

TWIN CAM 96 SLIP-ON TESTING

WORDS: Billy Bartels & Mark Masker

PHOTOS: Billy Bartels

We may look perfect, but we're only human

Most magazines have an air of infallibility about them, like their poop don't stink and they walk on a cushion of air. We're here to tell you that our poop stinks as much as the next coffee-guzzling biker, and we're not light in our engineer boots, either. Under a time crunch and looking to get the most bang for our buck, we believed a rumor (supposedly sourced at H-D itself) that the new closed-loop fuel-injection system that comes on the '07 Twin Cam 96 will adapt to minor tweaks such as swapping out pipes without a hiccup.

Once we began collecting said pipes, we started hearing that the basis for our whole comparison was patently untrue and that the TC-96, if anything, needs a program upgrade more than the old TC-88. Luckily, a friend of BAGGERS (Mike Kuhns) came through with a pristine '07 Street Glide that had been given Harley's Screamin' Eagle Stage 1 program and air filter.

No, this is not a perfect solution, as ideally you'd want to spring for H-D's full-on Race Tune and calibrate the injection to your pipes. However, we feel this test is valid, in that there are probably a majority of you who aren't going to go to the sort of expense that involves and really would just like your bike to run (and sound) right. As the SE



Only eight more to go...

mods are by far the most popular in the business, most should be well served by this test. Slackers, this test is for you!

Our dyno testing involved three runs each in Fourth gear on the same day. Bartels' H-D's Dynojet 250i dynamometer provided not only horsepower and torque figures, but let us know the air/fuel ratio as well, so we'd know quickly if the SE Stage 1 program was not getting the job done (it did).

For those of you unfamiliar with the mysteries of reading a dyno chart, try not to pay too much attention to the overall horsepower figure, as most riders rarely rev up their touring machines that high unless they're attempting to set off car alarms or break windows. The

midrange torque is far more important.

Speaking of breaking windows, we sound tested as well, using the SAE-approved method. With the meter at 20 inches, the exit of one pipe at a 45-degree angle, and the pickup parallel to the direction of the soundwave to reduce distortion, the bike was then revved in Neutral to 1/2 of redline. In the case of the stock TC-96, that's 2,250 rpm, although our test unit had its limit raised (via the SE upgrade) to 6,000. We'll do a full article in a later issue on the methodology we use. What's important is that all the pipes were tested in an identical manner, so we're giving you a relative indicator of the sound at the given rpm.

The last test performed was the ol' bathroom scale. In case you're interested in how much your 800-plus-pound touring machine weighs, we'll even clue you in to how much ballast you'll be dropping (or gaining) with these pipes.

In our next issue, we'll start testing individual complete horsepower setups with proper calibration... just like we know what we're doing. Doubters, know-it-alls, and conspiracy theorists are welcome to send helpful suggestions to baggermag@primedia.com. We'll take all serious comments seriously.

Special thanks to Memphis Howard for all of your help swapping pipes and working the dyno.

Stock Harley-Davidson

MAKE/MODEL:	HARLEY-DAVIDSON STOCK MUFFLER
CONTACT:	YOUR LOCAL HARLEY DEALER - WWW.HARLEYDAVIDSON.COM
PART NO.:	65547-07 (LEFT), 65354-07 (RIGHT)
PEAK HP:	6723 @ 5,250 RPM
PEAK TORQUE:	81.98 LB-FT @ 3,500 RPM
SOUND OUTPUT:	93 DB
WEIGHT:	18 LBS
MSRP:	\$320 (LEFT), \$346 (RIGHT) (MUCH LESS AT THE LOCAL SWAP MEET)

We heard another rumor from a couple of well-placed sources that the left stock muffler was considerably more open than the right to help balance the pressure from the two cylinders. We couldn't confirm this by non-destructive means, as they both weighed exactly 9 pounds. However, compared to the pipes on a TC-88, the TC-96 pipes really rumble! They crank out nearly as much sound as some of the pipes in the test; however, under load they don't pick up the volume in the same way as most aftermarket pipes do. They also don't perform like them. These runs were done on a bone-stock machine for sake of a base-line comparison with the lightly modified machine that the rest of the pipes were run on.

The stock pipes' run is included in all the other pipes' runs for comparisons.

ROOM TEMP: 65.67° F
HUMIDITY: 75%
SAE: 0.97
AVERAGE GEAR RATIO: 53.97

TIME	RPM X 1K	HP	LB-FT	AIR/FUEL
0.55	2.25	33.37	77.90	13.74
0.91	2.50	38.13	80.11	13.76
1.28	2.75	41.39	79.05	13.85
1.64	3.00	45.96	80.46	13.70
2.01	3.25	50.61	81.79	13.58
2.37	3.50	54.63	81.98	13.49
2.73	3.75	58.39	81.78	13.4
3.10	4.00	61.11	80.24	13.44
3.48	4.25	62.84	77.66	13.42
3.88	4.50	65.68	76.66	13.51
4.29	4.75	66.67	73.72	13.56
4.73	5.00	66.94	70.31	13.61
5.20	5.25	67.23	67.26	13.47
5.71	5.50	65.64	62.68	13.33
MAX:				
5.71	5.50	67.23	81.98	13.85

PERFORMANCE RANKINGS

HORSEPOWER

KERKER:	75.54 @ 5,500 RPM
SUPERTRAPP:	75.12 @ 5,000 RPM
SAMSON:	75.08 @ 5,250 RPM
FREEDOM:	75.07 @ 5,500 RPM
TS ENGINEERING (CLOSED):	74.42 @ 5,000 RPM
PHANTOM:	73.80 @ 5,000 RPM
BASSANI:	73.39 @ 5,250 RPM
DRAG SPECIALTIES PYTHON:	72.64 @ 5,250 RPM
TS ENGINEERING (OPEN):	72.27 @ 5,250 RPM
STOCK HARLEY-DAVIDSON:	67.23 @ 5,250 RPM

TORQUE

SUPERTRAPP:	90.24 LB-FT @ 3,500 RPM
SAMSON:	89.96 LB-FT @ 3,500 RPM
KERKER:	89.41 LB-FT @ 3,250 RPM
FREEDOM:	88.91 LB-FT @ 3,500 RPM
TS ENGINEERING (OPEN):	88.85 LB-FT @ 3,250 RPM
BASSANI:	88.43 LB-FT @ 3,500 RPM
DRAG SPECIALTIES PYTHON:	88.07 LB-FT @ 3,250 RPM
TS ENGINEERING (CLOSED):	87.22 LB-FT @ 3,250 RPM
PHANTOM:	86.86 LB-FT @ 3,250 RPM
STOCK HARLEY-DAVIDSON:	81.98 LB-FT @ 3,500 RPM

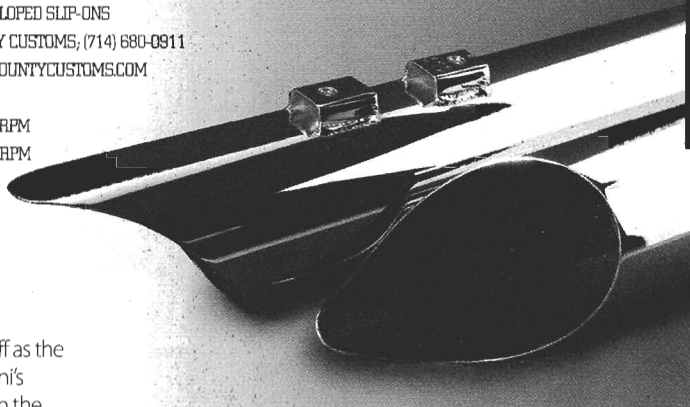
SOUND (FROM SOFTEST TO LOUDEST)

STOCK HARLEY-DAVIDSON:	93dB
HUSHER (CLOSED):	94dB
SUPERTRAPP:	94.5dB
PHANTOM:	95dB
HUSHER (OPEN):	95.5dB
BASSANI:	98dB
KERKER:	98dB
SAMSON:	99dB
FREEDOM:	101dB
PYTHON:	102dB



Bassani

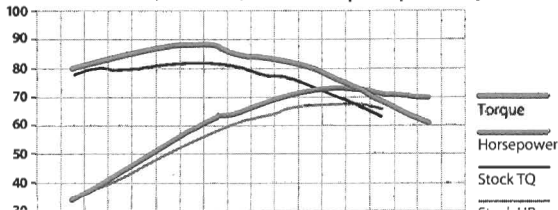
MAKE/MODEL:	BASSANI SCALLOPED SLIP-ONS
CONTACT:	NORTH COUNTY CUSTOMS; (714) 680-0911 WWW.NORTHCOUNTYCUSTOMS.COM
PART NO.:	N/A
PEAK HP:	73.39 @ 5,250 RPM
PEAK TORQUE:	88.43 @ 3,500 RPM
SOUND OUTPUT:	98 DB
WEIGHT:	18 LBS
MSRP:	\$469



Regarded by most of the staff as the prettiest of the bunch, Bassani's scalloped pipes performed in the middle of the crowd in all categories. They provide even, noticeable gains across the torque spectrum compared to the stock mufflers.

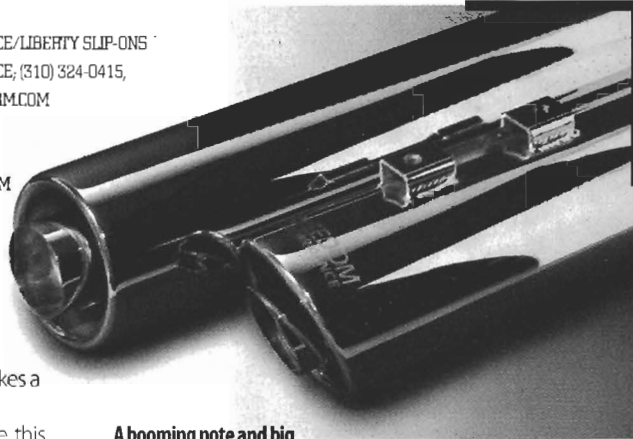
The scalloped slip-ons feature tunable, removable baffles and a very nice chrome finish. They slipped into place easily the way a good slip-on should.

Moderate sound, nice finish, and a overall power pick-me-up



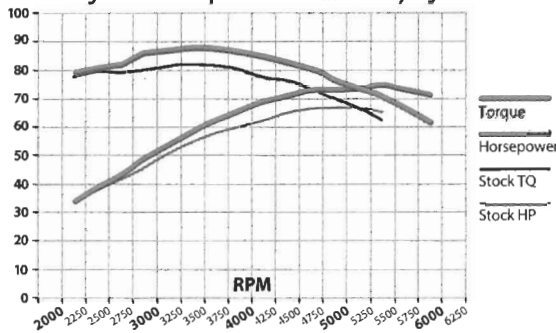
Freedom

MAKE/MODEL: FREEDOM PERFORMANCE/LIBERTY SLIP-ONS
CONTACT: FREEDOM PERFORMANCE; (310) 324-0415, WWW.FREEDOMPERFORM.COM
PART NO.: N/A
PEAK HP: 75.07 @ 5,500 RPM
PEAK TORQUE: 88.91 LB-FT @ 3,500 RPM
SOUND OUTPUT: 101 DB
WEIGHT: 18 LBS
MSRP: \$485



A new manufacturer, Freedom makes a unique take on the dresser muffler. Designed to be a pipe within a pipe, this chambered baffle design creates a virtually blueproof barrier (or so the company claims). If you like 'em loud (and you come from someplace where they don't harass you because of it), this could be your pipe. It clocked in near the tops in sound and performance, with a nice spread of torque through the midrange. Installation was a breeze, as these solid pipes lined right up and slid right on. Freedom's background is in chrome plating, so you know the plating was thick and good-looking on these units.

A booming note and big midrange balances unique double-chambered styling

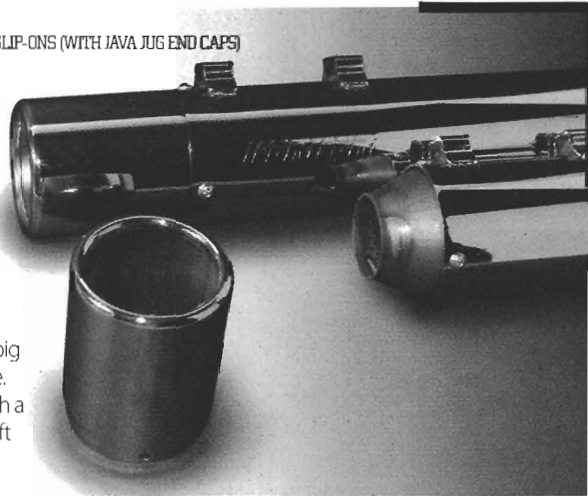


ROOM TEMP: 67.23° F
HUMIDITY: 29%
SAE: 0.96
AVERAGE GEAR RATIO: 54.36

TIME	RPM X 1K	HP	LB-FT	AIR/FUEL
0.24	2.00	N/A	N/A	15.31
0.59	2.25	34.26	79.97	15.03
0.92	2.50	38.87	81.66	14.62
1.25	2.75	43.39	82.87	14.41
1.60	3.00	49.87	87.30	14.39
1.92	3.25	54.38	87.88	14.22
2.26	3.50	59.25	88.91	14.46
2.59	3.75	63.14	88.43	14.45
2.92	4.00	66.47	87.28	14.56
3.25	4.25	69.46	85.84	14.43
3.59	4.50	71.63	83.60	14.38
3.95	4.75	73.72	81.52	14.30
4.32	5.00	73.49	77.20	14.44
4.71	5.25	74.43	74.46	14.09
5.12	5.50	75.07	71.69	14.10
5.57	5.75	73.24	66.90	14.08
6.04	6.00	71.59	62.67	14.07
MAX:				
6.04	6.00	75.07	88.91	15.31

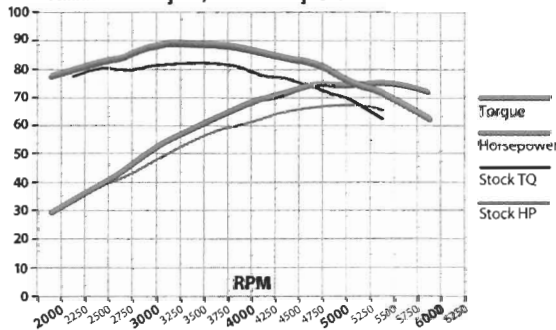
Kerker

MAKE/MODEL: KERKER/DOUBLE ESPRESSO SLIP-ONS (WITH JAVA JUG END CAPS)
CONTACT: KERKER; (216) 265-8400, WWW.SUPERTRAPP.COM
PART NO.: 128-78001
PEAK HP: 75.54 @ 5,500 RPM
PEAK TORQUE: 89.41 LB-FT @ 3,250 RPM
SOUND OUTPUT: 98 DB
WEIGHT: 8 LBS (LEFT MUFFLER); 9 LBS (RIGHT MUFFLER)
MSRP: \$427



Kerker's Double Espresso slip-ons have a combination that will drive some mad: big power and a big, booming exhaust note. Kerker's obviously did its homework, with a lighter (and we'd guess less restrictive) left pipe complementing a backpressure-inducing right. The Espressos were our horsepower kings, and laid down torque within a few tenths of the best of them. Their old-school "boomcan" design is not going turn every rider on, but they're simple and very effective. Installation note: These pipes are made from very soft metal, so take care not to bend the intake during installation. Unlike every other pipe in this test (except the Supertrapp), the rear mounts' nuts are not welded in place but have to be held in place during installation, which can cause some swearing... especially if you lose one.

Installation was a pain, but these slip-ons delivered where it counted.



ROOM TEMP: 66.32° F
HUMIDITY: 15%
SAE: 0.95
AVERAGE GEAR RATIO: 54.41

TIME	RPM X 1K	HP	LB-FT	AIR/FUEL
0.29	2.00	29.70	77.98	16.00
0.62	2.25	34.63	80.83	15.25
0.96	2.50	39.57	83.13	14.91
1.29	2.75	44.22	84.44	14.80
1.64	3.00	50.25	87.98	14.65
1.97	3.25	55.33	89.41	14.65
2.30	3.50	59.31	89.00	14.63
2.62	3.75	63.34	88.71	14.59
2.94	4.00	66.96	87.92	14.61
3.27	4.25	69.88	86.35	14.43
3.61	4.50	72.22	84.29	14.32
3.96	4.75	74.99	82.92	14.30
4.33	5.00	75.18	78.97	14.19
4.71	5.25	74.79	74.92	14.19
5.11	5.50	75.54	72.14	14.10
5.55	5.75	74.10	67.88	14.13
6.02	6.00	71.91	62.95	14.20
MAX:				
6.02	6.00	75.54	89.41	16.00

Phantom

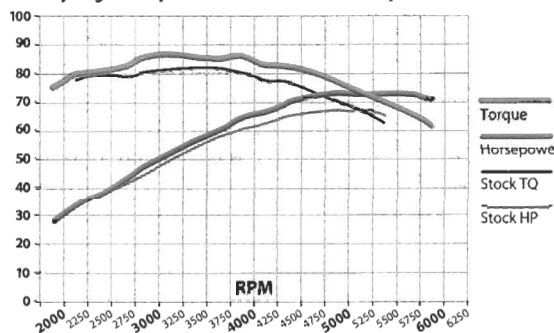
MAKE/MODEL: PHANTOM/ROLLED TIP SLIP-ONS
CONTACT: KNJ ASSOCIATES, LLC, (800) 489-2224
PART NO.: N/A
PEAK HP: 73.80 @ 5,000 RPM
PEAK TORQUE: 86.86 LB-FT @ 3,250 RPM
SOUND OUTPUT: 95 DB
WEIGHT: 16 LBS
MSRP: \$699.95 (\$599 AT EVENT)



Phantom slip-ons are not chromed like every other pipe in this test. Instead, they are made by creators KNJ Associates from stainless steel, which is then polished to an almost chrome-like glow. The all-over polishing gave the pipes a more complete look than most, as even the insides of the tips were finished. Performance is off the leaders in horsepower and last in torque with an uneven performance across the board. Sound was extremely modest, with only a slight bump over stock, but with a much nicer tone.

Installation was easy, as the steel cans went on without too much fuss.

The Phantoms offer only a light bump over stock in both sound and power



ROOM TEMP: 67.52° F
HUMIDITY: 29%
SAE: 0.96
AVERAGE GEAR RATIO: 54.34

TIME	RPM X 1K	HP	LB-FT	AIR/FUEL
0.37	2.00	28.86	75.79	15.47
0.72	2.25	34.34	80.17	14.54
1.07	2.50	38.61	81.10	14.19
1.41	2.75	43.30	82.70	14.32
1.75	3.00	49.36	86.41	14.48
2.10	3.25	53.75	86.86	14.49
2.44	3.50	57.61	86.44	14.56
2.77	3.75	60.97	85.25	14.44
3.10	4.00	65.89	86.51	14.21
3.44	4.25	67.45	83.35	14.16
3.79	4.50	71.02	82.89	14.10
4.15	4.75	72.97	80.69	13.95
4.52	5.00	73.80	77.52	13.92
4.92	5.25	73.72	73.75	13.92
5.34	5.50	73.54	70.23	3.90
5.79	5.75	73.53	67.16	13.98
6.26	6.00	71.10	62.24	13.90
MAX:				
6.26	6.00	73.80	86.86	15.47

Samson

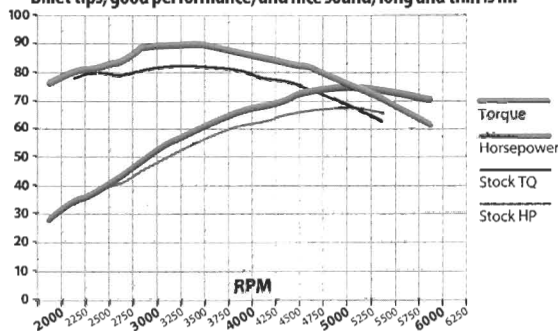
MAKE/MODEL: SAMSON EXHAUST/SILVER BULLET LONG TAPER SLIP-ONS
CONTACT: SAMSON EXHAUST, (888) 572-6722, WWW.SAMSONUSA.COM
PART NO.: M-156
PEAK HP: 75.08 @ 5,250 RPM
PEAK TORQUE: 89.96 LB-FT @ 3,500 RPM
SOUND OUTPUT: 98 DB
WEIGHT: 16 LBS
MSRP: \$439.95



These pipes show that volume is everything. They're the only one of the louder pipes to show up at the top of our survey in terms of overall performance. While skinny in cross-section, they extend well past the ends of the bags and end in some even more extended billet tips. If you want people to notice your slip-ons (or just trip on them), these are the ones to own!

Power comes on soft at the bottom but hits hard at 3,000 rpm, carrying through all the way to the top end, in what is arguably the prettiest torque curve in the test. Installation was easy, as they practically fell on the head pipes. For a pipe with billet tips, the price is extremely wallet-pleasing as well.

Billet tips, good performance, and nice sound, long and thin is in!



ROOM TEMP: 65.25° F
HUMIDITY: 9%
SAE: 0.95
AVERAGE GEAR RATIO: 54.41

TIME	RPM X 1K	HP	LB-FT	AIR/FUEL
0.24	2.00	29.07	76.33	16.51
0.58	2.25	34.46	80.44	15.80
0.92	2.50	39.04	82.01	15.25
1.24	2.75	44.07	84.17	14.87
1.59	3.00	50.83	88.99	14.78
1.92	3.25	55.59	89.83	14.81
2.26	3.50	59.95	89.96	14.77
2.57	3.75	63.79	89.33	14.64
2.89	4.00	66.83	87.75	14.69
3.23	4.25	69.42	85.79	14.55
3.56	4.50	71.95	83.97	14.48
3.91	4.75	74.82	82.73	14.48
4.27	5.00	74.91	78.69	14.43
4.66	5.25	75.08	75.11	14.42
5.06	5.50	74.57	71.21	14.20
5.50	5.75	72.71	66.41	14.18
5.97	6.00	71.39	62.49	14.22
MAX:				
5.97	6.00	75.08	89.96	16.51

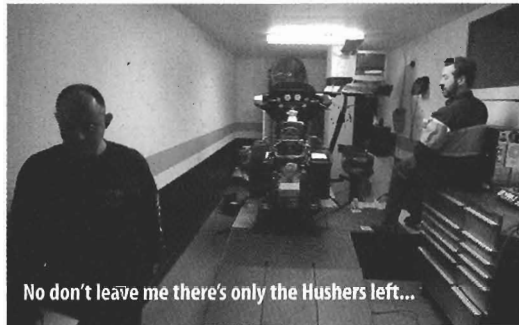


SuperTrapp

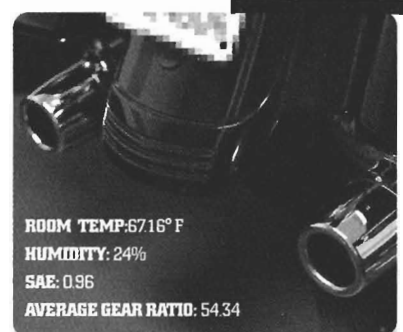
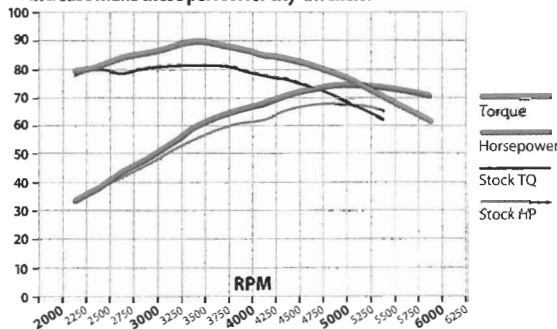
- MAKE/MODEL:** SUPERTRAPP/SE SERIES SLIP-ONS
- CONTACT:** SUPERTRAPP INDUSTRIES, (216) 265-8400, WWW.SUPERTRAPP.COM
- PART NO.:** 128-65115, END CAPS: 108-8029
- PEAK HP:** 75.12 @ 5,000 RPM
- PEAK TORQUE:** 90.24 @ 3,500 RPM
- SOUND OUTPUT:** 94.5 DB
- WEIGHT:** 9 LBS (LEFT), 10 LBS (RIGHT)
- MSRP:** \$366 (SHOWN WITH FLUTED BILLET END CAPS, \$60 EACH)

The SuperTrapp slip-ons were the intersection where minimal sound and high performance met. Scarcely louder than stock (but with a much better sound), the SuperTrapps are the ideal solution for those of you who have neighbors nearby, or who like to go on long tours in a half (or no) helmet. They also reach their torque peak earlier (and more abundantly) than the others, which is where most will use it, so keeping even quieter by short-shifting is easy to do. Unlike many torque-centric pipes, these deliver the horsepower as well.

As with a couple of the other pipes here, they come with an internal heat shield. The end caps are interchangeable with the ones on the Kerker, as well as the old H-D Screamin' Eagle pipes of the '90s. There are lots of looks to be had with these, including fishtail, slash-cut, and a variety of billet designs. They share basic architecture with the Kerker units, including the non-welded rear mounting nuts, which make for a slightly more aggravating installation than the other pipes.

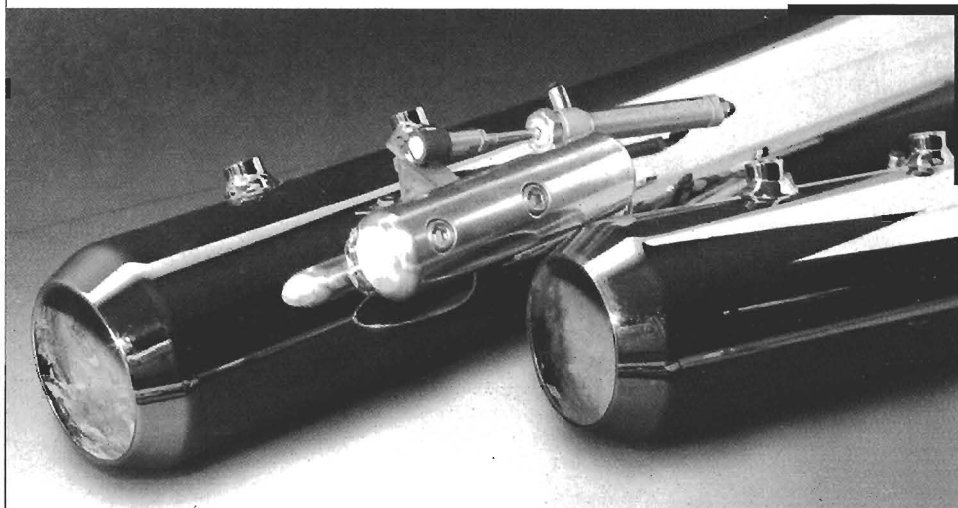


Big power and only a moderate sound increase make these perfect for city-dwellers.



ROOM TEMP: 67.16° F
 HUMIDITY: 24%
 SAE: 0.96
 AVERAGE GEAR RATIO: 54.34

TIME	RPM X 1K	HP	LB-FT	AIR/FUEL
0.48	2.25	34.06	79.50	15.41
0.81	2.50	38.76	81.43	14.68
1.14	2.75	44.28	84.58	14.48
1.50	3.00	48.92	85.65	14.34
1.83	3.25	54.23	87.63	14.46
2.16	3.50	60.14	90.24	14.48
2.48	3.75	63.71	89.23	14.51
2.81	4.00	66.60	87.45	14.44
3.15	4.25	68.87	85.10	14.38
3.49	4.50	71.84	83.85	14.06
3.84	4.75	73.64	81.43	14.40
4.21	5.00	75.12	78.91	14.17
4.60	5.25	74.86	74.89	14.07
5.00	5.50	73.95	70.62	13.96
5.45	5.75	72.77	66.47	13.96
5.92	6.00	70.91	62.07	13.94
MAX:				
5.92	6.00	75.12	90.24	15.41



TS Hushers

MAKE/MODEL: TS ENGINEERING/HUSHERS
CONTACT: TS ENGINEERING; (262) 705-8482, WWW.HUSHERSEXHAUST.COM
PART NO.: N/A
PEAK HP: 72.27 @ 5,250 RPM (OPEN); 74.42 @ 5,000 RPM (CLOSED)
PEAK TORQUE: 88.85 LB-FT @ 3,250 RPM (OPEN); 87.23 LB-FT @ 3,250 RPM (CLOSED)
SOUND OUTPUT: 95.5 DB (OPEN); 94 DB (CLOSED)
WEIGHT: 28 LBS (PIPES ONLY); 29 LBS (FULL GEAR)
MSRP: \$347.99

Easily the most unique, complex, and expensive pipes in the test, the TS Engineering Hushers are for the rider who wants it all. With a small pump and a pair of remote-controlled air pistons, an internal butterfly can switch the pipe from straight-through to a stock-style closed baffle at the flick of a switch. Also, the design allows for tunability, with the installer able to set the angle of the butterflies for maximum performance. It was interesting to note that, despite popular thinking that backpressure creates torque and open pipes are for horsepower, the opposite was true with these pipes, as the closed setting produced a better outright horsepower result.

The sound on these pipes was toward the quiet end of the spectrum open or closed, sounding really good under load when open, and stocklike when closed.

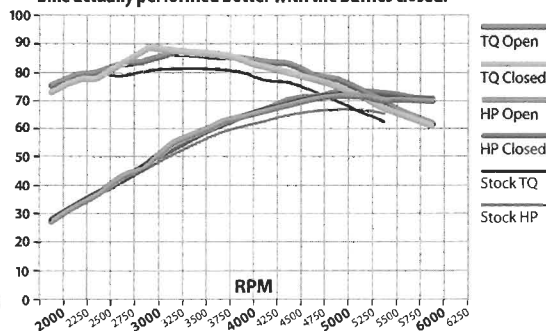
We didn't interrupt our quickie dyno test with the Hushers' two-hour install time; instead, we just pegged the flaps open or closed for the dyno runs and sound test. We were unable to test air/fuel on the closed pipes, as that would have involved opening the butterfly slightly to get access to the spent gas.

We will definitely be revisiting this product with a full install in the future.



Above:
Apparatus Maximus!
 The Hushers' versatility is paid for with a 2-hour install

Ironically, the stage-one chipped bike actually performed better with the baffles closed.



Hushers Open

ROOM TEMP: 66.70° F
 HUMIDITY: 35%
 SAE: 0.96
 AVERAGE GEAR RATIO: 54.28

TIME	RPM X 1K	HP	LB-FT	AIR/FUEL
0.31	2.00	28.08	73.75	16.12
0.66	2.25	33.47	78.13	15.67
1.00	2.50	37.66	79.12	15.22
1.36	2.75	43.98	83.99	14.78
1.70	3.00	47.51	83.19	14.57
2.04	3.25	54.98	88.85	14.27
2.38	3.50	58.37	87.59	14.46
2.71	3.75	62.39	87.38	14.46
3.04	4.00	64.81	85.10	14.35
3.39	4.25	67.23	83.09	14.51
3.74	4.50	69.31	80.90	14.39
4.11	4.75	71.45	79.00	14.30
4.49	5.00	72.13	75.77	14.25
4.89	5.25	72.27	72.23	14.23
5.32	5.50	71.04	67.84	14.11
5.77	5.75	71.22	65.05	14.03
6.26	6.00	70.73	61.92	13.97
MAX:				
6.26	6.00	72.27	88.85	16.12

Hushers Closed

ROOM TEMP: 65.86° F
 HUMIDITY: 36%
 SAE: 0.96
 AVERAGE GEAR RATIO: 54.34

TIME	RPM X 1K	HP	LB-FT	AIR/FUEL
0.27	2.00	28.86	75.79	N/A
0.61	2.25	34.10	79.59	N/A
0.96	2.50	38.31	80.49	N/A
1.29	2.75	43.68	83.43	N/A
1.66	3.00	48.31	84.58	N/A
2.01	3.25	53.98	87.23	N/A
2.34	3.50	57.88	86.85	N/A
2.67	3.75	61.61	86.29	N/A
3.00	4.00	65.05	85.41	N/A
3.34	4.25	68.24	84.33	N/A
3.69	4.50	71.36	83.29	N/A
4.05	4.75	72.01	79.63	N/A
4.42	5.00	74.42	78.17	N/A
4.81	5.25	74.03	74.06	N/A
5.23	5.50	73.49	70.18	N/A
5.67	5.75	72.17	65.92	N/A
6.15	6.00	71.64	62.71	N/A
MAX:				
6.15	6.00	74.42	87.23	N/A