

MOPED INSPECTIONS

A moped can have two or three wheels. The engine must have no more than 50 cc displacement and 2 horse power (1,492 watts). The device must not be capable of going faster than 30 miles per hour (mph) on a level surface and must not require the operator to use a clutch.

A moped has 8 basic systems: (1) Engine, (2) Fuel, (3) Exhaust, (4) Frame and suspension, (5) Wheels, tires and brakes, (6) Drive train, (7) Controls and gauges, (8) Lights and electrical.

The following items need to be inspected, provided they can be easily accessed.

Battery & Wires	Final Drive	Suspension
Brakes	Frame	Tires
Cables	Fuel system	Wheels
Center & Kick Stands	Lamps & reflectors	Wheel alignment
Controls	Odometer	Wheel bearings
Engine	Registration	Windscreen
Exhaust	Seats & Foot rests	
Fenders	Steering	



BATTERY & WIRES

Battery & wires must have secure, tight connections; battery vent tube should not be able to drip on the chain (if the moped has one). Battery must be secure in the battery compartment and the case should not leak. Wires should be insulated or secured in a manner to prevent a short circuit.



BRAKES

There are two basic types of brakes: drum and disc. There are also two types of systems: split and independent. A split system must have a brake failure warning lamp. On mopeds, the rear brake is applied by a hand lever on the left side of the handlebars. The front brake is applied by a hand lever near the right handle grip. A split braking system activates both brakes with one lever on the left handlebar. An antilock braking system (ABS) is an extra feature that will possibly be available on mopeds in the future. If the ABS is inoperative, the brakes can still pass the inspection, provided the regular brakes work properly.

Check front and rear brakes for stopping power and noise at about 4 mph. If brakes are noisy, they may be worn too thin.

Fail brakes if:

- Brakes do not lock the wheels when applied fully while bike is moving about 4 mph.
- Hydraulic brake pressure cannot be maintained for at least ten seconds.
- Hydraulic fluid level is below the minimum mark or not visible through view port; the master cylinder is not securely mounted; brake fluid is leaking somewhere. (Since many mopeds have most of the brake lines covered by cowling, the most likely place a leak will be spotted is at the lower end of a line, by the wheel).



- A 3-wheeled moped does not have a functioning parking brake.
- Cables are frayed, broken or routed so as to be pinched or hinder movement.
- A lever is out of adjustment (lever contacts handle grip when fully depressed) or does not snap back to the rest position when released.

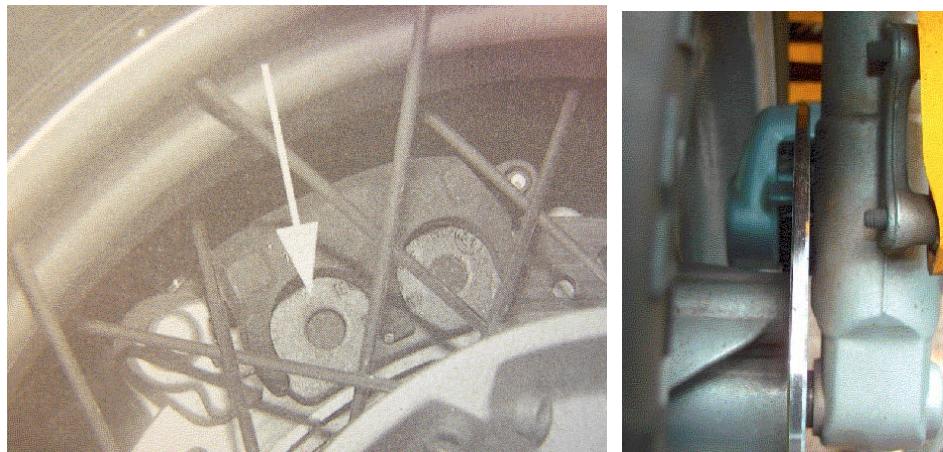


► Disc is deeply grooved or scored. This picture shows only a minor score.

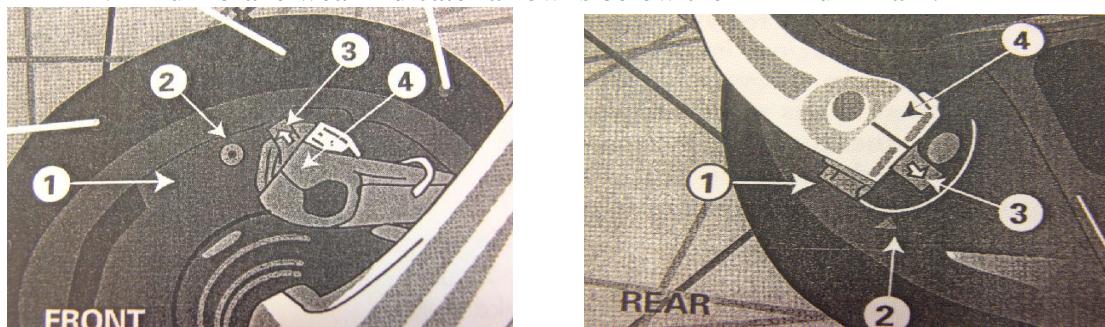


► Disc pad thickness is less than 1/16 inch or 2 millimeters (check the lever adjustment reserves: if they are minimal, it is probable that pads are very worn).

Some pads can be checked with very little effort. In the example on the left, the pads are at the minimum level when the rotor can be seen through the hole. On the right, the indentations disappear at minimum level.



► Drum brake wear indicator arrow is below the minimum mark.



1. Brake panel; 2. Reference mark on brake panel; 3. Arrow on brake arm; 4. Brake arm

► Lever adjustment screws are broken or stripped.



CENTER STAND & KICK STAND

Check to be sure the stand holds up the motorcycle and continues to hold it when turning the handlebars from stop to stop.

Fail stand if:

- It does not hold the bike up.
- When not in use, the stand does not fold up toward the rear of the bike and stay close to the frame. A dangling stand can catch the pavement when leaning into a turn and cause a crash.

CONTROLS AND INDICATORS

If a control exists, it should be located as follows:

Left Handlebar:

Headlamp
Upper/lower beam control switch
Horn
Rear brake lever

Right Handlebar:

Front brake lever
Engine kill switch
Turn signal switch (either bar)
Throttle

Check to see that cables allow for free, smooth movements. Cables usually fray before they break completely. When a cable begins to fray, its action will feel rough and gritty. Levers and controls should be tight in the mounts but pivot freely. The **throttle**, and **brake levers** should automatically return to the resting position when released.

Fail cables if:

- They have loose connections or are frayed so as not to allow free movement of control lever.

Fail kill switch if:

- It fails to kill the engine, or it is missing on a moped manufactured after 9/1/74.

Fail Horn if:

- It is inoperative, not audible from a distance of not less than 200 feet, or the horn switch is not on the left handlebar and readily accessible to the operator.

Fail Mirror if:

- Field of view is inadequate, mirror is insecurely mounted, ease and stability of adjustment is inadequate, there are exposed sharp edges. County Ordinance requires only one mirror so located as to reflect to the driver a view of the highway for a distance of at least 200 feet to the rear.

Odometer: An odometer is required and is almost always housed within the speedometer and turned by the same cable. Therefore, if the speedometer does not work, it is very likely that the odometer doesn't work. A speedometer is not required, but if one exists, it must display miles per hour.

Fail Speedometer-odometer if:

- The odometer does not operate.
- The speedometer does not register speed in miles per hour (mph).

ENGINE

The engine must be securely mounted to the frame and be free of serious fluid leaks. The oil level need not be checked unless the engine has a serious oil leak. If dipstick has threads, don't thread it in just to take an oil level measurement. Instead put the dipstick in until it stops against the threads and then pull it out for the reading. The dipstick markings are calibrated for this procedure. When reading the level, hold the dipstick vertical to avoid getting an erroneous reading. If the level is low, advise the owner.



Two-stroke engines usually have an oil reservoir located under the seat. If you notice a sight glass for oil but do not see oil in it, advise the owner.

Some bikes use oil or water to cool the engine. If a moped has a cooling system, check it for leaks.

Fail engine if:

- It is not securely mounted.
- Any engine mount bolt is missing or loose.
- A two-stroke oil reservoir is removed so engine can run faster.

EXHAUST SYSTEM

Components must be securely mounted, have no leaks or an unacceptably loud sound level. Welding cracks is an acceptable method of repairing an exhaust pipe.

Fail exhaust system if:

- It is leaking.
- Any component part is not securely fastened.
- A part of the system is positioned so it is possible to have bodily contact with it during normal operation.
- Any component part is missing, equipped with exhaust cut-outs, by-pass or similar devices.
- Exhaust gas is not exiting beyond the passenger.
- Emits a noise louder than 100 decibels at half throttle.

Note: 291-24, Hawaii Revised Statutes prohibits modifying the muffler on a moped to increase the level of sound emitted. A decibel reading must be taken for each moped to obtain objective evidence that it is not too loud.

Determine half throttle with the engine off. With the throttle in the fully closed position, gently turn the throttle grip until you feel the play in the cable end. At that point, place a mark on the movable portion of the throttle grip and on an adjacent non-movable part. Open the throttle to full position and place a mark on the non-movable part that aligns with the mark on the grip. Place a mark on the mid-point of the distance between marks on the non-movable part. This middle mark represents half throttle.

The sound meter, which will be a separate unit, is to be held above the examiner's head while standing where the throttle can be moved. Then take two decibel measurements by gradually (about two seconds) accelerating the engine to 1/2 throttle, hold it there for a second or two and close it. The meter will register the highest decibel reading and store it until the next test. Record the reading and repeat the process. If either of the two tests show a decibel reading higher than 100, the muffler shall be failed.

FENDERS

There is no federal standard for moped fenders and no state law. However, 19-131-3(6), Hawaii Administrative Rules requires all mopeds to have a fender over each wheel. The fenders must cover the entire width of the tire tread above that portion of the tire circumference from fifteen degrees in front to 75 degrees to the rear of a vertical line through the center.

FINAL DRIVE

Drive chain, belt, or shaft (if present) protective coverings shall be inspected for condition, mounting, looseness, size, and any hazardous protrusions.

FRAME

The frame is inspected visually without removing or disassembling any body plastic or component. A moped frame must be failed if it is cracked, or otherwise damaged in a manner that will reduce its strength or cause the wheels to be out of alignment.

FUEL SYSTEM

Moped should be on level surface and should be in an upright position: Check fuel tank and lines for leaks and loose connections and damaged, worn or loose lines that are potential leaks.

Fail fuel if:

- The fuel is leaking – especially near the cylinder head or exhaust pipe.
- Fuel cap does not cover fill opening tightly or is not securely in place.
- There is no fuel cut-off valve, unless a vacuum system is used.
- If the moped has an aftermarket carburetor that is designed to increase the speed capability of the moped.

LAMPS AND REFLECTORS

Tables III & IV below list the required lights and reflectors for motorcycles. Mopeds are not required to have turn signals, because they are designed to travel less than 31 mph.

Fail light and reflector items if:

- **Missing**

► **Damaged** so that light shows through the damaged portion of the lens (placing tape over the damaged portion of the lens is not adequate to pass the inspection but gluing that restores proper function is adequate) or moisture is present inside the lens, or reflector does not redirect light properly.

► **Not properly or securely installed**, or directs light improperly (Vehicle damage can cause a properly installed lamp or reflector to improperly direct light).

► **Not of an approved type or color** (See Tables III & IV and Hawaii Administrative Rules 19-132). Headlamps must emit white light (291-25(b), HRS).

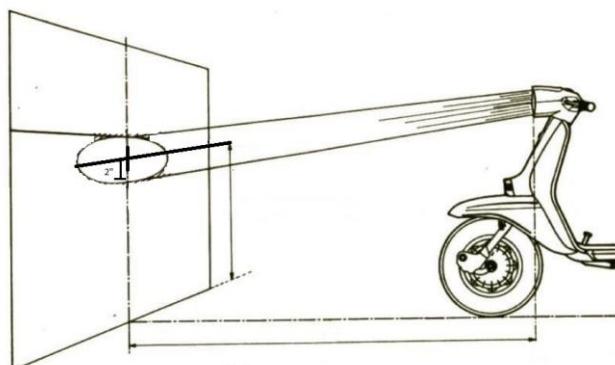
► **Obscured** or blocked in any manner or is **covered** with material that is non-transparent and which diminishes the function of the lamp, lens or reflectors so as to put it out of conformance with FMVSS and local laws, ordinances or rules (the burden of proof of conformance is on the vehicle owner). Lamps or reflectors that are not required may be installed, provided they do not diminish the effectiveness of any required lamp or reflector.

- **Inoperable**, or operates improperly.

► **Headlamp** cannot produce a light sufficient to reveal any person or object straight ahead for a distance of two hundred feet.

- There are more than two **headlamps** installed.

If an electronic headlamp aimer is not available, a wall or screen may be used as follows.



When checking aim, all tires should be properly inflated and the moped should have a rider on it (preferred weight, about 160 pounds).

If possible place the moped 20 feet from the wall. If this is not possible, use 10 feet. Make a straight line on a level, flat floor perpendicular to the wall. The line should be long enough to have both tires on it when the front of the headlamp is 10 or 20 feet from the wall. Make a vertical line on the wall that intersects with the line on the floor. It may be convenient to put inch marks on the vertical line.

1. Put the moped on its center stand with the front tire on the ground. Measure the distance from the ground and the center of the headlamp (lamp height).

2. Mark the vertical wall with a horizontal line indicating lamp height. Then draw a parallel line 2 inches below the first line called the "2-inch line" (if you are using 20 feet). Make a one-inch line if using 10 feet. Be sure the moped is perpendicular to the wall.

3. Take the moped off the center stand, sit on it and make the handlebars parallel to the wall.

4. Notice where the "hot spot" is (brightest part of light). The center of the low beam hot spot should line up with the vertical line on wall and the 1" or 2" line. The high beam should be on the top horizontal line.

5. If the headlight is out of alignment, mark a defect.

► **Turn signal** flashing rate should not be less than 60 per minute or more than 120. However, since mopeds are not required to have turn signals, do not fail the moped if the turn signals do not operate or operate improperly. Simply advise the customer.

Table III
FMVSS Required Motor Vehicle Lighting Equipment
[All Passenger Cars and Motorcycles, and Multipurpose Passenger Vehicles, Trucks, Buses and Trailers of Less Than 80 Inches (2032 mm) Overall Width]

Item	Passenger cars, multipurpose passenger vehicles, trucks, and buses	Trailers	Motorcycles	Applicable SAE standards or recommended practice (See S5 for subreferenced SAE materials)
Headlamps	See S7	None	See S7.9	J566, 1/60.
Taillamps	2 red	2 red	1 red	J585e, 9/77
Stoplamps	2 red	2 red	1 red	J586, 2/84.
High-mounted stoplamp	1 red	Not required	Not required	J186a, 9/77.
License plate lamp	1 white	1 white	1 white	J587, 10/81.
Parking lamps	2 amber or white	None	None	J222, 12/70
Reflex reflectors	4 red; 2 amber	4 red; 2 amber	3 red; 2 amber	J594f, 1/77
Intermediate side reflex reflectors.	2 amber	2 amber	None	J594f, 1/77
Intermediate side marker lamps	2 amber	2 amber	None	J592e, 7/72
Side marker lamps	2 red; 2 amber	2 red; 2 amber	None	J592e, 7/72
Backup lamp	1 white	None	None	J593c, 2/68
Turn signal lamps	2 red or amber; 2 amber.	2 red or amber	2 amber; 2 red or amber.	J588, 11/84

Table IV
FMVSS Location of Required Equipment
[All Passenger Cars and Motorcycles, and Multipurpose Passenger Vehicles, Trucks, Buses and Trailers of Less Than 80 Inches (2032 mm) Overall Width]

Item	Location on		Height above road surface measured from center of item on vehicle at curb weight
	Passenger cars, multipurpose passenger vehicles, trucks, trailers and buses	Motorcycles	
Headlamps	On the front, each headlamp providing the lower beam, at the same height, 1 on each side of the vertical centerline, each headlamp providing the upper beam, at the same height, 1 on each side of the vertical center-line, as far apart as practicable. See also S7.	See S7.9 of FMVSS 108	Not less than 22 inches (55.9 cm) nor more than 54 inches (137.2 cm).
Taillamps	On the rear--1 on each side of the vertical centerline, at the same height, far apart as practicable.	On the rear--on the vertical centerline except that if two are used, they shall be symmetrically disposed about the vertical centerline.	Not less than 15 inches, nor more than 72 inches.
Stoplamps	On the rear--1 on each side of the vertical centerline, at the same height, and as far apart as practicable.	On the rear--on the vertical centerline except that if two are used, they shall be symmetrically disposed about the vertical centerline.	Not less than 15 inches, nor more than 72 inches.
High-mounted stoplamp	On the rear, on the vertical centerline [See S5.1.1.27 S5.3.1.8, and Table III], effective 9/1/85, for passenger cars only.	Not required	See S5.3.1.8 for passenger cars. Not less than 34 inches for multipurpose, passenger vehicles, trucks, and buses.

License plate lamp	At rear license plate, to illuminate the plate from the top or sides	At rear license plate	No requirement
Parking lamps	On the front – 1 on each side of the vertical centerline, at the same height, and as far apart as practicable.	Not required	Not less than 15 inches, nor more than 60 inches.
Reflex reflectors	On the rear--1 red on each side of the vertical centerline, at the same height, and as far apart as practicable. On each side – 1 red as far to the rear as practicable, and 1 amber as far to the front as practicable.	On the rear--1 red on the vertical centerline except that, if two are used on the rear, they shall be symmetrically disposed about the vertical centerline. On each side – 1 red as far to the rear as practicable, and 1 amber as far to the front as practicable.	Not less than 15 inches, nor more than 60 inches.
Backup lamp	On the rear	Not required	Not required
Turn signal lamps	At or near the front – 1 amber on each side of the vertical centerline, at the same height, and as far apart as practicable. On the rear – 1 red or amber on each side of the vertical centerline, at the same height, and as far apart as practicable.	At or near the front – 1 amber on each side of the vertical centerline, at the same height, and having a minimum horizontal separation distance (centerline of lamps) separation distance between lamp and headlamps is 4 inches. At or near the rear – 1 red or amber on each side of the vertical centerline, at the same height and having a minimum horizontal separation distance (centerline to centerline of lamps) of 9 inches. Minimum edge to edge separation distance between lamp and tail or stop lamp is 4 inches, when a single stop and taillamp is installed on the vertical centerline and the turn signal lamps are red.	Not less than 15 inches, nor more than 83 inches.
Side marker lamps	On each side--1 red as far to the rear as practicable, and 1 amber as far to the front as practicable.	Not required	Not less than 15 inches.
Intermediate side marker lamps	On each side--1 amber located at or near the midpoint between the front and rear side marker lamps.	Not required	Not less than 15 inches.
Intermediate side marker reflectors	On each side--1 amber located at or near the midpoint between the front and rear side marker reflectors.	Not required	Not less than 15 inches, nor more than 60 inches.

REGISTRATION & INSURANCE

Fail registration if:

- Vehicle description & VIN do not match the vehicle.
- License plate numbers & license plate decal on vehicle do not match the registration certificate.

VIN on the vehicle is not in agreement with:

- Registration document.
- Insurance Card VIN (commercial moped). If a rental company has fleet insurance, the VIN for each moped will not be listed.
- Hawaii Insurance Identification Card is not an original (commercial moped).
- Name on card does not match registration certificate. Insurance must be in effect at the time of inspection (commercial moped).

Plate:

- The plate and decal numbers do not match the registration.
- Plate is not clearly visible, secure and legible.

SEATS & FOOT RESTS

Only the driver may ride a two wheel moped. Some mopeds are manufactured with a saddle large enough to carry two people; some manufacturers even install foot pegs for a passenger. In Hawaii, passenger foot pegs are not allowed, because their presence, coupled with a large saddle imply that two people are allowed to ride on a moped.

Fail seats if:

- They are not securely fastened.
- Foot rests are installed for a passenger seat on a two-wheeled moped.

STEERING

Wobbly movement of the handlebars or rough movement suggests worn steering head bearings or maladjustment. With bike on center stand, check for bearing wear and tightness by grasping each side of the front fork at the axle and push and pull gently, or from the saddle, pull and push the handlebars gently. There should be no play. Check steering for full range of movement from stop to stop. There should be no binding. Test for proper steering looseness by pushing the front wheel to one side lightly. If the wheel continues moving, the steering is not too tight. The handlebar should line up with the front wheel in the straight position and the front wheel should line up with the frame and rear wheel.

Fail Steering if:

- Steering is too tight or does not move freely from stop to stop.
- Play is felt at the steering bearings.
- The handlebars do not line up with the front wheel.
- A handlebar grip is missing.
- Handlebars are more than fifteen inches above that portion of the seat occupied by the operator.

SUSPENSION

Swing arm, shocks, and springs. If a bike has adjustable suspension, the front and back adjustments should be about the same for best control. Advise customer if a significant difference is detected.



Suspension travel can be checked while sitting on the saddle. Press the front fork downward by placing most of your weight on it. The suspension should not bottom-out. The resistance to the downward pressure should be smooth, as should the rebound upward. The bike movement should settle down when it comes down from the first upward rebound; inspect the rear suspension the same way. When off the bike, check for leaks around hydraulic shocks and breaks in coil spring shocks. Inspect the swing arm for play with bike on center stand: gently push the rear wheel from side to side and see if it has play. Check proper alignment by seeing how the wheels track.

Fail suspension if:

- It bottoms out or does not settle down after the first upward rebound.

- A coil spring has a break or a shock absorber has a serious leak.
- The swing arm has play, or is damaged so as to adversely affect tracking.

TIRES

Check: Sidewall printed information, pressure, tread depth and tire condition.

Fail tires if:

- Treads are worn to less than 1/32-inch-deep or to where the wear indicators contact the road.



- There are bumps, bulges, cuts, snags, knots indicating partial failure or structure separation, cracks in excess of one inch in any direction and deep enough to expose the cords.
- A tire has a load capacity rating less than that recommended by the vehicle manufacturer, is on a rim of improper width, or can rub or touch other parts of the motorcycle when operated.
- A tire does not display the "DOT" symbol on the sidewall, is marked "Off-Highway Use only", "For Racing Use only", or other inappropriate restrictive use.



- A tire is not marked with the standard automotive size designation, does not have highway-type design treads, or the tire tread is equipped with metal studs.

WHEELS

Three basic types: pressed steel, spoke and “mag” casting. Wheels require little maintenance other than checking to see that they are “true” and undamaged. Mag wheels are generally lighter, stronger and more likely to stay “true.” Larger diameter wheels are more stable but they require more energy to move. Smaller diameter wheels are more responsive but less stable. Thus, more powerful bikes tend to have larger wheels.

Fail wheels for:

- Cracks, missing spokes, serious impact points such as bent spokes or a dent in the rim. A loose, bent or missing spoke can affect the trueness of the wheel. (A loose

spoke can be identified by comparing the sounds of spokes when tapped with a metal object).

Wheel alignment: Wheel alignment can be checked several ways. One quick method is to use a straight piece of wood. Place it against the sidewalls of the tires as close up to the axles as possible. If the wheels are aligned perfectly, the straight edge will contact the two tires at four points. One point on the sidewall in front of the front axle; one point on the sidewall to the rear of the front axle; one point on the sidewall to the front of the rear axle, and one point on the sidewall to the rear of the rear axle.

Another method is to make 3 parallel lines one inch apart on the floor. The lines should be twice the length of a moped. Center the wheels on the centerline and observe tracking of the rear wheel as the moped is moved forward on the centerline.

Fail alignment if:

- The rear wheel alignment of a two-wheel moped, in relation to tracking the front wheel, is misaligned by one inch or more, or not within the manufacturer's specifications.

Wheel bearings: Inspect the bushing or bearing for looseness by raising the wheel off the ground, grasping the wheel with one hand on either end of the diameter and gently push with one hand while pulling with the other. There should be no play.

Fail bearings if:

- They have side-to-side play. **Warn** owner if bearing seals have cracks or discoloration.

WINDSCREENS

These are not required, but if they are present, they must not interfere with the rider's forward vision.

Fail windscreen if:

- It has imperfections that interfere with the rider's forward vision to such extent that it is dangerous while operating the moped in the normal manner.
- It is not securely mounted.