

LOS ANGELES COUNTY SHERIFF'S DEPARTMENT



LAW ENFORCEMENT MOTORCYCLE TEST AND EVALUATION PROGRAM

**2015 MODEL
YEAR**

Jim McDonnell, SHERIFF

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INTRODUCTION

The Los Angeles County Sheriff's Department first implemented its police vehicle testing program in 1974, and motorcycle testing in 2008. Since that time, our Department has become nationally recognized as a major source of information relative to police vehicles and their use.

This year's motorcycle evaluation was conducted October 14th – 17th, 2014 by the Los Angeles County Sheriff's Department.

All major manufacturers of police motorcycles were invited to participate. BMW, Harley-Davidson, Honda and Victory each submitted motorcycles for evaluation. The motorcycles submitted were:

- *2014 Honda ST 1300-PA
- *2015 BMW R 1200 RT-P
- *2015 Harley-Davidson Electra Glide
- *2015 Harley-Davidson Road King
- *2015 Harley-Davidson Electra Glide Special
- *2015 Victory Commander 1
- *2015 Moto-Guzzi California 1400
- *2015 Moto-Guzzi Norge
- *2015 Zero Electric DSP

All of the motorcycles submitted completed the test satisfactorily.

The testing process is designed to address the law enforcement officer's operational requirements in terms of motorcycle performance, safety, and comfort. The fleet maintenance interest is addressed by performing an extensive mechanical evaluation on each motorcycle submitted.

Each test is designed and executed to simulate actual field use conditions as closely as possible. Law enforcement motorcycle personnel conduct the evaluations on city streets, freeways, and the performance track.

This book is not intended as a recommendation for any specific motorcycle contained within, nor is it designed to rank the motorcycles in any order. Our motorcycle testing program is conducted in order to accomplish two primary goals. To provide law enforcement agencies with the data necessary to assist those in the motorcycle selection process, and to provide the various motorcycle manufacturers with the input necessary to better meet the needs of law enforcement.

We recognize the fact that individual agency needs can be influenced by cost, operational considerations and other factors. As such, interpretation of test results is the responsibility of each agency, and should be made based upon that agency's needs.

It is our goal to provide law enforcement agencies with the information they require to successfully evaluate and select the right motorcycle for their needs. We believe that we have accomplished that goal.

ACKNOWLEDGEMENTS

The Los Angeles County Sheriff's Department, Fleet Management Bureau would like to thank all those who have contributed their time and efforts in making this year's test a success.

Motorcycle Test Track Riders

Dep. Shawn Bryant LASD
Dep. Jeffery Houle LASD
Dep. Hector Renteria LASD

Ofc. Vic Madrano LAPD
Ofc. Mitch Nowlen LAPD

Motorcycle Manufactures

BMW Police Motorcycles
Huntington Beach Honda Police Motorcycles
Victory Police Motorcycles

Harley Davidson Police Motorcycles
Piaggio Group Americas (Moto Guzzi)
Zero Police Motorcycle

Support Personnel

LASD Food Services
LASD Sign Shop
LASD Print Shop
LASD Video Production Unit
LASD Web Development Unit
Reserve Forces Bureau
ASAP Team
AERO Bureau
Max Thomson (Test Consultant)
Hiroshi Aramaki (Test Director)
Rochelle Kidd (Vendor Coordinator)
Guadalupe La Voie, LET

Yolanda Gomez, LET
Marcia Molinari, LET
Kalila Lujan, OAI
Lorena Sigala, OAI
Dep. Jeff Tesdahl (EOB)
Dep. Steve Woolum (SSB)
Juan Amaya (FSB)
Joe Rosales (EVOC)
Sgt. Michael Jones (TSB)
Bruce Wheeler (Penske)
Robert Yip (Penske)
Joe Shuping (Penske)

Motorcycle Test Sponsors

Federal Signal
Link Engineering
McPeck Dodge of Anaheim
RaceLogic, USA
Setina Manufacturing
West Coast Lights & Sirens
Westin Automotive

We would like to give a special thank you to the Auto Club Speedway Administrative Service Director, Brian Geye and his staff.

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Adamson Police Products

Air-El

B&B Enterprises

BMW Motorrad, U.S.A

Chrysler LLC. Law Enforcement

Crosssco / Code 3 Products

Cooks Communications Corp

Dura Tech U.S.A, Inc.

Factory Motor Parts

Federal Signal

Ford Motor Company Police Vehicles

General Motors Police Program

Harley Davidson Motor Company

Havis Inc.

Huntington Beach Motorsports

Jotto Desk

Lehr Auto Electric

Link Engineering Company

Mcpeeks Dodge of Anaheim

O' Reilly Auto Parts

Piaggio Group Americas, Inc.

Pro-Gard Products, LLC.

Raceway Ford

Raybestos

Setina Mfg.

Sound Off Signal

Stalker Radar

Streaming Networks, Inc.

Stop Tech, Ltd.

Supersprings International

Tactical Command Cabinets

Tomar Electronics Inc.

Troy Products

West Coast Lights and Siren Inc

Westin Public Safety Products

Zero Motorcycles

911 Circuits

10-8 Retrofit Inc.

Victory Police Motorcycles

Tuffy Security Products

MOTORCYCLE EVALUATION PROTOCOL

32 LAP HIGH-SPEED COURSE **TEST RIDER'S SUBJECTIVE EVALUATION**

This evaluation is conducted on a high-speed riding course. It is designed to evaluate, identify and eliminate the obvious unacceptable motorcycles (i.e., those motorcycles that are demonstrably unstable or otherwise exhibit unsafe characteristics).

For this evaluation, four riders are utilized for each motorcycle. Each rider completes eight laps around our 1.46 mile test track at the Auto Club Speedway in Fontana, for a total of 32 timed laps. Lap timing is via a GPS based Race Logic "Drift Box 02" with a "Video VBOX" Data logger" utilized for secondary lap timing. Both Data logger units are mounted on the motorcycle. The fastest and the slowest lap times are eliminated, the remaining six lap times are averaged. The average time and speed are recorded next to the rider's name.

Four Emergency Vehicle Operations Center motorcycle training instructors, two each from the Los Angeles County Sheriff's Department and Los Angeles Police Department, share the riding and evaluation of these motorcycles.

At the conclusion of the preliminary handling portion of the evaluation, each rider completes a "Rider's Subjective Evaluation" form. If the motorcycle is judged unacceptable in this preliminary review, it is rejected and not subjected to further evaluation.

PURSUIT COURSE

This evaluation is for motorcycles identified by the manufacturer as intended for law enforcement use. This evaluation is conducted on a closed 2.6 mile city street course which closely represents the environment most urban law enforcement agencies must contend with. The course has several straight-a-ways and consists of multiple right and left turns and obstacles in the roadway.

This is the final track evaluation, and the manufacturers, if they so choose, are allowed to rebuild the motorcycles brake system prior to this portion of the evaluation process.

For this evaluation, two riders are utilized for each motorcycle. Each rider completes two laps around the city or "pursuit" course. Lap timing is via a GPS based "VBOX Datalogger" timing device, mounted on the motorcycle. The combined times of the two laps are recorded next to the rider's name.

BASIC MOTORCYCLE PATTERNS

Five circle patterns will be used to determine each motorcycle's minimum turning radius. The diameters of the circles will be 20, 19, 18, 17 and 16 feet. The circle pattern will be entered at a speed of 2-3 mph. Once inside the circle, the rider will make three revolutions in one direction, exit the circle and make three more revolutions in the opposite direction. The circle pattern will be ridden in first gear.

Each motorcycle will be ridden in five different 180 degree U-Turn patterns. The diameters of the U-Turns will be 20, 19, 18, 17, and 16 feet. The U-Turn will be entered at a speed of 2-3 mph in first gear. The rider will fully turn the handlebars and lean the motorcycle as necessary to complete the turn. This is done in both directions.

The 30 mph cone weave consists of seven sets of three cones each, alternately offset from a center line at 36 foot intervals. The rider will approach the pattern from a sufficient distance to establish and maintain a speed of 30 mph. Using counter steering, the rider will weave the motorcycle around the seven sets of cones maintaining 30 mph, plus or minus 2 mph. The 30 mph cone weave represents steering or negotiating around debris or other hazards on the roadway.

The Short Cone Weave pattern utilizes eight single cones placed in a straight line at various distances. The cones will be placed at 11, 10 ½, 10 and 9 ½ foot intervals measured from cone center to cone center. The rider will negotiate the cone weave at about 1-2 mph in first gear, utilizing the rear brake as needed. Lock-to-lock turns will be used to successfully ride the course. This exercise represents typical motorcycle maneuverability used in slow-speed enforcement riding.

All of the Basic Motorcycle Pattern Evaluation protocols will be conducted by all four riders.

ACCELERATION PERFORMANCE EVALUATION

This evaluation is designed to measure motorcycle performance and control in terms of acceleration, including speed and time elapsed at the quarter mile. Although the top speed is not recorded, a minimum speed of 100 mph is generally obtained to satisfy the requirements for high-speed law enforcement patrol. Special attention will be paid to overall acceleration, stability, loss of rear wheel traction, and whether or not the front wheel lifts off the ground uncontrollably. Three runs will be made with each motorcycle. The results will be averaged.

All of the information gathered during the acceleration evaluation is gathered using a RaceLogic Drift box 02 Datalogger". The "Datalogger" is a GPS based measuring device. This electronic device measures distance, time and speed.

BRAKE EVALUATION

This evaluation procedure measures the braking response and efficiency of the motorcycle. There are three different brake evaluations: A hard braking evaluation, a transitional braking evaluation from a dry to a wet surface, and a transitional braking evaluation from a smooth surface to a sandy surface.

Stopping distance is recorded electronically via a GPS based VBOX Datalogger.

The hard brake evaluation is conducted by first accelerating the motorcycle to 80 MPH, then decelerating to a stop, maintaining an average deceleration rate of 22 feet per second. This procedure is repeated three additional times. The motorcycle is then immediately accelerated to 60 mph and then stopped as quickly as possible, simulating a panic stop. That stopping distance is measured and recorded.

During the dry/wet braking evaluation, the motorcycle will be accelerated to 40 mph, and at a predetermined position, the brakes will be applied. The entire brake application will begin on a dry roadway surface, immediately transitioning onto a wet roadway surface while bringing the motorcycle to a full stop. Controllability of the motorcycle and its ABS operation will be evaluated.

During the debris field braking evaluation, the motorcycle will be accelerated to 40 mph, and at a predetermined position, the brakes will be applied. The entire brake application will take place on a smooth roadway surface, immediately transitioning to a roadway strewn with sand and gravel while bringing the motorcycle to a full stop. Controllability of the motorcycle and its ABS operation will be evaluated.

If a brake malfunction is experienced (i.e., severe brake fading), an effort is made to detect the cause of the brake failure. If it is decided that the failure is inherent in the engineering of the brake system of the motorcycle, the evaluation is discontinued and the motorcycle is disqualified from further evaluation. If the failure is associated with a correctable situation, it is corrected and the evaluation is run again. The defect and any remedial action taken are noted in the evaluation results.

ERGONOMICS & RIDEABILITY EVALUATION

157 MILE RIDE

This portion evaluates the fuel efficiency and ergonomics of the motorcycle during extended field operations. It is designed to simulate the types of situations that an officer may encounter during an eight hour shift. Each motorcycle is driven four times through a 157 mile loop, one loop completed by each of the four EVOC riders. The loop covers 33 miles of city streets, 75 miles of California freeways, 20 miles of coastal highway, and 29 miles of mountain canyons. No attempt is made to "baby" the motorcycle through the loop, and hard acceleration starts are avoided.

During the ride-ability evaluation, a minimum of ten simulated traffic stops will be performed while on city streets. The rider will be required to properly position the motorcycle in a safe traffic enforcement position, dismount the motorcycle, pause for a minimum of two minutes per stop, remount the motorcycle, and accelerate into traffic.

The numerical results of the evaluation are recorded and then averaged between the four riders. This average is then recorded as the final result of this portion of the evaluation. Each rider will also submit a subjective evaluation of each motorcycle at the end of the ride.

The fuel efficiency evaluation is an attempt to estimate MPG (miles per gallon) based on actual riding conditions. It is the average gas usage of all four riders, for all four loops.

This subjective evaluation is a rating of human factors done individually and independently by all four riders. The ratings are averaged to minimize personal prejudices that individuals may have for or against any given motorcycle. This evaluation rates each motorcycle comparatively for its general suitability and efficiency for patrol operations.

HEAT EVALUATION

The heat evaluation is a "PASS-FAIL" scenario and is based on manufacturer's allowable operating temperatures.

Heat from each engine component is measured by means of a digital thermometer with a bi-metallic probe and infrared heat gun at the conclusion of the 32 high-speed laps. This process is accomplished in the following manner:

1. Transmission Fluid The probe is inserted into the transmission via the oil fill hole.
2. Engine Oil The probe is inserted into the engine case via the oil fill hole, if accessible.
3. Radiator Coolant Temperature is measured via the infrared heat gun aimed below the top radiator tank.

SOUND LEVEL EVALUATION

The sound level evaluation measures the sound levels of the motorcycle at different speeds. This evaluation is conducted at 40 mph, 60 mph, 80 mph, and while accelerating from 0 to 80 mph. The dB ratings are recorded with an EXTECH digital sound level meter. The sound level meter's microphone is mounted at the riders shoulder level, approximately 6 inches from his ear. During the fixed speed portion of the evaluation, the rider will accelerate to the identified speed, and after attaining that speed, will turn on the EXTECH meter and record the result. During the acceleration portion of the evaluation, the meter will be turned on, and the motorcycle will be accelerated to 80 mph. The meter will record the highest dB rating achieved during the entire acceleration of the motorcycle.

MOTORCYCLE SPECIFICATIONS

MOTORCYCLE SPECIFICATIONS

2014 HONDA POLICE MOTORCYCLE ST 1300-PA

Vehicle Description: Full size, Sport Touring, Police Package motorcycle
Engine Type: 1261cc liquid cooled 90 degree V-4
Bore and Stroke: 78mm x 66mm
Compression Ratio: 10.8:1
Valve Train: DOHC, 4 valves per cylinder
Carburetor / Fuel Injection: PGM-FI with automatic enricher circuit
Ignition: Computer Controlled digital with three dimensional mapping and electronic advance
Horsepower: 125 bhp @ 8000 rpm Torque: 85 ft-lb @ 6000 rpm
Final Drive (shaft, chain, belt): Shaft
Dry Weight: 679 lbs.
Alternator Output: 660 watt, high output
Battery: Odyssey P.C. 545 Gel Battery with 6 Amp Battery Charger
Transmission: Five speed
Clutch: 8 plate wet, hydraulic
Suspension:
Front: 45mm HMAS cartridge fork, 4.6 inches of travel
Rear: HMAS gas-charged single shock, 4.8 inches of travel
Brakes:
Front: Dual full floating 310mm floating front discs w/ABS
Rear: Single 316mm rear disc w/ABS
Tires: Fr - 120/70ZR-18 Rr - 170/60ZR-17
Wheels: 3 spoke U-section cast aluminum
Wheelbase: 58.7 inches
Rake: 26.0 degree
Trail: 98mm / 3.9 inches
Fuel Tank Capacity: 7.7 gallons
EPA Fuel Mileage:
Seat Height: 31.1 inches (+/- 0.6 inches)
Adjustments: 3 positions
Windscreen:
Adjustable / Fixed: Adjustable, electric, 7.4 inches & 13 degrees adjustability
Foot peg / Floorboard Position: Foot Peg
Saddlebag Storage Capacity: 35 liters each, side opening, detachable

MOTORCYCLE SPECIFICATIONS

2015 BMW POLICE MOTORCYCLE R1200 RT-P

Vehicle Description: Full size, Sport Touring, Police Package motorcycle
Engine Type: 1170cc air/oil cooled, 2 cylinders, Horizontally-Opposed
Bore and Stroke: 101mm x 73mm
Compression Ratio: 12.5:1
Valve Train: 4 valves per cylinder, Dual Overhead cam
Carburetor / Fuel Injection: Electronic fuel injection
Ignition: Electronic engine management BMS-X
Horsepower: 125hp Torque: 92ft/lb.
Final Drive (shaft, chain, belt): Shaft
Wet Weight: Approximately 650 lbs.
Alternator Output: 540 watt,
Battery: Two 12V 16ah AGM maintenance free batteries
Transmission: Constant Mesh 6 speed with helical cut gears
Clutch: 8 disc wet slipper, self-energizing clutch
Suspension:
Front: BMW Telelever, 4.7 inches of travel
Rear: BMW EVO paralever, 5.4 inches of travel
Brakes: BMW Motorrad Integral ABS system w/independent rear wheel control
Front: Hydraulically actuated twin disc radial 320mm diameter
Rear: Hydraulically actuated single disc, 276mm diameter
Tires: Fr - 120/70ZR-17 Rr - 180/55ZR-17
Wheels: Cast aluminum with side mounted inflation valves, tire pressure monitoring
Wheelbase: 58.4 inches Fork
Fork Angle: 63.4 degrees
Trail: 4.6 inches
Fuel Tank Capacity: 6.6 gallons with one gallon reserve
EPA Fuel Mileage: 60 hwy / 44 city
Seat Height: Std.: 31.7/32.5 Optional: High 32.7/33.5 Low 29.9/30.7
Adjustments: Yes, Three seat heights available
Windscreen: Yes
Adjustable / Fixed: Adjustable, electric
Foot peg / Floorboard Position: Foot Peg
Saddlebag Storage Capacity: 21 liters each, front hinged, top opening

MOTORCYCLE SPECIFICATIONS

2015 HARLEY-DAVIDSON ELECTRA SPECIAL

Vehicle Description: Full size, Sport Touring, Police Package motorcycle
Engine Type: 1690cc air/oil cooled, 2 cylinders (Stage 4 Street Performance engine kit)
Bore and Stroke: 3.875 x 4.375
Compression Ratio: 10.5:1
Valve Train: OHV, hydraulic self-adjusting lifters
Carburetor / Fuel Injection: Electronic Sequential port fuel injection
Ignition: Electronic
Horsepower: 103bhp Torque: 110ft-lb
Final Drive (shaft, chain, belt): Belt
Dry Weight: 791lbs
Alternator Output: 50amps
Battery: 12V / 28Ah, 405CCA, maintenance free
Transmission: 6-speed Cruise Drive Constant mesh
Clutch: Hydraulically actuated, wet, 9-plate
Suspension:
Front: Telescopic fork, 49mm
Rear: Swing arm with adjustable shocks
Brakes: Reflex™ Electronically linked brakes with ABS
Front: Hydraulic dual disc with floating rotors and 32mm 4 piston calipers
Rear: Hydraulic single disc with fixed rotor and 32mm 4 piston caliper
Tires: Fr – BW130/80B17 65H Rr – BW180/65B16 81H
Wheels: Impeller™ Cast aluminum
Wheelbase: 64"
Rake: 26 degrees
Trail: 6.7 inches
Fuel Tank Capacity: 6 gallons
EPA Fuel Mileage: N/A
Seat Height: 27.3" laden
Adjustments: Yes
Windscreen: Yes
Adjustable / Fixed: Fixed polycarbonate
Foot peg / Floorboard Position: Pivoting floorboards
Saddlebag Storage Capacity: Approximately 2000 cubic inches

MOTORCYCLE SPECIFICATIONS

2015 HARLEY-DAVIDSON ELECTRA GLIDE

Vehicle Description: Full size, Touring, Police Package motorcycle
Engine Type: 1690cc air/oil cooled, 2 cylinders
Bore and Stroke: 3.875 in. x 4.375 in.
Compression Ratio: 9.7: 1
Valve Train: Pushrod operated, overhead hydraulic self-adjusting lifters
Carburetor / Fuel Injection: Electronic Sequential Port Fuel Injection
Ignition: Electronic
Horsepower: N/A Torque : 104 ft-lb @ 3250 rpm
Final Drive (shaft, chain, belt): Drive belt
Dry Weight: 791lbs
Alternator Output: 50amps
Battery: 12V / 28Ah, 405CCA, maintenance free
Transmission: 6-speed Cruise Drive Constant mesh
Clutch: Hydraulically actuated, wet, 9-plate
Suspension,
Front: Telescopic fork, 49mm
Rear: Swing arm with adjustable shocks
Brakes: Reflex™ Electronically linked brakes with ABS
Front: Hydraulic dual disc with floating rotors and 32mm 4 piston calipers
Rear: Hydraulic single disc with fixed rotor and 32mm 4 piston caliper
Tires: Fr – BW130/80B17 65H Rr – BW180/65B16 81H
Wheels: Impeller™ Cast aluminum
Wheelbase: 64 inches
Rake: 26 degrees
Trail: 6.7 inches
Fuel Tank Capacity: 6 gallons
EPA Fuel Mileage: Combined City/HWY 42mpg
Seat Height: 27.3 in. laden
Adjustments: Yes
Windscreen: yes
Foot peg / Floorboard Position: Pivoting Floorboard
Saddlebag Storage Capacity: Approx. 2000 cubic inches

MOTORCYCLE SPECIFICATIONS

2015 HARLEY-DAVIDSON ROAD KING

Vehicle Description: Full size, Touring, Police Package motorcycle
Engine Type: 1690cc air/oil cooled, 2 cylinders
Bore and Stroke: 3.875 in. x 4.375 in.
Compression Ratio: 9.7: 1
Valve Train: Pushrod operated, overhead hydraulic self-adjusting lifters
Carburetor / Fuel Injection: Electronic Sequential Port Fuel Injection
Ignition: Electronic
Horsepower: N/A Torque : 104.7 ft-lb @ 3250 rpm
Final Drive (shaft, chain, belt): Drive belt
Dry Weight: 786lbs
Alternator Output: 50amps
Battery: 12V / 28Ah, 405CCA, maintenance free
Transmission: 6 speed Cruise Drive Constant mesh
Clutch: Cable actuated, wet, 9 plate
Suspension,
Front: 49mm telescopic
Rear: Swing arm with adjustable air shocks
Brakes: Reflex™ Electronically linked brakes with ABS
Front: Hydraulic dual disc with floating rotors and 32mm 4 piston calipers
Rear: Hydraulic single disc with fixed rotor and 32mm 4 piston caliper
Tires: Fr – BW130/80B17 65H Rr – BW180/65B16 81H
Wheels: Impeller™ Cast aluminum
Wheelbase: 64 inches
Rake: 26 degrees
Fork Angle 29.25 degrees
Trail: 6.7 inches
Fuel Tank Capacity: 6 gallons
EPA Fuel Mileage: Combined City/HWY 42mpg
Seat Height: 27.3 in. laden
Adjustments: Yes
Windscreen: Fixed detachable Polycarbonate
Foot peg / Floorboard Position: Pivoting Floorboard
Saddlebag Storage Capacity: Approx. 2000 cubic inches

MOTORCYCLE SPECIFICATIONS

2015 VICTORY COMMANDER 1

Vehicle Description: Full size, Touring, Police Package motorcycle
Engine Type: 1731cc air/oil cooled, 2 cylinders V-Twin Overhead Cam
Bore and Stroke: 101mm x 108mm
Compression Ratio: 9.4:1
Valve Train: Overhead Cams, 4 valves per cylinder
Carburetor / Fuel Injection: Electronic fuel injection /dual 45mm throttle body
Ignition: Electronic
Horsepower: 97
Torque: 113 ft-lb @ 2,700 rpm
Final Drive (shaft, chain, belt): Carbon fiber reinforced belt
Dry Weight: 855lbs
Alternator Output: 50 amp
Battery: 18 amp/hour, 12 volt, 270cca
Transmission: 6speed
Clutch: Wet, Multi-plate
Suspension,
Front: 46mm male-slider fork, adjustable preload and rebound damping, 5.1 inches trav
Rear: Link mono air adjustable shock. Travel-4.7 inch
Brakes: Independent ABS
Front: Dual 300mm floating rotors w/4-piston calipers
Rear: Single 300mm floating rotor w/2-piston calipers
Tires: Fr – Dunlop Elite 3 130/70R18 Rr – Dunlop Elite 3 180/60R16
Wheels: Cast aluminum rims
Wheelbase: 65.7 inches
Rake: 29.0 degrees
Trail: 5.6 inches
Fuel Tank Capacity: 5.8 gallons
EPA Fuel Mileage: 47mpg hwy, 42mpg city, 44.5mpg combined
Seat Height: 26.25 inches
Adjustments: Yes
Windscreen: Yes
Adjustable / Fixed: Electric Adjustable
Foot Peg / Floorboard Position: Floor boards
Saddlebag Storage Capacity: 21 gallon w/ 560lbs of load capacity

MOTORCYCLE SPECIFICATIONS

2015 ZERO ELECTRIC DSP

Vehicle Description: 100% Electric Dual Sport Police Motorcycle
Engine Type: Passively air-cooled, radial flux permanent magnet, brushless motor
Bore and Stroke: N/A
Compression Ratio: N/A
Valve Train: N/A
Carburetor / Fuel Injection: N/A
Ignition: N/A
Horsepower: 54hp (40kw) @ 4,300RPM
Torque: 68ft-lb
Final Drive (shaft, chain, belt): Belt, Poly Chain GT® carbon Belt
Dry Weight: 428lbs
Alternator Output: N/A
Battery: 11.4 k Wh Z-Force® Li-Ion Intelligent
Transmission: Clutchless Direct Drive
Clutch: N/A
Suspension,
Front: 43mm inverted forks with adjustable compression and rebound dampening
Rear: Piggy-back reservoir shock with adjustable spring pre-load, compression and rebound
Brakes:
Front: Nissan 2 piston hydraulic, 313x4mm floating disc
Rear: J-Juan 1 piston hydraulic, 240x4.5mm disc
Tires: Fr – 100/90-19 Rr – 13/80-17
Wheels: Cast aluminum rims
Wheelbase: 56.2 inches
Rake: 26.5 degrees
Trail: 4.6 inches
Fuel Tank Capacity: N/A
EPA Fuel Mileage: 239 MPGe combined @ 70mph
Seat Height: 33.3”
Adjustments: No
Windscreen: Yes
Adjustable / Fixed: Optional adjustable
Foot Peg / Floorboard Position: Foot peg
Saddlebag Storage Capacity: 42 liters

MOTORCYCLE SPECIFICATIONS

2015 MOTO GUZZI NORGE

Vehicle Description: Full size, Touring, Police Package motorcycle
Engine Type: 90 degree V-twin 1.151cc, 4-stroke, air cooled
Bore and Stroke: 95 x 81.2 mm (3.74 x 3.20 inches)
Compression Ratio: 10.8:1
Valve Train: Single overhead camshaft with roller tappets and valve rockers, 4 valves per cylinder.
Carburetor / Fuel Injection: Electronic injection (Weber Marelli) with stepper motor.
Ignition: Electronic
Horsepower: 102
Torque: 76.7 ft-lb @5500 rpm
Final Drive (shaft, chain, belt): shaft
Dry Weight: 566 lbs.
Alternator Output: 12v – 550w
Battery: 12v – 18ah
Transmission: 6-speed
Clutch: Hydraulically controlled single plate dry clutch with incorporated flex coupling.
Suspension,
Front: Telescopic hydraulic fork with 45mm stanchions and adjustable spring preload.
Rear: Single arm with progressive linkage and mono-shock with adjustable rebound.
Brakes: Hydraulic w/ABS
Front: Dual 320mm stainless steel floating discs, Brembo calipers with 4 pistons.
Rear: 282mm stainless steel fixed disc, Brembo floating caliper with 2 pistons.
Tires: Fr- 120/70 ZR17 Rr- 180/55 ZR17
Wheels: Hollow 3-spoke rim in chilled cast aluminum alloy.
Wheelbase: 1.495m Rake: 25.0 degrees Trail: 4.72 in (120mm)
Fuel Tank Capacity: 6 gallons
EPA Fuel Mileage: Not yet rated
Seat Height: 31.8”
Adjustments: No
Windscreen: Yes
Adjustable / Fixed: Adjustable
Foot Peg / Floorboard Position: Foot peg.
Saddlebag Storage Capacity: 36L

MOTORCYCLE SPECIFICATIONS

MOTO GUZZI CALIFORNIA 1400

Vehicle Description: Full size, Touring, Police Package motorcycle		
Engine Type: 90 degree V-twin, 4-stroke, 4 valve, twin spark.		
Bore and Stroke: 4.09 x 3.20 in (104 x 81.2mm)		
Compression Ratio: 10.5:1		
Valve Train: Single overhead camshaft with roller tappets and valve control rockers, 4 valves per cylinder		
Carburetor / Fuel Injection: Electronic injection (Weber Mirelli)		
Ignition: Electronic		
Horsepower: 96		
Torque: 87 ft-lb @2750 rpm		
Final Drive (shaft, chain, belt): Shaft		
Dry Weight: 709.8 lbs.		
Alternator Output: 12v – 550w		
Battery: 12v – 18ah		
Transmission: 6-speed		
Clutch: Hydraulically controlled single plate dry clutch with incorporated flex coupling.		
Suspension,		
Front: 46mm traditional fork		
Rear: Swing arm with 2 shock absorbers with adjustable spring pre-load.		
Brakes: Hydraulic w/ABS		
Front: Dual 320mm stainless steel floating discs, Brembo radial calipers with 4 pistons.		
Rear: 282mm stainless steel fixed disc, Brembo floating caliper with 2 pistons.		
Tires: Fr- 130/70R18 Rr- 200/60R16		
Wheels: Alloy		
Wheelbase: 66.34 in (1685mm)	Rake: 32 deg.	Trail: 6.10 in (155mm)
Fuel Tank Capacity: 5.4 gallons		
EPA Fuel Mileage: Not yet rated		
Seat Height: 29.1” (28.3” optional)		
Adjustments: No		
Windscreen: Yes		
Adjustable / Fixed:		
Foot Peg / Floorboard Position:		
Saddlebag Storage Capacity: 35L		

BASIC MOTORCYCLE PATTERNS

BASIC MOTORCYCLE PATTERNS

2015 HARLEY-DAVIDSON ELECTRA GLIDE SPECIAL					
PATTERN	20 FT.	19 FT.	18 FT.	17 FT.	16 FT.
Circle	P	P	P	P	F
U-Turn	P	P	P	P	P
PATTERN	11 FT.	10 ½ FT.	10 FT.	9 ½ FT.	
Short Cone Weave	P	P	P	P	
PATTERN		CONSIDERATION			RATING**
30 MPH Cone Weave		Counter steering effort / Bike Drag			4

** Rating Scale - Pass or Fail

2015 HARLEY-DAVIDSON ELECTRA GLIDE					
PATTERN	20 FT.	19 FT.	18 FT.	17 FT.	16 FT.
Circle	P	P	P	P	F
U-Turn	P	P	P	P	P
PATTERN	11 FT.	10 ½ FT.	10 FT.	9 ½ FT.	
Short Cone Weave	P	P	P	P	
PATTERN		CONSIDERATION			RATING**
30 MPH Cone Weave		Counter steering effort / Bike Drag			4

** Rating Scale - Pass or Fail

2015 HARLEY-DAVIDSON ROAD KING					
PATTER	20 FT.	19 FT.	18 FT.	17 FT.	16 FT.
Circle	P	P	P	P	P
U-Turn	P	P	P	P	F
PATTERN	11 FT.	10 ½ FT.	10 FT.	9 ½ FT.	
Short Cone Weave	P	P	P	P	
PATTERN		CONSIDERATION			RATING**
30 MPH Cone Weave		Counter steering effort / Bike Drag			4

** Rating Scale – Pass or Fail

BASIC MOTORCYCLE PATTERNS

2014 HONDA ST1300P					
PATTER	20 FT.	19 FT.	18 FT.	17 FT.	16 FT.
Circle	P	P	P	P	F
U-Turn	P	P	P	P	P
PATTERN	11 FT.	10 ½ FT.	10 FT.	9 ½ FT.	
Short Cone Weave	P	P	P	P	
PATTERN	CONSIDERATION			RATING**	
30 MPH Cone Weave	Counter steering effort / Bike Drag			4	

** Rating Scale – Pass or Fail

2015 BMW R1200RT-P					
PATTER	20 FT.	19 FT.	18 FT.	17 FT.	16 FT.
Circle	P	P	P	P	P
U-Turn	P	P	P	P	P
PATTERN	11 FT.	10 ½ FT.	10 FT.	9 ½ FT.	
Short Cone Weave	P	P	P	P	
PATTERN	CONSIDERATION			RATING**	
30 MPH Cone Weave	Counter steering effort / Bike Drag			5	

** Rating Scale – Pass or Fail

2015 VICTORY COMMANDER 1					
PATTER	20 FT.	19 FT.	18 FT.	17 FT.	16 FT.
Circle	P	F	F	F	F
U-Turn	P	P	P	P	F
PATTERN	11 FT.	10 ½ FT.	10 FT.	9 ½ FT.	
Short Cone Weave	P	P	F	F	
PATTERN	CONSIDERATION			RATING**	
30 MPH Cone Weave	Counter steering effort / Bike Drag			3	

** Rating Scale – Pass or Fail

BASIC MOTORCYCLE PATTERNS

2015 ZERO ELECTRIC DSP					
PATTER	20 FT.	19 FT.	18 FT.	17 FT.	16 FT.
Circle	P	P	P	F	
U-Turn	P	P	P	P	P
PATTERN	11 FT.	10 ½ FT.	10 FT.	9 ½ FT.	
Short Cone Weave	P	P	P	P	P
PATTERN		CONSIDERATION			RATING**
30 MPH Cone Weave		Counter steering effort / Bike Drag			4

** Rating Scale - Pass or Fail

2015 MOTO GUZZI NORGE					
PATTER	20 FT.	19 FT.	18 FT.	17 FT.	16 FT.
Circle	P	P	P	P	F
U-Turn	P	P	P	P	P
PATTERN	11 FT.	10 ½ FT.	10 FT.	9 ½ FT.	
Short Cone Weave	P	P	P	P	F
PATTERN		CONSIDERATION			RATING**
30 MPH Cone Weave		Counter steering effort / Bike Drag			4

** Rating Scale - Pass or Fail

2015 MOTO GUZZI CALIFORNIA 1400					
PATTER	20 FT.	19 FT.	18 FT.	17 FT.	16 FT.
Circle	P	P	F		
U-Turn	P	P	P	P	P
PATTERN	11 FT.	10 ½ FT.	10 FT.	9 ½ FT.	
Short Cone Weave	P	F	F	F	F
PATTERN		CONSIDERATION			RATING**
30 MPH Cone Weave		Counter steering effort / Bike Drag			3

** Rating Scale – Pass or Fail

**32 LAP HIGH-SPEED COURSE
MOTORCYCLE DYNAMICS
EVALUATION**

32 LAP HIGH-SPEED COURSE MOTORCYCLE DYNAMICS EVALUATION

2014 HONDA ST1300P

RIDER	LAPS	AVG. TIME	AVG. SPEED
Deputy J. Houle	1 thru 8	01:26.76	60.4
Officer V. Medrano	9 thru 16	01:31.10	57.4
Deputy H. Renteria	17 thru 23	01:32.11	56.8
Officer M. Nowlen	24 thru 32	01:24.11	62.0

ITEM	RATING**
STEERING	7.7
LEAN ANGLE	8.5
SUSPENSION	8.7
BRAKE FADE	9.5
BRAKE PULL	8.2
ABS OPERATION	9.0

**Rating Scale 1 – 10 / 1 -Poor / 5 – Average / 10 - Outstanding

RIDER COMMENTS

Brakes: Brake fade was noted near the end of the first 8 laps, otherwise braking was noted to be consistent, responsive and predictable. The brakes were stable under hard braking conditions.

Cornering/Handling: Finding the line during cornering was easy. There was a quick response to the initial input to counter steer. This bike runs out of lean angle limiting the turning radius. Rear wheel slipped on a few of the corners.

Transmission (Shift Points): Gear shifting is smooth and easy for both up and down shifting. Good gear ratio matches with engine.

Engine: The engine produces excellent torque and speed. This vehicle pulls hard from 6000 RPM to redline.

Other: Rear tires broke traction on cornering.

32 LAP HIGH-SPEED COURSE
MOTORCYCLE DYNAMICS EVALUATION

2015 HARLEY-DAVIDSON ELECTRA GLIDE

RIDER	LAPS	AVG. TIME	AVG. SPEED
Deputy J. Houle	1 thru 8	01:33.97	55.8
Officer V. Medrano	9 thru 16	01:35.66	54.9
Deputy S. Bryant	17 thru 23	01:34.90	55.5
Officer M. Nowlen	24 thru 32	01:30.83	57.6

ITEM	RATING**
STEERING	8.0
LEAN ANGLE	7.2
SUSPENSION	7.7
BRAKE FADE	9.1
BRAKE PULL	9.2
ABS OPERATION	9.5

**Rating Scale 1 – 10 / 1 -Poor / 5 – Average / 10 - Outstanding

RIDER COMMENTS
<p>Brakes: Brakes grab hard and stop the bike quickly. Braking is predictable giving the rider confidence of stopping a big bike in a short distance.</p> <p>Cornering/Handling: The bike handles better than in previous years. Lean is limited by the running boards. Counter steering is good and the bike remains stable when cornering.</p> <p>Transmission (Shift Points): This bike has good solid shifting characteristics. The engine and drive train are well matched.</p> <p>Engine: The bike pulls strong to redline with lots of low end torque and strong roll on.</p>

32 LAP HIGH-SPEED COURSE
MOTORCYCLE DYNAMICS EVALUATION

2015 HARLEY-DAVIDSON ROAD KING

RIDER	LAPS	AVG. TIME	AVG. SPEED
Deputy J. Houle	1 thru 8	01:33.59	56.3
Officer V. Medrano	9 thru 16	01:36.76	54.4
Deputy S. Bryant	17 thru 23	01:35.08	55.4
Officer M. Nowlen	24 thru 32	01:29.86	58.3

ITEM	RATING**
STEERING	7.2
LEAN ANGLE	6.0
SUSPENSION	7.1
BRAKE FADE	9.5
BRAKE PULL	9.5
ABS OPERATION	9.7

**Rating Scale 1 – 10 / 1 -Poor / 5 – Average / 10 - Outstanding

RIDER COMMENTS

Brakes: The brakes were firm and predictable. The ABS was smooth and there was no fade noted.

Cornering/Handling: Lean angle is limited due to the floor boards scraping the ground during cornering. Quick reaction to counter steer was noted. The bike tracks well through the turns.

Transmission (Shift Points): The transmission shifts smoothly with no missed shifts.

Engine: The engine puts out moderate power. Low end torque is excellent, but top end power is lacking.

32 LAP HIGH-SPEED COURSE
MOTORCYCLE DYNAMICS EVALUATION

2015 HARLEY-DAVIDSON ELECTRA SPEC.

RIDER	LAPS	AVG. TIME	AVG. SPEED
Deputy J. Houle	1 thru 8	01:33.73	56.0
Officer V. Medrano	9 thru 16	01:34.55	55.3
Deputy S. Bryant	17 thru 23	01:35.73	55.0
Officer M. Nowlen	24 thru 32	01:30.81	57.6

ITEM	RATING**
STEERING	8.0
LEAN ANGLE	7.0
SUSPENSION	7.7
BRAKE FADE	9.4
BRAKE PULL	9.5
ABS OPERATION	9.7

**Rating Scale 1 – 10 / 1 -Poor / 5 – Average / 10 – Outstanding

RIDER COMMENTS

Brakes: Brake performance is excellent with great stopping distance and excellent feedback to the rider. The ABS was noted by one rider to be slightly jerky.

Cornering/Handling: Cornering is limited due to the floor boards. Riders were able to maintain a stable line throughout the cornering. Good initial counter steer.

Transmission (Shift Points): The transmission shifts smoothly. The gearing provides for great power through the power bands.

Engine: This bike is strong. It pulls hard all the way to redline. Good acceleration, power and torque.

Other: This bike should be the standard police version.

32 LAP HIGH-SPEED COURSE MOTORCYCLE DYNAMICS EVALUATION

2015 BMW R1200RT-P

RIDER	LAPS	AVG. TIME	AVG. SPEED
Deputy J. Houle	1 thru 8	01:23.77	62.5
Officer V. Madrano	9 thru 16	01:26.48	60.5
Deputy H. Renteria	17 thru 23	01:28.75	58.6
Officer M. Nowlen	24 thru 32	01:22.36	63.4

ITEM	RATING**
STEERING	10.0
LEAN ANGLE	10.0
SUSPENSION	10.0
BRAKE FADE	9.7
BRAKE PULL	9.5
ABS OPERATION	10.0

**Rating Scale 1 – 10 / 1 -Poor / 5 – Average / 10 - Outstanding

RIDER COMMENTS

Brakes: Brakes felt soft at the handle but stopping power was excellent. There was no brake fade noted. ABS operation was smooth and stopping distance was consistent.

Cornering/Handling: Cornering was tight and smooth, excellent lean angle. The rear tire did break loose slightly on a few corners. The bike remained stable throughout cornering.

Transmission (Shift Points): The bike had lots of torque and power throughout all of the gears. Gear ratio is very well matched to the engine output.

Engine: This engine is very powerful all the way to redline, very responsive.

32 LAP HIGH-SPEED COURSE MOTORCYCLE DYNAMICS EVALUATION

2015 VICTORY COMMANDER 1

RIDER	LAPS	AVG. TIME	AVG. SPEED
Deputy J. Houle	1 thru 8	01:37.56	53.3
Officer V. Madrano	9 thru 16	01:39.87	52.2
Deputy H. Renteria	17 thru 23	01:37.43	53.8
Officer M. Nowlen	24 thru 32	01:32.32	56.4

ITEM	RATING**
STEERING	6.5
LEAN ANGLE	5.2
SUSPENSION	6.7
BRAKE FADE	7.1
BRAKE PULL	7.5
ABS OPERATION	8.3

**Rating Scale 1 – 10 / 1 -Poor / 5 – Average / 10 - Outstanding

RIDER COMMENTS
<p>Brakes: The brakes were slow to respond and spongy. There was a slight fade and inconsistent stopping distances. One rider noticed excellent stopping power for a larger bike.</p> <p>Cornering/Handling: Cornering and handling were directly affected by the floor boards scraping. It runs out of angle very quickly and is not forgiving.</p> <p>Transmission (Shift Points): Shifting is smooth, but power is lagging. The shift lever and the heel shift are hard to find at times. The gearing is appropriate for the power available.</p> <p>Engine: Great low end torque, and pulls well through the gears. More horsepower is needed for police work.</p> <p>Other: Tachometer lag, gear position indicator not reading shifts quickly.</p>

32 LAP HIGH-SPEED COURSE MOTORCYCLE DYNAMICS EVALUATION

2015 ZERO ELECTRIC DSP

RIDER	LAPS	AVG. TIME	AVG. SPEED
Deputy J. Houle	1 thru 8	01:35.76	54.5
Officer V. Madrano	9 thru 16	01:35.76	54.4
Deputy H. Renteria	17 thru 23	01:34.64	55.1
	24 thru 32		

ITEM	RATING**
STEERING	8.2
LEAN ANGLE	9.0
SUSPENSION	8.2
BRAKE FADE	7.7
BRAKE PULL	8.2
ABS OPERATION	N/A

**Rating Scale 1 – 10 / 1 -Poor / 5 – Average / 10 - Outstanding

RIDER COMMENTS

Brakes: Good stopping power and brake pull. Rider feedback through the controls was good. The only thing missing is ABS.

Cornering/Handling: This bike was easy to handle and had good lean angle and able to keep a good line through corners.

Transmission (Shift Points): N/A

Engine: This bike produced smooth consistent, linear power.

32 LAP HIGH-SPEED COURSE MOTORCYCLE DYNAMICS EVALUATION

2015 MOTO GUZZI NORGE

RIDER	LAPS	AVG. TIME	AVG. SPEED
Deputy S. Bryant	1 thru 8	01:25.91	60.7
Officer R. Stewart	9 thru 16	01:26.79	60.1
Deputy J. Houle	17 thru 23	01:30.59	57.4
Officer M. Nowlen	24 thru 32	01:25.58	61.0

ITEM	RATING**
STEERING	9.3
LEAN ANGLE	9.7
SUSPENSION	8.3
BRAKE FADE	10
BRAKE PULL	9.7
ABS OPERATION	10

**Rating Scale 1 – 10 / 1 -Poor / 5 – Average / 10 – Outstanding

RIDERS COMMENTS

Brakes: The brakes on this bike were very strong allowing for excellent stopping power. The ABS was smooth and stable, there was no brake fade.

Cornering/handling: The foot pegs and lower fairing scrape while cornering however lean angle was good and the bike had tight cornering ability.

Transmission (Shift Points): The gear ratios on this bike are very close causing excessive shifting. The transmission shifts smoothly and there is good power throughout all the gears.

Engine: The bike was sluggish at the start, but midrange and top end power were adequate.

Other: This review based on 3 reviews as the third rider fell off on the sixth lap.

32 LAP HIGH-SPEED COURSE
MOTORCYCLE DYNAMICS EVALUATION

2015 MOTO GUZZI CALIFORNIA 1400

RIDER	LAPS	AVG. TIME	AVG. SPEED
Deputy J. Houle	1 thru 8	01:36.01	54.5
Officer V. Madrano	9 thru 16	01:35.35	53.2
Deputy H. Renteria	17 thru 23	01:35.15	55.3
Officer M. Nowlen	24 thru 32	01:31.22	57.3

ITEM	RATING**
STEERING	7.6
LEAN ANGLE	6.2
SUSPENSION	8.0
BRAKE FADE	9.2
BRAKE PULL	9.0
ABS OPERATION	9.1

**Rating Scale 1 – 10 / 1 -Poor / 5 – Average / 10 - Outstanding

RIDER COMMENTS
<p>Brakes: This bike stops quickly with no brake fade and smooth ABS. Stopping distance was consistent.</p> <p>Cornering/Handling: Lean angle was limited due to floor boards or frame scraping. The bike is stable in turns and holds a line well when negotiating bumps in the turn.</p> <p>Transmission (Shift Points): The transmission gearing was well matched to the engine power, resulting in plenty of torque. The transmission shifted smoothly. It did disengage from the gear twice at high speeds as noted by one rider.</p> <p>Engine: The engine pulls strong even at low RPM.</p> <p>Other: Tachometer lags. Plastic skids on foot boards are helpful.</p>

PURSUIT COURSE
MOTORCYCLE DYNAMICS
EVALUATION

PURSUIT COURSE
MOTORCYCLE DYNAMICS
EVALUATION

2014 HONDA ST1300P

DRIVERS	TOTAL TIME	AIR /TRACK	SPEED
Deputy J. Houle, LASD	4:18.88	63° F / 74° F	36.1
Deputy M. Nowlen, LASD	4:25.53	63° F / 74° F	35.3
Average Time	4:22.20	Average Speed	35.7

ITEM	RATING*
STEERING	7.5
LEAN ANGLE	7.5
SUSPENSION	8.0
BRAKE FADE	9.0
BRAKE PULL	8.0
ABS OPERATION	8.0

**Rating Scale 1 – 10 / 1 -Poor / 5 – Average / 10 - Outstanding

DRIVER COMMENTS

Brakes – The bike is hard to stop at high speeds when setting up for tight turns. Stopping distance seems long compared to applied pressure.

Cornering/Handling – Side to side transition is very heavy. The lean angle is shallow causing pegs to scrape and making negotiation of tight corners difficult. The front suspension is sloppy.

Transmission (Shift Points) – The transmission is well matched for the power output of the engine. There were no missed shifts. Low end torque causes rear tire kick out.

Engine – Great power. Strong torque out of the corners.

PURSUIT COURSE
MOTORCYCLE DYNAMICS
EVALUATION

2015 BMW R1200RT-P

DRIVERS	TOTAL TIME	AIR /TRACK	SPEED
Deputy J. Houle, LASD	4:15.84	63° F / 74° F	35.6
Deputy M. Nowlen, LASD	4:25.53	63° F / 74° F	35.3
Average Time	4:20.68	Average Speed	35.4

ITEM	RATING*
STEERING	9.5
LEAN ANGLE	10.0
SUSPENSION	10.0
BRAKE FADE	10.0
BRAKE PULL	10.0
ABS OPERATION	10.0

**Rating Scale 1 – 10 / 1 -Poor / 5 – Average / 10 - Outstanding

DRIVER COMMENTS
<p>Brakes – Brakes come on strong with no fade noted. The bike remains stable when hard braking situations are encountered. The brakes are outstanding and cause the bike to stop quickly.</p> <p>Cornering/Handling – The bike has great lean angle and easy transition side to side. Cornering in easy and the bike held lines well.</p> <p>Transmission (Shift Points) – The shift assist is awesome. Gear ratios allowed for good power coming out of corners and turns.</p> <p>Engine – The bike produced fantastic power throughout the course. It pulls very strong from low RPM to redline.</p>

PURSUIT COURSE
MOTORCYCLE DYNAMICS
EVALUATION

2015 VICTORY COMMANDER 1

DRIVERS	TOTAL TIME	AIR /TRACK	SPEED
Deputy J. Houle, LASD	4:45.46	70° F / 84° F	32.8
Deputy M. Nowlen, LASD	4:33.95	70° F / 82° F	35.3
Average Time	4:39.70	Average Speed	34.1

ITEM	RATING*
STEERING	7.5
LEAN ANGLE	6.0
SUSPENSION	8.0
BRAKE FADE	5.5
BRAKE PULL	6.0
ABS OPERATION	6.0

**Rating Scale 1 – 10 / 1 -Poor / 5 – Average / 10 - Outstanding

DRIVER COMMENTS
<p>Brakes – The brakes on this bike faded when they heated up, causing a loss of efficiency and inconsistent stopping distances.</p> <p>Cornering/Handling – The bike has a very limited lean angle causing the rider to hesitate when cornering, and limits maneuverability.</p> <p>Transmission (Shift Points) – The power to gear ratio is well matched. There was two instances during this testing of missed shifts into neutral. The clutch and transmission seem slow to react during maximum power input.</p> <p>Engine – The engine provided plenty of power even at low end allowing for good pull out of the turns.</p>

PURSUIT COURSE
MOTORCYCLE DYNAMICS
EVALUATION

2015 HARLEY FLHP ROAD KING

DRIVERS	TOTAL TIME	AIR /TRACK	SPEED
Deputy S. Bryant, LASD	4:45.65	70° F / 76° F	32.7
Officer M. Nowlen, LAPD	4:46.12	69° F / 78° F	32.7
Average Time	4:45.88	Average Speed	32.7

ITEM	RATING*
STEERING	8.5
LEAN ANGLE	7.0
SUSPENSION	8.5
BRAKE FADE	9.0
BRAKE PULL	9.0
ABS OPERATION	8.5

**Rating Scale 1 – 10 / 1 -Poor / 5 – Average / 10 – Outstanding

DRIVER COMMENTS
<p>Brakes – No fade noted with the brakes. The ABS works well except for a slight pulsing with the activation of the ABS.</p> <p>Cornering/Handling – The floor boards limit the lean angle of this bike.</p> <p>Transmission (Shift Points) – The transmission is well paired with the output of the engine.</p> <p>Engine – The engine produces good power at low speeds.</p>

PURSUIT COURSE
MOTORCYCLE DYNAMICS
EVALUATION

2015 HARLEY FLHTP ELECTRA GLIDE

DRIVERS	TOTAL TIME	AIR /TRACK	SPEED
Officer M. Nowlen, LAPD	4:36.43	70° F / 82° F	33.9
Deputy J. Houle, LASD	4:42.29	70° F / 84° F	33.2
Average Time	4:39.36	Average Speed	33.5

ITEM	RATING*
STEERING	8.5
LEAN ANGLE	7.5
SUSPENSION	7.5
BRAKE FADE	10.0
BRAKE PULL	10.0
ABS OPERATION	10.0

**Rating Scale 1 – 10 / 1 -Poor / 5 – Average / 10 - Outstanding

DRIVER COMMENTS

Brakes – The brakes stop this bike in excellent fashion at high speeds. Response to application is quick with great feedback. The bike is stable and predictable under hard braking conditions.

Cornering/Handling – The bike has limited lean angle due to the bottom bracket of the floor boards scraping.

Transmission (Shift Points) – The transmission has great gear ratio for the power and RPM range.

Engine – The engine produces good low RPM power but it is weaker at high RPM.

PURSUIT COURSE
MOTORCYCLE DYNAMICS
EVALUATION

2015 HARLEY FLHTP ELECTRA (SPECIAL)

DRIVERS	TOTAL TIME	AIR /TRACK	SPEED
Deputy S. Bryant, LASD	4:43.50	70° F / 81° F	33.1
Officer M. Nowlen, LAPD	4:35.55	71° F / 89° F	34.0
Average Time	4:39.52	Average Speed	33.5

ITEM	RATING*
STEERING	7.7
LEAN ANGLE	7.0
SUSPENSION	7.7
BRAKE FADE	9.0
BRAKE PULL	9.5
ABS OPERATION	9.2

**Rating Scale 1 – 10 / 1 -Poor / 5 – Average / 10 - Outstanding

DRIVER COMMENTS
<p>Brakes – The brakes are consistent, very stable under maximum braking conditions. The ABS is a little jerky.</p> <p>Cornering/Handling – This bike allows for quick side to side transitions, but lean angle is limited due to the floor boards.</p> <p>Transmission (Shift Points) – The gearing is matched well with the power output of the engine. Shifting is easy. No miss shifts were encountered.</p> <p>Engine – This bike has a strong engine that pulls hard all the way through to redline.</p>

PURSUIT COURSE
MOTORCYCLE DYNAMICS
EVALUATION

2015 MOTO GUZZI NORGE

DRIVERS	TOTAL TIME	AIR /TRACK	SPEED
Deputy S. Bryant, LASD	4:49.10	69° F / 78° F	32.4
Officer V. Madrano, LAPD	DNF	70° F / 76° F	
Average Time	4:49.10	Average Speed	32.4

ITEM	RATING*
STEERING	8.5
LEAN ANGLE	9.5
SUSPENSION	8.0
BRAKE FADE	9.5
BRAKE PULL	9.5
ABS OPERATION	9.5

**Rating Scale 1 – 10 / 1 -Poor / 5 – Average / 10 - Outstanding

DRIVER COMMENTS

Brakes – The brakes on this bike were firm, no fade, good stopping power.

Cornering/Handling – This bike handles corners well without dragging. The short wheelbase allows for great handling.

Transmission (Shift Points) – The transmission on this bike shifts smoothly.

Engine – The engine produces lots of torque, with good midrange power.

PURSUIT COURSE
MOTORCYCLE DYNAMICS
EVALUATION

2015 MOTO GUZZI CALIFORNIA 1400

DRIVERS	TOTAL TIME	AIR /TRACK	SPEED
Deputy S. Bryant, LASD	4:36.30	70° F / 81° F	33.9
Officer M. Nowlen, LAPD	4:35.22	71° F / 87° F	34.0
Average Time	4:35.26	Average Speed	33.9

ITEM	RATING*
STEERING	6.0
LEAN ANGLE	6.0
SUSPENSION	7.0
BRAKE FADE	NONE
BRAKE PULL	9.0
ABS OPERATION	10.0

**Rating Scale 1 – 10 / 1 -Poor / 5 – Average / 10 - Outstanding

DRIVER COMMENTS

Brakes – The brakes on this bike provide excellent feedback through the controls. There is no brake fade. The brakes are very responsive to the applied pressure.

Cornering/Handling – This bike has a shallow unforgiving lean angle. The frame contact with the roadway upsets the overall stability in the tight street course.

Transmission (Shift Points) – The engine and transmission are well matched, with good solid shifts. The dry clutch limits quick starts.

Engine – The engine produces great power band and good power out of the corners. The engine pulls hard.

PURSUIT COURSE
MOTORCYCLE DYNAMICS
EVALUATION

2015 ZERO ELECTRIC DSP

DRIVERS	TOTAL TIME	AIR /TRACK	SPEED
Deputy S. Bryant, LASD	4:54.85	75° F / 95° F	31.7
Deputy J. Houle, LASD	4:39.29	73° F / 94° F	33.5
Average Time	4:47.07	Average Speed	32.6

ITEM	RATING*
STEERING	9.0
LEAN ANGLE	9.5
SUSPENSION	8.2
BRAKE FADE	8.5
BRAKE PULL	8.5
ABS OPERATION	N/A

**Rating Scale 1 – 10 / 1 -Poor / 5 – Average / 10 - Outstanding

DRIVER COMMENTS
<p>Brakes – The brakes are firm with no fade noted. ABS would be a plus on this bike.</p> <p>Cornering/Handling – The front suspension compresses with hard braking causing the rear tire to become light. The battery weight made the bike feel a little unbalanced through the cone weave patterns.</p> <p>Transmission (Shift Points) – NONE</p> <p>Engine – This bike is slow off the line but produces good green power.</p>

BRAKING

HARD BRAKING
PANIC STOP – 60 MPH TO ZERO

2014 HONDA ST1300P	
RIDER	STOPPING DISTANCE
Dep. J Houle	143.4 @ 60MPH

2015 HARLEY DAVIDSON ELECTRA GLIDE	
RIDER	STOPPING DISTANCE
Dep. J Houle	155.1 @ 60 MPH

2015 HARLEY DAVIDSON ROAD KING	
RIDER	STOPPING DISTANCE
Ofc. M. Nowlen	152.6 @ 60 MPH

2015 MOTO GUZZI CALIFORNIA 1400	
RIDER	STOPPING DISTANCE
Ofc. M. Nowlen	143.1 @ 60 MPH

2015 BMW R1200RT-P	
RIDER	STOPPING DISTANCE
Ofc. M. Nowlen	130.6 @ 60 MPH

2015 VICTORY COMMANDER 1	
RIDER	STOPPING DISTANCE
Dep. J Houle	170.2 @ 60 MPH

2015 ZERO ELECTRIC DSP	
RIDER	STOPPING DISTANCE
Dep. J Houle	211.0 @ 60 MPH

2015 MOTO GUZZI NORGE	
RIDER	STOPPING DISTANCE
Ofc. M. Nowlen	138.1 @ 60 MPH

DEBRIS FIELD BRAKING
SANDY SURFACE – 40 MPH TO ZERO

2015 HONDA ST1300P	
RIDER	STOPPING DISTANCE
Dep. J Houle	120.2 @ 40 MPH

2015 HARLEY-DAVIDSON ELECTRA GLIDE	
RIDER	STOPPING DISTANCE
Dep. J. Houle	115.4 @ 40 MPH

2015 HARLEY-DAVIDSON ROAD KING	
RIDER	STOPPING DISTANCE
Ofc. M. Nowlen	NO ABS

2015 BMW R1200RT-P	
RIDER	STOPPING DISTANCE
Dep. J Houle	77.0 @ 40

2015 HARLEY DAVINDSON ELECTRA GLIDE SPEC.	
RIDER	STOPPING DISTANCE
Dep. J Houle	90.7 @ 40

2015 VICTORY COMMANDER 1	
RIDER	STOPPING DISTANCE
Ofc. M. Nowlen	104.0 @ 40 MPH

2015 MOTO GUZZI NORGE	
RIDER	STOPPING DISTANCE
Ofc. M. Nowlen	92.5 @ 40 MPH

2015 MOTO GUZZI CALIFORNIA 1400	
RIDER	STOPPING DISTANCE
Dep. J Houle	N/A

TRANSITORY BRAKING
DRY TO WET - 40 MPH TO ZERO

2014 HONDA ST1300P	
RIDER	DRY TO WET STOP
Ofc. M. Nowlen	66.4 @ 40 MPH

2015 HARLEY DAVIDSON ELECTRA GLIDE	
RIDER	DRY TO WET STOP
Ofc. M. Nowlen	64.9 @ 40 MPH

2015 HARLEY DAVIDSON ROAD KING	
RIDER	DRY TO WET STOP
Ofc. M. Nowlen	68.8 @ 40 MPH

2015 BMW R1200RT-P	
RIDER	DRY TO WET STOP
Dep. J Houle	55.2 @ 40 MPH

2015 VICTORY COMMANDER 1	
RIDER	DRY TO WET STOP
Dep. J Houle	81.4 @ 40 MPH

2015 HARLEY DAVIDSON FLHTP ELECTRA SPECIAL	
RIDER	DRY TO WET STOP
Dep. J Houle	67.2 @ MPH

2015 MOTO GUZZI NORGE	
RIDER	DRY TO WET STOP
Ofc. M. Nowlen	60.3 @ 40 MPH

2015 MOTO GUZZI CALIFORNIA 1400	
RIDER	DRY TO WET STOP
Dep. J Houle	63.4 @ 40 MPH

ERGONOMICS EVALUATION RIDES

Due to unforeseen events conflicting with scheduled ride dates, coupled with injuries and duty schedules of the participating riders, we regret that this year's Ergonomics Ride was not conducted.

ACCELERATION EVALUATION

ACCELERATION EVALUATION

SPEED	HONDA ST1300P	BMW R1200RT-P	VICTORY COMMANDER 1
0-30 MPH	2.5	2.3	2.5
0-60 MPH	5.1	4.7	6.6
0-100 MPH	11.5	10.2	19.3
30-60 MPH	2.7	2.3	3.5
60-100 MPH	5.9	5.6	11.2
¼ MILE	13.55@107.6	13.6@111.1	15.10@92.5

SPEED	HD-ROAD KING	HD-ELECTRA GLIDE	HD-ELECTRA SPECIAL
0-30 MPH	2.7	1.8	2.8
0-60 MPH	6.2	5.3	6.0
0-100 MPH	19.9	18.2	15.7
30-60 MPH	4.2	3.5	3.4
60-100 MPH	13.3	12.2	11.3
¼ MILE	15.09@92.5	14.15@92.5	14.81@97.5

SPEED	ZERO ELECTRIC DSP	MOTO GUZZI NORGE	MOTO GUZZI CALIFORNIA 1400
0-30 MPH	3.4	3.2	2.8
0-60 MPH	7.2	6.0	5.7
0-100 MPH	15.6	13.4	14.6
30-60 MPH	3.8	2.3	2.9
60-100 MPH	8.7	7.7	8.4
¼ MILE	15.58@92.2	14.56@103.0	14.44@99.3

FUEL EFFICIENCY EVALUATION*

MOTORCYCLE	COMBINED AVERAGE Three 157 Mile Loops
2014 HONDA ST1300P	42.0 MPG
2014 BMW R1200 RT-P	41.9 MPG
2014 HARLEY DAVIDSON ELECTRA SPECIAL	
2014 HARLEY DAVIDSON ROAD KING	40.1 MPG
2014 HARLEY DAVIDSON ELECTRA GLIDE	36.2 MPG
2015 ZERO ELECTRIC DSP	N/A
2014 VICTORY COMMANDER 1	33.9 MPG
2014 MOTO GUZZI NORGE	41.0 MPG
2014 MOTO GUZZI CALIFORNIA 1400	39.4 MPG

*Since Ergonomics Ride was not conducted to obtain the fuel consumption data, previous year's figures were used.

HEAT EVALUATION

HEAT EVALUATION
IMMEDIATELY FOLLOWING 32 LAP COURSE

2014 HONDA ST1300P		
ITEM	MANUFACTURERS RECOMMENDATION	TEST RESULT
Radiator Water	208° to 216° Max.	Pass
Engine Oil	176° to 248° Max.	Pass
Transmission Oil	N/A Part of the engine case	N/A
RADIANT HEAT		
Radiator	192° F	
Brake Rotors	Front- 199 ° F Rear- 253 ° F	
Engine	200 ° F	
Transmission	182°	
Exhaust	275° F	

2015 BMW R1200RT-P		
ITEM	MANUFACTURERS RECOMMENDATION	TEST RESULT
Radiator Water	239° F	Pass
Engine Oil	302° F	Pass
Transmission Oil	302° F	Pass
RADIANT HEAT		
Radiator	136 ° F	
Brake Rotors	Front- 188 ° F Rear- 276 ° F	
Engine	203 ° F	
Transmission	221 ° F	
Exhaust	232 ° F	

2015 VICTORY COMMANDER 1		
ITEM	MANUFACTURERS RECOMMENDATION	TEST RESULT
Radiator Water	N/A	N/A
Engine Oil	180°F - 290° F	Pass
Transmission Oil	N/A	N/A
RADIANT HEAT		
Oil Cooler	195 ° F	
Brake Rotors	Front- 145 ° F Rear- 273 ° F	
Engine	201 ° F	
Transmission	241 ° F	
Exhaust	93 ° F	

HEAT EVALUATION

IMMEDIATELY FOLLOWING 32 LAP COURSE

2015 HARLEY-DAVIDSON ROAD KING		
ITEM	MANUFACTURERS RECOMMENDATION	TEST RESULT
Radiator Water	N/A	N/A
Engine Oil	280° to 410°	Pass
Transmission Oil	N/A	N/A
RADIANT HEAT		
Oil Cooler	N/A	
Brake Rotors	Front- 174 ° F Rear- 339 ° F	
Engine	364 ° F	
Transmission	222 ° F	
Exhaust	130 ° F	

2015 HARLEY DAVIDSON ELECTRA GLIDE		
ITEM	MANUFACTURERS RECOMMENDATION	TEST RESULT
Radiator Water	N/A	N/A
Engine Oil	280° F - 410° F	Pass
Transmission Oil	N/A	N/A
RADIANT HEAT		
Oil Cooler	247 ° F	
Brake Rotors	Front- 168 ° F Rear- 265 ° F	
Engine	385 ° F	
Transmission	250 ° F	
Exhaust	108 ° F	

2015 HARLEY DAVIDSON ELECTRA SPECIAL		
ITEM	MANUFACTURERS RECOMMENDATION	TEST RESULT
Radiator Water	N/A	N/A
Engine Oil	180° F - 290°F	Pass
Transmission Oil	N/A	N/A
RADIANT HEAT		
Oil Cooler	263	
Brake Rotors	Front- 155° F Rear- 372° F	
Engine	279 ° F	
Transmission	257 ° F	
Exhaust	372 ° F	

HEAT EVALUATION

IMMEDIATELY FOLLOWING 32 LAP COURSE

2015 ZERO ELECTRIC DSP		
ITEM	MANUFACTURERS RECOMMENDATION	TEST RESULT
Radiator Water	N/A	
Engine Oil	N/A	
Transmission Oil	N/A	
RADIANT HEAT		
Oil Cooler	N/A	
Brake Rotors	Front- ° F Rear- ° F	
Engine	N/A	
Transmission	N/A	
Exhaust	N/A	

2015 MOTO GUZZI NORGE		
ITEM	MANUFACTURERS RECOMMENDATION	TEST RESULT
Radiator Water	N/A	N/A
Engine Oil	320° MAX	Pass
Transmission Oil	248° MAX	Pass
RADIANT HEAT		
Oil Cooler	219 ° F	
Brake Rotors	Front- 249 ° F Rear- 156 ° F	
Engine	205 ° F	
Transmission	° F	
Exhaust	221° F	

2015 MOTO GUZZI CALIFORNIA 1400		
ITEM	MANUFACTURERS RECOMMENDATION	TEST RESULT
Radiator Water	N/A	N/A
Engine Oil	320° MAX	Pass
Transmission Oil	248° MAX	Pass
RADIANT HEAT		
Oil Cooler	254° F	
Brake Rotors	Front- 220° F Rear- 232 ° F	
Engine	236 ° F	
Transmission	186 ° F	
Exhaust	109° F	

SOUND LEVEL EVALUATION

SOUND LEVEL EVALUATION

2014 HONDA ST1300P	
SPEED	MEASURED dB
40 MPH (Sustained Speed)	102.1
60 MPH (Sustained Speed)	111.1
80 MPH (Sustained Speed)	117.5
Accelerate zero to 80 mph	117.9

2015 BMW R1200RT-P	
SPEED	MEASURED dB
40 MPH (Sustained Speed)	91.5
60 MPH (Sustained Speed)	98.5
80 MPH (Sustained Speed)	105.8
Accelerate zero to 80 mph	113.5

2015 HARLEY DAVIDSON ELECTRA SPECIAL	
SPEED	MEASURED dB
40 MPH (Sustained Speed)	103.2
60 MPH (Sustained Speed)	112.5
80 MPH (Sustained Speed)	119.1
Accelerate zero to 80 mph	119.3

2015 HARLEY DAVIDSON ROAD KING	
SPEED	MEASURED dB
40 MPH (Sustained Speed)	102.8
60 MPH (Sustained Speed)	113.3
80 MPH (Sustained Speed)	117.1
Accelerate zero to 80 mph	120.1

2014 HARLEY DAVIDSON ELECTRA GLIDE	
SPEED	MEASURED dB
40 MPH (Sustained Speed)	103.2
60 MPH (Sustained Speed)	112.5
80 MPH (Sustained Speed)	119.1
Accelerate zero to 80 mph	119.3

SOUND LEVEL EVALUATION

2015 VICTORY COMMANDER 1	
SPEED	MEASURED dB
40 MPH (Sustained Speed)	107.8
60 MPH (Sustained Speed)	117.3
80 MPH (Sustained Speed)	124.1
Accelerate zero to 80 mph	113.2

2015 ZERO ELECTRIC DSP	
SPEED	MEASURED dB
40 MPH (Sustained Speed)	N/A
60 MPH (Sustained Speed)	N/A
80 MPH (Sustained Speed)	N/A
Accelerate zero to 80 mph	N/A

2015 MOTO GUZZI NORGE	
SPEED	MEASURED dB
40 MPH (Sustained Speed)	108.9
60 MPH (Sustained Speed)	113.6
80 MPH (Sustained Speed)	116.5
Accelerate zero to 80 mph	127.9

2015 MOTO GUZZI CALIFORNIA 1400	
SPEED	MEASURED dB
40 MPH (Sustained Speed)	111.9
60 MPH (Sustained Speed)	127.3
80 MPH (Sustained Speed)	129.2
Accelerate zero to 80 mph	129.4

MECHANICAL EVALUATION

MECHANICAL EVALUATION 2014 HONDA ST1300-P

ELECTRICAL SYSTEM	CONSIDERATIONS	RATING
Battery	Accessibility, Group, Size	3
Alternator	Accessibility, Amperage	4
Stator	Accessibility, Amperage	4
Starter	Accessibility, Power	4
Ignition	Accessibility	3
Spark Plugs	Accessibility	3
Lights	Accessibility of Headlight Adjustment, Ease of Replacement	8
Fuse Box	Accessibility, Serviceability	5
FUEL SYSTEM	CONSIDERATIONS	RATING
Fuel Injection	Accessibility, Serviceability	2
Fuel Pump	Accessibility, Serviceability	2
Fuel Filter	Accessibility, Serviceability	2
Fuel Tank / Lines	Accessibility, Puncture Resistant	2
COOLING SYSTEM	CONSIDERATIONS	RATING
Radiator	Accessibility, Protection, Adequate Size	2
Water Pump	Accessibility, Belt Arrangement	3
Hoses	Accessibility	3
Coolant Recovery	Accessibility, Capacity	2
TRANSMISSION	CONSIDERATIONS	RATING
Transmission / Gearbox	Ease of Removal, Serviceability	5
Drain Plug	Ease of Removal, Protection	N/A
Fluid Level Sight Glass	Accessibility, Night Usability	1
Clutch	Accessibility, Serviceability	4
Cooler	Accessibility, Protection	N/A
BRAKES	CONSIDERATIONS	RATING
Master Cylinder	Accessibility, Protection	3
Power Brake Assist	Accessibility	N/A
Front Wheel Brakes	Accessibility	2
Rear Wheel Brakes	Accessibility	2
ABS System	Accessibility, Serviceability, Reparability	3
EXHAUST SYSTEM	CONSIDERATIONS	RATING
Catalytic Converter	Accessibility, Protection	2
Muffler	Accessibility	3
Pipes	Accessibility, Support	2
Header Pipes	Accessibility, Protection	4

**Bruce Wheeler 1 = Good, 5 = Poor

MECHANICAL EVALUATION 2014 HONDA ST1300 Cont.

BODY	CONSIDERATIONS	RATING
Windshield	Ease of Removal	1
Crash Bars	Accessibility, Ease of Removal	2
Patrol Equipment, Lights	Ease of Installation	2
Instrument Panels	Accessibility, Serviceability	3
Body Wiring	Accessibility, Serviceability, Protection	3
Seat	Ease of Removal	4
Body Panels	Ease of Removal	3
Handlebar Controls	Accessibility, Serviceability, Protection	2
Foot Controls	Accessibility, Serviceability, Protection	2
Saddlebags	Accessibility, Protection	1
ENGINE & ACCESSORIES	CONSIDERATIONS	RATING
Engine	Accessibility, Ease of Removal	5
Cylinder Head	Accessibility, Ease of Removal	4
Valve Covers	Accessibility, Valve Train Serviceability	4
Cylinder Removal	Accessibility, Serviceability,	N/A
Drain Plug	Ease of Removal, Durability	1
Fluid Level Sight Glass	Accessibility, Night Usability	1
Oil Filter	Accessibility, Capacity, Protection	2
Engine Mounts	Accessibility	4
Oil Coolers	Accessibility, Protection	N/A
STEERING & SUSPENSION	CONSIDERATIONS	RATING
Front Forks	Accessibility, Serviceability, Adjustability	3
Front Suspension	Accessibility, Serviceability	3
Rear Shock Absorbers	Accessibility, Serviceability	3
Rear Swing Arm	Accessibility, Serviceability	3
Front Tire	Accessibility, Ease of Removal	2
Axle Bearings & Seals	Accessibility, Serviceability	2
REAR AXLE DRIVE SHAFT	CONSIDERATIONS	RATING
Rear Gearbox	Accessibility, Serviceability	3
Drive Chain	Accessibility, Serviceability	N/A
Axle Bearings & Seals	Accessibility, Serviceability	3
Drive Shaft	Accessibility, Serviceability	4
Universal Joints	Accessibility, Serviceability	4
Rear Tire	Accessibility, Ease of Removal	3

**Bruce Wheeler 1 = Good, 5 = Poor

MECHANICAL EVALUATION

2015 BMW R1200RT-P

ELECTRICAL SYSTEM	CONSIDERATIONS	RATING
Battery	Accessibility, Group, Size	2
Alternator	Accessibility, Amperage	4
Stator	Accessibility, Amperage	4
Starter	Accessibility, Power	2
Ignition	Accessibility	1
Spark Plugs	Accessibility	4
Lights	Accessibility of Headlight Adjustment, Ease of Replacement	6
Fuse Box	Accessibility, Serviceability	
FUEL SYSTEM	CONSIDERATIONS	RATING
Fuel Injection	Accessibility, Serviceability	2
Fuel Pump	Accessibility, Serviceability	3
Fuel Filter	Accessibility, Serviceability	3
Fuel Tank / Lines	Accessibility, Puncture Resistant	3
COOLING SYSTEM	CONSIDERATIONS	RATING
Radiator	Accessibility, Protection, Adequate Size	3
Water Pump	Accessibility, Belt Arrangement	4
Hoses	Accessibility	3
Coolant Recovery	Accessibility, Capacity	2
TRANSMISSION	CONSIDERATIONS	RATING
Transmission / Gearbox	Ease of Removal, Serviceability	4
Drain Plug	Ease of Removal, Protection	1
Fluid Level Sight Glass	Accessibility, Night Usability	1
Clutch	Accessibility, Serviceability	2
Cooler	Accessibility, Protection	N/A
BRAKES	CONSIDERATIONS	RATING
Master Cylinder	Accessibility, Protection	2
Power Brake Assist	Accessibility	N/A
Front Wheel Brakes	Accessibility	1
Rear Wheel Brakes	Accessibility	1
ABS System	Accessibility, Serviceability, Reparability	3
EXHAUST SYSTEM	CONSIDERATIONS	RATING
Catalytic Converter	Accessibility, Protection	1
Muffler	Accessibility	1
Pipes	Accessibility, Support	2
Header Pipes	Accessibility, Protection	2

**Bruce Wheeler 1 = Good, 5 = Poor

MECHANICAL EVALUATION 2015 BMW R1200RT-P Cont.

BODY	CONSIDERATIONS	RATING
Windshield	Ease of Removal	1
Crash Bars	Accessibility, Ease of Removal	3
Patrol Equipment, Lights	Ease of Installation	3
Instrument Panels	Accessibility, Serviceability	3
Body Wiring	Accessibility, Serviceability, Protection	3
Seat	Ease of Removal	1
Body Panels	Ease of Removal	2
Handlebar Controls	Accessibility, Serviceability, Protection	2
Foot Controls	Accessibility, Serviceability, Protection	2
Saddlebags	Accessibility, Protection	1
ENGINE & ACCESSORIES	CONSIDERATIONS	RATING
Engine	Accessibility, Ease of Removal	5
Cylinder Head	Accessibility, Ease of Removal	2
Valve Covers	Accessibility, Valve Train Serviceability	1
Cylinder Removal	Accessibility, Serviceability,	2
Drain Plug	Ease of Removal, Durability	1
Fluid Level Sight Glass	Accessibility, Night Usability	1
Oil Filter	Accessibility, Capacity, Protection	1
Engine Mounts	Accessibility	3
Oil Coolers	Accessibility, Protection	N/A
STEERING & SUSPENSION	CONSIDERATIONS	RATING
Front Forks	Accessibility, Serviceability, Adjustability	2
Front Suspension	Accessibility, Serviceability	3
Rear Shock Absorbers	Accessibility, Serviceability	4
Rear Swing Arm	Accessibility, Serviceability	3
Front Tire	Accessibility, Ease of Removal	2
Axle Bearings & Seals	Accessibility, Serviceability	2
REAR AXLE DRIVE SHAFT	CONSIDERATIONS	RATING
Rear Gearbox	Accessibility, Serviceability	2
Drive Chain	Accessibility, Serviceability	N/A
Axle Bearings & Seals	Accessibility, Serviceability	3
Drive Shaft	Accessibility, Serviceability	3
Universal Joints	Accessibility, Serviceability	3
Rear Tire	Accessibility, Ease of Removal	1

**Bruce Wheeler 1 = Good, 5 = Poor

MECHANICAL EVALUATION

2015 MOTO GUZZI NORGE

ELECTRICAL SYSTEM	CONSIDERATIONS	RATING
Battery	Accessibility, Group, Size	2
Alternator	Accessibility, Amperage	4
Stator	Accessibility, Amperage	N/A
Starter	Accessibility, Power	3
Ignition	Accessibility	3
Spark Plugs	Accessibility	2
Lights	Accessibility of Headlight Adjustment, Ease of Replacement	4
Fuse Box	Accessibility, Serviceability	2
FUEL SYSTEM	CONSIDERATIONS	RATING
Fuel Injection	Accessibility, Serviceability	3
Fuel Pump	Accessibility, Serviceability	3
Fuel Filter	Accessibility, Serviceability	3
Fuel Tank / Lines	Accessibility, Puncture Resistant	3
COOLING SYSTEM	CONSIDERATIONS	RATING
Radiator	Accessibility, Protection, Adequate Size	N/A
Water Pump	Accessibility, Belt Arrangement	N/A
Hoses	Accessibility	N/A
Coolant Recovery	Accessibility, Capacity	N/A
TRANSMISSION	CONSIDERATIONS	RATING
Transmission / Gearbox	Ease of Removal, Serviceability	5
Drain Plug	Ease of Removal, Protection	1
Fluid Level Sight Glass	Accessibility, Night Usability	3
Clutch	Accessibility, Serviceability	5
Cooler	Accessibility, Protection	N/A
BRAKES	CONSIDERATIONS	RATING
Master Cylinder	Accessibility, Protection	3
Power Brake Assist	Accessibility	N/A
Front Wheel Brakes	Accessibility	2
Rear Wheel Brakes	Accessibility	2
ABS System	Accessibility, Serviceability, Reparability	3
EXHAUST SYSTEM	CONSIDERATIONS	RATING
Catalytic Converter	Accessibility, Protection	2
Muffler	Accessibility	2
Pipes	Accessibility, Support	2
Header Pipes	Accessibility, Protection	2

**Bruce Wheeler 1 = Good, 5 = Poor

MECHANICAL EVALUATION 2015 MOTO GUZZI NORG Cont.

BODY	CONSIDERATIONS	RATING
Windshield	Ease of Removal	1
Crash Bars	Accessibility, Ease of Removal	2
Patrol Equipment, Lights	Ease of Installation	3
Instrument Panels	Accessibility, Serviceability	3
Body Wiring	Accessibility, Serviceability, Protection	3
Seat	Ease of Removal	1
Body Panels	Ease of Removal	2
Handlebar Controls	Accessibility, Serviceability, Protection	2
Foot Controls	Accessibility, Serviceability, Protection	2
Saddlebags	Accessibility, Protection	2
ENGINE & ACCESSORIES	CONSIDERATIONS	RATING
Engine	Accessibility, Ease of Removal	5
Cylinder Head	Accessibility, Ease of Removal	4
Valve Covers	Accessibility, Valve Train Serviceability	2
Cylinder Removal	Accessibility, Serviceability,	3
Drain Plug	Ease of Removal, Durability	1
Fluid Level Sight Glass	Accessibility, Night Usability	1
Oil Filter	Accessibility, Capacity, Protection	
Engine Mounts	Accessibility	2
Oil Coolers	Accessibility, Protection	2/
STEERING & SUSPENSION	CONSIDERATIONS	RATING
Front Forks	Accessibility, Serviceability, Adjustability	3
Front Suspension	Accessibility, Serviceability	3
Rear Shock Absorbers	Accessibility, Serviceability	3
Rear Swing Arm	Accessibility, Serviceability	3
Front Tire	Accessibility, Ease of Removal	2
Axle Bearings & Seals	Accessibility, Serviceability	2
REAR AXLE DRIVE SHAFT	CONSIDERATIONS	RATING
Rear Gearbox	Accessibility, Serviceability	2
Drive Chain	Accessibility, Serviceability	N/A
Axle Bearings & Seals	Accessibility, Serviceability	4
Drive Shaft	Accessibility, Serviceability	4
Universal Joints	Accessibility, Serviceability	4
Rear Tire	Accessibility, Ease of Removal	2

**Bruce Wheeler 1 = Good, 5 = Poor

MECHANICAL EVALUATION 2015 ZERO ELECTRIC DSP

ELECTRICAL SYSTEM	CONSIDERATIONS	RATING
Battery	Accessibility, Group, Size	3
Alternator	Accessibility, Amperage	N/A
Stator	Accessibility, Amperage	N/A
Starter	Accessibility, Power	N/A
Ignition	Accessibility	N/A
Spark Plugs	Accessibility	N/A
Lights	Accessibility of Headlight Adjustment, Ease of Replacement	N/A
Fuse Box	Accessibility, Serviceability	2
FUEL SYSTEM	CONSIDERATIONS	RATING
Fuel Injection	Accessibility, Serviceability	N/A
Fuel Pump	Accessibility, Serviceability	N/A
Fuel Filter	Accessibility, Serviceability	N/A
Fuel Tank / Lines	Accessibility, Puncture Resistant	N/A
COOLING SYSTEM	CONSIDERATIONS	RATING
Radiator	Accessibility, Protection, Adequate Size	N/A
Water Pump	Accessibility, Belt Arrangement	N/A
Hoses	Accessibility	N/A
Coolant Recovery	Accessibility, Capacity	N/A
TRANSMISSION	CONSIDERATIONS	RATING
Transmission / Gearbox	Ease of Removal, Serviceability	N/A
Drain Plug	Ease of Removal, Protection	N/A
Fluid Level Sight Glass	Accessibility, Night Usability	N/A
Clutch	Accessibility, Serviceability	N/A
Cooler	Accessibility, Protection	N/A
BRAKES	CONSIDERATIONS	RATING
Master Cylinder	Accessibility, Protection	2
Power Brake Assist	Accessibility	N/A
Front Wheel Brakes	Accessibility	2
Rear Wheel Brakes	Accessibility	2
ABS System	Accessibility, Serviceability, Reparability	N/A
EXHAUST SYSTEM	CONSIDERATIONS	RATING
Catalytic Converter	Accessibility, Protection	N/A
Muffler	Accessibility	N/A
Pipes	Accessibility, Support	N/A
Header Pipes	Accessibility, Protection	N/A

**Bruce Wheeler 1 = Good, 5 = Poor

MECHANICAL EVALUATION 2015 ZERO ELECTRIC DSP Cont.

BODY	CONSIDERATIONS	RATING
Windshield	Ease of Removal	1
Crash Bars	Accessibility, Ease of Removal	2
Patrol Equipment, Lights	Ease of Installation	2
Instrument Panels	Accessibility, Serviceability	2
Body Wiring	Accessibility, Serviceability, Protection	3
Seat	Ease of Removal	2
Body Panels	Ease of Removal	2
Handlebar Controls	Accessibility, Serviceability, Protection	2
Foot Controls	Accessibility, Serviceability, Protection	2
Saddlebags	Accessibility, Protection	1
ENGINE & ACCESSORIES	CONSIDERATIONS	RATING
Engine	Accessibility, Ease of Removal	N/A
Cylinder Head	Accessibility, Ease of Removal	N/A
Valve Covers	Accessibility, Valve Train Serviceability	N/A
Cylinder Removal	Accessibility, Serviceability,	N/A
Drain Plug	Ease of Removal, Durability	N/A
Fluid Level Sight Glass	Accessibility, Night Usability	N/A
Oil Filter	Accessibility, Capacity, Protection	N/A
Engine Mounts	Accessibility	N/A
Oil Coolers	Accessibility, Protection	N/A
STEERING & SUSPENSION	CONSIDERATIONS	RATING
Front Forks	Accessibility, Serviceability, Adjustability	2
Front Suspension	Accessibility, Serviceability	2
Rear Shock Absorbers	Accessibility, Serviceability	2
Rear Swing Arm	Accessibility, Serviceability	3
Front Tire	Accessibility, Ease of Removal	3
Axle Bearings & Seals	Accessibility, Serviceability	2
REAR AXLE DRIVE SHAFT	CONSIDERATIONS	RATING
Rear Gearbox	Accessibility, Serviceability	N/A
Drive Chain	Accessibility, Serviceability	3
Axle Bearings & Seals	Accessibility, Serviceability	2
Drive Shaft	Accessibility, Serviceability	N/A
Universal Joints	Accessibility, Serviceability	N/A
Rear Tire	Accessibility, Ease of Removal	3

**Bruce Wheeler 1 = Good, 5 = Poor

MECHANICAL EVALUATION 2015 MOTO GUZZI CALIFORNIA 1400

ELECTRICAL SYSTEM	CONSIDERATIONS	RATING
Battery	Accessibility, Group, Size	2
Alternator	Accessibility, Amperage	3
Stator	Accessibility, Amperage	3
Starter	Accessibility, Power	3
Ignition	Accessibility	3
Spark Plugs	Accessibility	2
Lights	Accessibility of Headlight Adjustment, Ease of Replacement	2
Fuse Box	Accessibility, Serviceability	2
FUEL SYSTEM	CONSIDERATIONS	RATING
Fuel Injection	Accessibility, Serviceability	3
Fuel Pump	Accessibility, Serviceability	3
Fuel Filter	Accessibility, Serviceability	3
Fuel Tank / Lines	Accessibility, Puncture Resistant	3
COOLING SYSTEM	CONSIDERATIONS	RATING
Radiator	Accessibility, Protection, Adequate Size	N/A
Water Pump	Accessibility, Belt Arrangement	N/A
Hoses	Accessibility	N/A
Coolant Recovery	Accessibility, Capacity	N/A
TRANSMISSION	CONSIDERATIONS	RATING
Transmission / Gearbox	Ease of Removal, Serviceability	4
Drain Plug	Ease of Removal, Protection	2
Fluid Level Sight Glass	Accessibility, Night Usability	N/A
Clutch	Accessibility, Serviceability	5
Cooler	Accessibility, Protection	N/A
BRAKES	CONSIDERATIONS	RATING
Master Cylinder	Accessibility, Protection	3
Power Brake Assist	Accessibility	N/A
Front Wheel Brakes	Accessibility	2
Rear Wheel Brakes	Accessibility	2
ABS System	Accessibility, Serviceability, Reparability	3
EXHAUST SYSTEM	CONSIDERATIONS	RATING
Catalytic Converter	Accessibility, Protection	
Muffler	Accessibility	2
Pipes	Accessibility, Support	2
Header Pipes	Accessibility, Protection	2

**Bruce Wheeler 1 = Good, 5 = Poor

MECHANICAL EVALUATION 2015 MOTO GUZZI CALIFORNIA 1400 Cont.

Windshield	Ease of Removal	1
Crash Bars	Accessibility, Ease of Removal	1
Patrol Equipment, Lights	Ease of Installation	2
Instrument Panels	Accessibility, Serviceability	2
Body Wiring	Accessibility, Serviceability, Protection	3
Seat	Ease of Removal	1
Body Panels	Ease of Removal	2
Handlebar Controls	Accessibility, Serviceability, Protection	2
Foot Controls	Accessibility, Serviceability, Protection	2
Saddlebags	Accessibility, Protection	2
ENGINE & ACCESSORIES	CONSIDERATIONS	RATING
Engine	Accessibility, Ease of Removal	5
Cylinder Head	Accessibility, Ease of Removal	2
Valve Covers	Accessibility, Valve Train Serviceability	2
Cylinder Removal	Accessibility, Serviceability,	2
Drain Plug	Ease of Removal, Durability	2
Fluid Level Sight Glass	Accessibility, Night Usability	1
Oil Filter	Accessibility, Capacity, Protection	1
Engine Mounts	Accessibility	3
Oil Coolers	Accessibility, Protection	3
STEERING & SUSPENSION	CONSIDERATIONS	RATING
Front Forks	Accessibility, Serviceability, Adjustability	3
Front Suspension	Accessibility, Serviceability	3
Rear Shock Absorbers	Accessibility, Serviceability	3
Rear Swing Arm	Accessibility, Serviceability	3
Front Tire	Accessibility, Ease of Removal	2
Axle Bearings & Seals	Accessibility, Serviceability	2
REAR AXLE DRIVE SHAFT	CONSIDERATIONS	RATING
Rear Gearbox	Accessibility, Serviceability	4
Drive Chain	Accessibility, Serviceability	N/A
Axle Bearings & Seals	Accessibility, Serviceability	4
Drive Shaft	Accessibility, Serviceability	4
Universal Joints	Accessibility, Serviceability	4
Rear Tire	Accessibility, Ease of Removal	3

**Bruce Wheeler 1 = Good, 5 = Poor

COMMUNICATIONS EVALUATION RESULTS

The communications evaluation of each vehicle is conducted by technicians assigned to the Los Angeles County Sheriff's Department's Communications and Fleet Management Bureau. This evaluation concerns itself with the radio installation, the effect of radio operation on motorcycle performance and the effect of the motorcycle on radio performance.

The Electromagnetic Interference Susceptibility test is intended for use in the presence of electromagnetic fields resulting from use of public safety two-way radios.

Motorcycle performance must not be affected in any way by transmissions from a radio and antenna installed on the motorcycle and operating in any of the frequency ranges of 450 to 512 MHz, and having a radio frequency output no more than 50 watts. Motorcycle performance shall not be affected by the presence of another motorcycle equipped with the above described radio and operated next to the subject motorcycle.

Radiated and conducted electromagnetic interference motorcycle systems and accessories shall be designed to reduce interference with the use of public safety radio receivers or electronic sirens or sound amplifiers. The effective sensitivity of a receiver installed on the motorcycle shall not be reduced by more than the amount tabulated below for each frequency band:

FREQUENCY BAND	ALLOWABLE DEGRADATION
450 to 512 MHz	3 dB

Degradation is the difference in effective receiver sensitivity measured with the vehicle engine and accessories turned off as compared to that measured with the engine and accessories turned on.

Sensitivity is measured in terms of the 12 dB Sinad signal as defined in EIA Standard RS-204. To determine effective sensitivity, the receiver is connected to the antenna through an isolating tee connector which allows introduction of the signal generator through the isolated port. Comparative signal strength readings are then taken with and without the interference present.

COMMUNICATION NOISE EVALUATION

2014 HONDA ST 1300P

RADIO MAKE	MODEL NO.	ANTENNA TYPE	LOCATION
Motorola XTL-5000	M20SSS9PW1AN	5dB Gain Whip	Rear

FREQUENCY: 483.0875 MHz

WITH ANTENNA	12 dB SINAD	20 dB QUIETING	DESENS dB
Engine Off	-88dB	-92dB	2dB
Engine Idle (No Acc)	-88dB	-92dB	2dB
Engine High RPM (No Acc)	-88dB	-92dB	2dB
Engine Idle W/Air	N/A	N/A	N/A
Engine Idle W/ Lights	-88dB	-9dB	2dB
Engine Idle W/Heater	N/A	N/A	N/A
Engine Idle W/All Acc	-88dB	-92dB	2dB
Engine High RPM W/All Acc	-88dB	-92dB	2dB

Also Tested: Monitored approx. 200 frequencies between. No spurious signal detected. Radios used XTS-5000 portable.

Glove Compartment Accessibility – (Undercover Use)	Rating **
Radio Control Head	5
Speakers	5
Microphones	5
One Radio Installation	5
Antenna Installation	5
Battery Terminal Connection	5
Accommodation for Cables	5
Hidden Siren Installation	N/A
Clip – on Connections for Accessories	5

** 1 – Poor 5 – Average 10 – Outstanding

COMMUNICATION NOISE EVALUATION

2015 BMW R1200 RT-P

RADIO MAKE	MODEL NO.	ANTENNA TYPE	LOCATION
Motorola XTL-5000	M20SSS9PW1AN	3dB Gain Whip	Rear

FREQUENCY: 483.0875 MHz

WITH ANTENNA	12 dB SINAD	20 dB QUIETING	DESENS dB
Engine Off	-89dBm	-93dBm	2dBm
Engine Idle (No Acc)	-89dBm	-93dBm	2dBm
Engine High RPM (No Acc)	-89dBm	-93dBm	2dBm
Engine Idle W/Air			
Engine Idle W/ Lights	-89dBm	-93dBm	2dBm
Engine Idle W/Heater			
Engine Idle W/All Acc	-89dBm	-93dBm	2dBm
Engine High RPM W/All Acc	-89dBm	-93dBm	2dBm

Also Tested: Monitored approx. 200 frequencies spurious signal detected at 483,0125,483,5125.
Radios used XTS-5000 portable.

Glove Compartment Accessibility – (Undercover Use)	Rating **
Radio Control Head	N/A
Speakers	N/A
Microphones	N/A
One Radio Installation	N/A
Antenna Installation	N/A
Battery Terminal Connection	N/A
Accommodation for Cables	N/A
Hidden Siren Installation	N/A
Clip – on Connections for Accessories	N/A

** 1 – Poor 5 – Average 10 – Outstanding

COMMUNICATION NOISE EVALUATION

2015 HARLEY DAVIDSON ELECTRA SPECIAL

RADIO MAKE	MODEL NO.	ANTENNA TYPE	LOCATION
Motorola XTL-5000	M20SSS9PW1AN	5dB Gain Whip	Rear

FREQUENCY: 483.0875 MHz

WITH ANTENNA	12 dB SINAD	20 dB QUIETING	DESENS dB
Engine Off	-88dB	-90dB	0dB
Engine Idle (No Acc)	-88dB	-90dB	0dB
Engine High RPM (No Acc)	-88dB	-90dB	0dB
Engine Idle W/Air	N/A	N/A	N/A
Engine Idle W/ Lights	-88dB	-90dB	0dB
Engine Idle W/Heater	N/A	N/A	N/A
Engine Idle W/All Acc	-88dB	-90dB	0dB
Engine High RPM W/All Acc	-88dB	-90dB	0dB

Also Tested: Monitored approx. 200 frequencies between. No spurious signal detected. Radios used XTS-5000 portable.

Glove Compartment Accessibility – (Undercover Use)	Rating **
Radio Control Head	5
Speakers	10
Microphones	4
One Radio Installation	5
Antenna Installation	5
Battery Terminal Connection	6
Accommodation for Cables	5
Hidden Siren Installation	N/A
Clip – on Connections for Accessories	5

** 1 – Poor 5 – Average 10 – Outstanding

COMMUNICATION NOISE EVALUATION

2015 HARLEY- DAVIDSON ROAD KING

RADIO MAKE	MODEL NO.	ANTENNA TYPE	LOCATION
Motorola XTL-5000	M20SSS9PW1AN	5dB Gain Whip	Rear

FREQUENCY: 483.0875 MHz

WITH ANTENNA	12 dB SINAD	20 dB QUIETING	DESENS dB
Engine Off	-81dB	-93dB	1dB
Engine Idle (No Acc)	-81dB	-93dB	1dB
Engine High RPM (No Acc)	-88dB	-93dB	1dB
Engine Idle W/Air	N/A	N/A	N/A
Engine Idle W/ Lights	-81dB	-93dB	1dB
Engine Idle W/Heater	N/A	N/A	N/A
Engine Idle W/All Acc	-89dB	-93dB	1dB
Engine High RPM W/All Acc	-88dB	-93dB	2dB

Also Tested: Monitored approx. 200 frequencies between. No spurious signal detected. Radios used XTS-5000 portable.

Glove Compartment Accessibility – (Undercover Use)	Rating **
Radio Control Head	5
Speakers	5
Microphones	5
One Radio Installation	5
Antenna Installation	5
Battery Terminal Connection	5
Accommodation for Cables	5
Hidden Siren Installation	N/A
Clip – on Connections for Accessories	5

** 1 – Poor 5 – Average 10 – Outstanding

COMMUNICATION NOISE EVALUATION

2015 HARLEY- DAVIDSON ELECTRA GLIDE

RADIO MAKE	MODEL NO.	ANTENNA TYPE	LOCATION
Motorola XTL-5000	M20SSS9PW1AN	5dB Gain Whip	Rear

FREQUENCY: 483.0875 MHz

WITH ANTENNA	12 dB SINAD	20 dB QUIETING	DESENS dB
Engine Off	-89dB	-92dB	1dB
Engine Idle (No Acc)	-89dB	-92dB	1dB
Engine High RPM (No Acc)	-88dB	-92dB	1dB
Engine Idle W/Air	N/A	N/A	N/A
Engine Idle W/ Lights	-89dB	-92dB	1dB
Engine Idle W/Heater	N/A	N/A	N/A
Engine Idle W/All Acc	-89dB	-92dB	1dB
Engine High RPM W/All Acc	-88dB	-92dB	1dB

Also Tested: Monitored approx. 200 frequencies between. No spurious signal detected. Radios used XTS-5000 portable.

Glove Compartment Accessibility – (Undercover Use)	Rating **
Radio Control Head	5
Speakers	5
Microphones	5
One Radio Installation	5
Antenna Installation	5
Battery Terminal Connection	5
Accommodation for Cables	5
Hidden Siren Installation	N/A
Clip – on Connections for Accessories	5

** 1 – Poor 5 – Average 10 – Outstanding

COMMUNICATION NOISE EVALUATION

2015 VICTORY COMMANDER 1

RADIO MAKE	MODEL NO.	ANTENNA TYPE	LOCATION
Motorola XTL-5000	M20SSS9PW1AN	5dB Gain Whip	Rear

FREQUENCY: 483.0875 MHz

WITH ANTENNA	12 dB SINAD	20 dB QUIETING	DESENS dB
Engine Off	-88dB	-92dB	2dB
Engine Idle (No Acc)	-88dB	-92dB	2dB
Engine High RPM (No Acc)	-88dB	-92dB	2dB
Engine Idle W/Air	N/A	N/A	N/A
Engine Idle W/ Lights	-88dB	-92dB	2dB
Engine Idle W/Heater	N/A	N/A	N/A
Engine Idle W/All Acc	-88dB	-92dB	2dB
Engine High RPM W/All Acc	-88dB	-92dB	2dB

Also Tested: Monitored approx. 200 frequencies between. No spurious signal detected. Radios used XTS-5000 portable.

Glove Compartment Accessibility – (Undercover Use)	Rating **
Radio Control Head	5
Speakers	5
Microphones	5
One Radio Installation	5
Antenna Installation	5
Battery Terminal Connection	5
Accommodation for Cables	5
Hidden Siren Installation	N/A
Clip – on Connections for Accessories	5

** 1 – Poor 5 – Average 10 – Outstanding

COMMUNICATION NOISE EVALUATION

2015 ZERO ELECTRIC DSP

RADIO MAKE	MODEL NO.	ANTENNA TYPE	LOCATION
Motorola XTL-5000	M20SSS9PW1AN	3dB Gain Whip	Rear

FREQUENCY: 483.0875 MHz

WITH ANTENNA	12 dB SINAD	20 dB QUIETING	DESENS dB
Engine Off	-90dBm	-94dBm	2dBm
Engine Idle (No Acc)			
Engine High RPM (No Acc)			
Engine Idle W/Air			
Engine Idle W/ Lights			
Engine Idle W/Heater			
Engine Idle W/All Acc			
Engine High RPM W/All Acc			

Also Tested: Monitored approx. 200 frequencies between 483,4000 spurious signal detected.
Radios used XTS-5000 portable & XTS-3000 portable

Glove Compartment Accessibility – (Undercover Use)	Rating **
Radio Control Head	N/A
Speakers	N/A
Microphones	N/A
One Radio Installation	N/A
Antenna Installation	N/A
Battery Terminal Connection	N/A
Accommodation for Cables	N/A
Hidden Siren Installation	N/A
Clip – on Connections for Accessories	N/A

** 1 – Poor 5 – Average 10 – Outstanding

COMMUNICATION NOISE EVALUATION

2015 MOTO GUZZI NORGE

RADIO MAKE	MODEL NO.	ANTENNA TYPE	LOCATION
Motorola XTL-5000	M20SSS9PW1AN	5dB Gain Whip	Rear

FREQUENCY: 483.0875 MHz

WITH ANTENNA	12 dB SINAD	20 dB QUIETING	DESENS dB
Engine Off	-88dB	-98dB	2dB
Engine Idle (No Acc)	-88dB	-98dB	2dB
Engine High RPM (No Acc)	-88dB	-98dB	2dB
Engine Idle W/Air	N/A	N/A	N/A
Engine Idle W/ Lights	-88dB	-98dB	2dB
Engine Idle W/Heater	N/A	N/A	N/A
Engine Idle W/All Acc	-88dB	-98dB	2dB
Engine High RPM W/All Acc	-88dB	-98dB	2dB

Also Tested: Monitored approx. 200 frequencies between. No spurious signal detected. Radios used XTS-5000 portable.

Glove Compartment Accessibility – (Undercover Use)	Rating **
Radio Control Head	5
Speakers	10
Microphones	4
One Radio Installation	5
Antenna Installation	5
Battery Terminal Connection	6
Accommodation for Cables	5
Hidden Siren Installation	N/A
Clip – on Connections for Accessories	5

** 1 – Poor 5 – Average 10 – Outstanding

COMMUNICATION NOISE EVALUATION

2015 MOTO GUZZI CALIFORNIA 1400

RADIO MAKE	MODEL NO.	ANTENNA TYPE	LOCATION
Motorola XTL-5000	M20SSS9PW1AN	5dB Gain Whip	Rear

FREQUENCY: 483.0875 MHz

WITH ANTENNA	12 dB SINAD	20 dB QUIETING	DESENS dB
Engine Off	-87dB	-90dB	3dB
Engine Idle (No Acc)	-87dB	-89dB	3dB
Engine High RPM (No Acc)	-87dB	-89dB	3dB
Engine Idle W/Air	N/A	N/A	N/A
Engine Idle W/ Lights	-87dB	-89dB	3dB
Engine Idle W/Heater	N/A	N/A	N/A
Engine Idle W/All Acc	-87dB	-89dB	3dB
Engine High RPM W/All Acc	-87dB	-89dB	3dB

Also Tested: Monitored approx. 200 frequencies between. No spurious signal detected. Radios used XTS-5000 portable.

Glove Compartment Accessibility – (Undercover Use)	Rating **
Radio Control Head	5
Speakers	10
Microphones	4
One Radio Installation	5
Antenna Installation	5
Battery Terminal Connection	6
Accommodation for Cables	5
Hidden Siren Installation	N/A
Clip – on Connections for Accessories	5

** 1 – Poor 5 – Average 10 – Outstanding