson-painted metal frames of the Supertones, you definitely won’t like the duller red plastic of the Twin Tones—they look cheap and fragile (even though they’re made of ABS plastic, like the black FIAMMs and PIAA). Still, they performed in line with their peers, and did so at a similar price. If you need a pair of red snail shell shapes to complete your bike’s stylistic mission, these are the horns for you. Otherwise, the FIAMMs are a little louder, a little cheaper, and a lot better looking, if you ask us.

PIAA Slim-Line Sports Horn
$50.96 // 114.9 dB

Performance: Five stars
Ease of Mounting: Five stars
Value: Three stars
OVERALL RATING: Three stars

Type: Electromagnetic diaphragm with nautilus shell amplifier
Claimed sound level/frequency: 112 dB/500Hz
Actual sound level: 114.9 dB
Power draw: 2.8A
Weight: 6 oz.
Dimensions: 4.25” W x 1.6” D
Mounting provisions: Includes single bracket with hole centers 2” apart

Model: PIAA Slim-Line Sports Horn: $50.96 at Amazon.com; black only
Notes: Before you write-off the Slim-Line as an over-priced, under-performing loser, look again at its dimensions and power draw. That sleek ABS plastic housing doesn’t just look great, it also fits where other horns don’t. And if a bike’s electrical system has no margin for a more substantial power draw, the Slim-Line’s electron sipping consumption could make the difference between going aftermarket and staying stock. For those who need a (relatively) compact, efficient design that still delivers much more acoustic oomph than an OEM horn, the Slim-Line may be well worth its price.

Stebel Nautilus Dual Tone Air Horn
$49.95 // 129.3 dB

Performance: Five stars
Ease of Mounting: Five stars
Value: Four stars
OVERALL RATING: Four stars

Type: Disc diaphragm with air compressor and two nautilus shell amplifiers
Claimed sound level/frequencies: No claims found for dB or Hz, but dual-tone
Actual sound level: 129.3 dB
Power draw: 18A
Weight: 21.5 oz.
Dimensions: 4.25” H x 4.5” W x 3” D
Mounting provisions: No bracket included (mounting boss on unit). 30A relay included
Model: Stebel Nautilus Compact Motorcycle Air Horn: $49.99 plus $6.99 shipping at AdventureMotorcycleParts.com; black or chrome (+$6 from this vendor)
Notes: Contrary to what we’d read/heard about the time required for an air horn’s compressor to spool up, neither the Stebel nor Wolo’s Bad Boy exhibited any noticeable delay between button press and sound production. Maybe that problem, like turbo lag, is a thing of the past. Surprisingly, the extra size, weight, power consumption and complexity—not to mention cost—of employing compressed air doesn’t appear to yield any performance advantage, as comparable or better sound pressure levels were produced by electromagnetic models. We can imagine situations wherein it might be easier or preferable to mount one big, heavy unit instead of two smaller, lighter ones. But we can’t imagine finding a boss (on a motorcycle) suitable for hanging this horn using its included single stubby mounting bolt; expect to do some fabricating if you’ve just gotta have this air horn. Better yet, buy the Bad Boy.

Notes: 30A relay included
Model: Stebel Nautilus Compact Motorcycle Air Horn: $49.99 plus $6.99 shipping at AdventureMotorcycleParts.com; black or chrome (+$6 from this vendor)
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Notes: 30A relay included
Model: Stebel Nautilus Compact Motorcycle Air Horn: $49.99 plus $6.99 shipping at AdventureMotorcycleParts.com; black or chrome (+$6 from this vendor)
WOLO Bad Boy Dual Tone Air Horn
$31.63 // 129.0 dB

| Performance: | ★★★★☆ |
| Ease of Mounting: | ★★★★☆ |
| Value: | ★★★★☆ |
| OVERALL RATING: | ★★★☆☆ |

Type: Disc diaphragm with air compressor and two nautilus shell amplifiers
Claimed sound level/frequencies: 118dB/530 and 680Hz
Actual sound level: 129.0 dB
Power draw: 16.3A
Weight: 22.5 oz.
Dimensions: 4.25” H x 5” W x 3” D
Mounting provisions: No bracket included (mounting boss on unit)
Wolo Bad Boy Dual Tone Air Horn: $31.63 at Amazon.com; black or chrome (+$8.40 from this vendor)

Notes: 30A relay included. Although their housings have very tiny differences, and their compressor motors use slightly different amperage, the Bad Boy and Nautilus seem — for all practical purposes — identical (perhaps they differ in reliability, which we did not assess). At least with the Bad Boy you pay 44% less for the same design and performance, and it even uses slightly less power. That aforementioned risk of startling nearby drivers is no worse with these horns than it is with the stronger electromagnetic options. However, you’ll still have to find a location large enough and a mounting surface strong enough to hold these heavyweight units. Even at the Bad Boy’s price point, we see no justification for choosing the air horn option, despite the testimonies of their devoted following.

WOLO Loud One Low Tone Horn
$8.52 // 114.3 dB

| Performance: | ★★★★☆ |
| Ease of Mounting: | ★★★★☆ |
| Value: | ★★★☆☆ |
| OVERALL RATING: | ★★★☆☆ |

Type: Electromagnetic Diaphragm with ABS nautilus horn amplifier
Claimed sound level/frequency: 115 dB/410Hz
Actual sound level: 114.3 dB
Power draw: 2.9A
Weight: 9 oz.
Dimensions: 4.75” W x 2.75” D
Mounting provisions: Includes two brackets with hole centers 2.5” apart
Model: WOLO Loud One Low Tone Horn: $7.41 (with free shipping) at ZoroTools.com; black only

Notes: Can be paired with high tone version ($8.52 from this vendor); 30A relay (purchased separately) recommended if running dual horn setup

With the lowest price here, nearly the lowest power draw, and a big performance advantage over most OEM horns, the Loud One would deserve serious consideration — if not for the fact that a mere $1.65 will buy a whopping 13.5 dB of additional sonic power in the form of the FIAMM low tone horn. And chances are your charging system can manage the additional 1.5 amps. ’Nuff said.

Wolo Manufacturing Corp., 1 Saxwood St., Deer Park, NY 11729; 800-645-5808; www.wolo-mfg.com

HOOKING UP

Universal Plug-n-Play Wiring Harness for Motorcycle Air Horns – $26.97 at Amazon.com Includes heavy duty 40A relay, 30A fuse/holder, wire ties, insulated terminals, quick-splice connectors, 5’ of wiring (sheathed), and instructions.

If you’re just swapping your OEM horn for one of the single electromagnetic units, you can almost certainly plug-n-play. If your stock horn uses its mounting bolt as a ground instead of a “negative” wire back to the bike’s wiring harness, you’ll have to link one of the new horn’s posts to an appropriate grounding spot (perhaps the same mounting bolt). Some horns come with a short jumper for exactly this purpose. If you’re switching to a dual tone setup or an air horn, it will need more juice. This means employing a relay controlled by the original horn circuit. Although the dual and air horns shown here come with relays, they don’t include the additional wiring required. Running the extra wires isn’t rocket science, nor is it expensive. But for those who want a (nearly) turn-key installation experience, we can recommend this ready-made setup.