

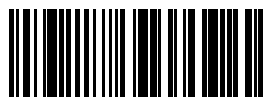
# TOURING MODELS

2022 HARLEY-DAVIDSON® OWNER'S MANUAL



Harley-Davidson Motor Company  
Service Communications  
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## LIMITED RADIO WARRANTY (AUSTRALIA)

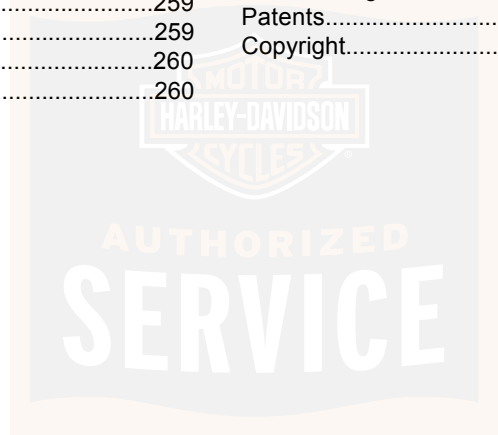
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# YOUR OWNER'S MANUAL

## We Care About You

Welcome to the Harley-Davidson Motorcycling Family! When enjoying your Harley-Davidson motorcycle, be sure to ride safely, respectfully and within the limits of the law and your abilities. Always wear a helmet, proper eyewear and protective clothing, and insist your passenger does too. Never ride while under the influence of alcohol or drugs. Know your Harley and read and understand your owner's manual from cover to cover.

This manual has been prepared to acquaint you with the operation, care and maintenance of your motorcycle and to provide you with important safety information. Follow these instructions carefully for maximum motorcycle performance and for your personal motorcycling safety and pleasure. Your Owner's Manual contains instructions for operation and minor maintenance. Major repairs are covered in the Harley-Davidson Service Manual. Such major repairs require the attention of a skilled technician and the use of special tools and equipment. Your Harley-Davidson dealer has the facilities, experience and Genuine Harley-Davidson parts necessary to properly render this valuable service. We recommend that any emission system maintenance be performed by an authorized Harley-Davidson dealer.

Attend a rider safety course. To enroll in a Harley-Davidson Riding Academy course, call 1-414-343-4056 (U.S.) or visit [www.harley-davidson.com/learntoride](http://www.harley-davidson.com/learntoride). In the United States, for information about Motorcycle Safety Foundation rider courses, call 1-800-446-9227 or visit [www.msf-usa.org](http://www.msf-usa.org).

## United States Owners

Your Harley-Davidson motorcycle conforms to all applicable U.S. Federal Motor Vehicle Safety Standards and U.S. Environmental Protection Agency regulations effective on the date of manufacture. Protect your privilege to ride by joining the American Motorcyclist Association. Visit [www.americanmotorcyclist.com](http://www.americanmotorcyclist.com) for more information.

Harley-Davidson reserves the right to change specifications, equipment or designs at any time without notice and without incurring obligation.

## CUSTOMER SERVICE ASSISTANCE

Most sales or service issues are resolved at the dealership.

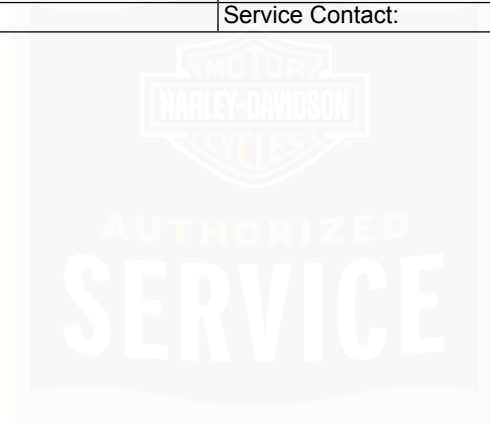
1. Discuss your problem with the appropriate personnel at the dealership in the Sales, Service or Parts area. If that proves unsuccessful, speak to the owner of the dealership or the general manager.

2. If you cannot resolve the issue with the dealership, contact the Harley-Davidson Customer Support Center. Harley-Davidson Motor Company Attention: Harley-Davidson Customer Support Center P.O. Box 653 Milwaukee, Wisconsin 53201 1-800-258-2464 (U.S. only) 1-414-343-4056

For customers outside the US, contact your local Harley-Davidson market office, call 1-414-343-4056 or visit [harley-davidson.com](http://harley-davidson.com).

**Table 1. Vehicle and Personal Data**

PERSONAL INFORMATION	DEALER INFORMATION
Date of Purchase:	
Name:	Name:
Address:	Address:
Address:	Address:
Vehicle Identification Number:	Sales Contact:
Key Number:	Service Contact:



## SAFETY DEFINITIONS

Statements in this manual preceded by the following words are of special significance:

### ▲ WARNING

**WARNING** indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury. (00119a)

### ▲ CAUTION

**CAUTION** indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury. (00139a)

### NOTICE

**NOTICE** indicates a potentially hazardous situation which, if not avoided, may result in property damage. (00140b)

### NOTE

*Refers to important information and is placed in italic type. It is recommended that you take special notice of these items.*

## SAFE OPERATING RULES

### ▲ WARNING

Motorcycles are different from other vehicles. They operate, steer, handle and brake differently. Unskilled or improper use could result in loss of control, death or serious injury.

- Take a rider training course.
- Read owner's manual before riding, adding accessories or servicing.
- Wear a helmet, eye protection and protective clothing.
- Never tow a trailer.

(00556d)

### ▲ WARNING

Operating a motorcycle requires physical stamina, sensory abilities, motor coordination, and mental alertness. It is the responsibility of the operator to perform a self-assessment to determine their ability to safely operate a motorcycle. Avoid operating a motorcycle:

- If you have physical, medical, or mental limitations.
- If you are under the influence of alcohol, drugs, or medications.

- **If you experience drowsiness, exhaustion, confusion, inability to concentrate, impaired reaction time, numbness or loss of sensation.**

**Failure to avoid these, or other conditions that impair your judgment or ability to operate a motorcycle can lead to an accident which could result in death or serious injury. (16804a)**

## **Harley-Davidson Motorcycles Are for On-Road Use Only**

This motorcycle is not equipped with a spark arrester. This motorcycle is designed to be used only on the road. Operation or off-road usage in some areas may be illegal. Obey local laws and regulations.

### **General**

#### **⚠ WARNING**

**Consult a Harley-Davidson dealer regarding any questions or problems that occur in the operation of your motorcycle. Failure to do so can aggravate an initial problem, cause costly repairs, cause an accident and could result in death or serious injury. (00020a)**

- Make sure all equipment required by federal, state and local law is installed and in good operating condition.

- Know and respect the rules of the road. Read the safety information that is provided by your state or regional traffic authority.
- In the United States, read the RIDING TIPS booklet that is provided with this owner's manual. Read the MOTORCYCLE HANDBOOK which is made available by your state or regional traffic authority.
- Protect your motorcycle against theft. Lock the front fork. Remove the key when parking your motorcycle.

#### **⚠ WARNING**

**Do not add sidecar to this motorcycle. Operating motorcycle with sidecar can cause loss of vehicle control, which could result in death or serious injury. (00590d)**

### **Operation**

Before operating your new motorcycle, it is your responsibility to read and follow the operating and maintenance instructions in this manual and follow these rules for your personal safety.

- Before starting the engine, review the BEFORE RIDING > PRE-RIDE CHECKLIST (Page 39).

**⚠ WARNING**

**Striking an object, such as a curb or pothole can cause internal tire damage. If an object is struck, have the tire inspected immediately inside and out by a Harley-Davidson dealer. A damaged tire can fail while riding and adversely affect stability and handling, which could result in death or serious injury. (00058b)**

**⚠ WARNING**

**Travel at speeds appropriate for road and conditions and never travel faster than posted speed limit. Excessive speed can cause loss of vehicle control, which could result in death or serious injury. (00008a)**

- Do not exceed the legal speed limit or drive too fast for existing conditions. Always reduce speed when poor driving conditions exist. High speed increases the influence of any other condition affecting stability and increases the possibility of loss of control.

- Pay strict attention to road surfaces and wind conditions and keep both hands on the handlebar grips at all times when riding the motorcycle. Any two wheeled vehicle may be subject to upsetting forces such as wind blasts from passing trucks, holes in the pavement, rough road surfaces, rider control error, etc. These forces may influence the handling characteristics of your motorcycle. If this happens, reduce speed and guide the motorcycle with a relaxed grip to a controlled condition. Do not brake abruptly or force the handlebar. This may aggravate an unstable condition.
- New riders should gain experience under various conditions while riding at moderate speeds.
- Operate your motorcycle defensively. In an accident, a motorcycle does not afford the same protection as an automobile.
- It is the rider's responsibility to instruct passengers on proper riding procedures.
- Do not allow other individuals to operate the motorcycle unless they are experienced, licensed riders and are thoroughly familiar with the operation of the motorcycle.

**⚠ WARNING**

**If Equipped: Front and/or rear guards are not intended to provide protection from bodily injury in a collision with another vehicle or any other object. (00022d)**

## Steering and Handling

### ⚠ WARNING

Do not operate vehicle with forks locked. Locking the forks restricts the vehicle's turning ability, which could result in death or serious injury. (00035a)

### ⚠ WARNING

Regularly inspect shock absorbers and front forks. Replace leaking, damaged or worn parts that can adversely affect stability and handling, which could result in death or serious injury. (00012a)

### ⚠ WARNING

Do not operate motorcycle with loose, worn or damaged steering or suspension systems. Contact a Harley-Davidson dealer for repairs. Loose, worn or damaged steering or suspension components can adversely affect stability and handling, which could result in death or serious injury. (00011a)

### ⚠ WARNING

Do not open storage compartments while riding. Distractions while riding can lead to loss of control, which could result in death or serious injury. (00082a)

### ⚠ WARNING

When riding on wet roads, brake efficiency and traction are greatly reduced. Failure to use care when braking, accelerating or turning on wet roads can cause loss of control, which could result in death or serious injury. (00041a)

## Accessories and Cargo

### ⚠ WARNING

Do not exceed the motorcycle's Gross Vehicle Weight Rating (GVWR) or Gross Axle Weight Rating (GAWR). Exceeding these weight ratings can lead to component failure and adversely affect stability, handling and performance, which could result in death or serious injury. (00016f)

- GVWR is the sum of the weight of the motorcycle, accessories and the maximum weight of the rider, passenger and cargo that can be safely carried.
- The GVWR is shown on the information label, located on the frame steering head or the frame downtube.
- GAWR is the maximum amount of weight that can be safely carried on each end of the motorcycle.

- For GVWR and GAWR, front and rear, see SPECIFICATIONS > SPECIFICATIONS (Page 29).

### **⚠ WARNING**

**Improper loading of cargo or installation of accessories can affect motorcycle stability and handling, which could result in death or serious injury.**

- **Keep cargo weight concentrated close to the motorcycle and as low as possible to minimize the change in the motorcycle's center of gravity.**
- **Distribute weight evenly on both sides of the vehicle.**
- **Do not load bulky items too far behind the rider or add weight to the handlebars or front forks.**
- **Do not exceed maximum load capacity stated on the label for bags, luggage, and racks, if equipped. Combined load of luggage rack and Tour-Pak must not exceed load capacity on the label within the Tour-Pak.**
- **Do not exceed the maximum load capacity stated within the media compartment, when indicated and if equipped.**
- **Check that cargo is secure. The cargo cannot shift while riding. Periodically recheck load.**
- **Close and lock luggage before riding or leaving the vehicle unattended.**

- **Accessories that change the operator's riding position may increase reaction time and affect handling of the motorcycle.**
- **Items with large surface areas, such as fairings, windshields, backrests and luggage racks (if equipped) can adversely affect stability and handling.**

(14717c)

## **Tires**

### **⚠ WARNING**

**Be sure tires are properly inflated, balanced, undamaged, and have adequate tread. Inspect your tires regularly and see a Harley-Davidson dealer for replacements. Riding with excessively worn, unbalanced, improperly inflated, overloaded or damaged tires can lead to tire failure and adversely affect stability and handling, which could result in death or serious injury. (00014b)**

### **⚠ WARNING**

Replace punctured or damaged tires. In some cases, small punctures in the tread area may be repaired from within the removed tire by a Harley-Davidson dealer. Speed should NOT exceed 80 km/h (50 mph) for the first 24 hours after repair, and the repaired tire should NEVER be used over 129 km/h (80 mph). Failure to follow this warning could lead to tire failure and result in death or serious injury. (00015b)

### **⚠ WARNING**

Do not use liquid tire balancers or sealants in aluminum wheels. Using liquid tire balancers or sealants can cause rapid corrosion of the rim surface, which could cause tire deflation. Tire deflation can cause loss of vehicle control, which could result in death or serious injury. (00631b)

- Tire pressure will vary with changes in ambient and tire temperature. Always maintain proper tire pressure as specified in OWNER MANUAL > SPECIFICATIONS (Page 29). Do not load tires beyond the GAWR specified in SPECIFICATIONS > SPECIFICATIONS (Page 29). Under-inflated, over-inflated or overloaded tires can fail.

## **Towing and Trailering**

### **⚠ WARNING**

Do not pull a trailer with a motorcycle. Pulling a trailer can cause tire overload, damage and failure, reduced braking performance, and adversely affect stability and handling, which could result in death or serious injury. (00018c)

### **⚠ WARNING**

Do not tow a disabled motorcycle. Towing can adversely affect stability and handling, which could result in death or serious injury. (00017a)

- Never tow a trailer.

## **Fuel and Exhaust**

### **⚠ WARNING**

Stop the engine when refueling or servicing the fuel system. Do not smoke or allow open flame or sparks near gasoline. Gasoline is extremely flammable and highly explosive, which could result in death or serious injury. (00002a)

### **⚠ WARNING**

**Avoid spills. Slowly open fuel filler cap. Do not fill above bottom of filler neck insert, leaving air space for fuel expansion. Secure filler cap after refueling. Gasoline is extremely flammable and highly explosive, which could result in death or serious injury. (00028b)**

- Refuel in a well-ventilated area with the engine off.
- Remove the fuel filler cap slowly.
- Do not fill fuel tank above the bottom of the filler neck insert. Leave air space to allow for fuel expansion.
- If fuel tank was completely drained, add at least 1 gal (3.79 L) of gas.

### **⚠ WARNING**

**Avoid contact with exhaust system and wear protective clothing that completely covers legs while riding. Exhaust pipes and mufflers get very hot when engine is running and remain too hot to touch, even after engine is turned off. Failure to wear protective clothing could result in burns or other serious injury. (00009a)**

### **⚠ WARNING**

**Do not run motorcycle in a closed garage or confined area. Inhaling motorcycle exhaust, which contains poisonous carbon monoxide gas, could result in death or serious injury. (00005a)**

### **⚠ WARNING**

**Engine exhaust from this product contains chemicals known to the State of California to cause cancer, and birth defects or other reproductive harm. (00004f)**

## **Brakes**

### **⚠ WARNING**

**Brakes are a critical safety component. Contact a Harley-Davidson dealer for brake repair or replacement. Improperly serviced brakes can adversely affect brake performance, which could result in death or serious injury. (00054a)**

### **⚠ WARNING**

**Apply front and rear brakes evenly. Favoring one brake accelerates wear and reduces braking efficiency. Operation with excessively worn brakes can lead to brake failure, which could result in death or serious injury. (00135a)**

### **⚠ WARNING**

DOT 4 brake fluid absorbs moisture from the atmosphere over time, changing the properties of the fluid. Check brake fluid moisture content at every service interval or annually (whichever comes first). Flush and replace the brake fluid every two years, or sooner if moisture content is 3% or greater. Failure to flush and replace fluid can adversely affect braking, which could result in death or serious injury. (06304b)

### **⚠ WARNING**

Contact with DOT 4 brake fluid can have serious health effects. Failure to wear proper skin and eye protection could result in death or serious injury.

- If inhaled: Keep calm, remove to fresh air, seek medical attention.
- If on skin: Remove contaminated clothing. Rinse skin immediately with plenty of water for 15-20 minutes. If irritation develops, seek medical attention.
- If in eyes: Wash affected eyes for at least 15 minutes under running water with eye lids held open. If irritation develops, seek medical attention.
- If swallowed: Rinse mouth and then drink plenty of water. Do not induce vomiting. Contact Poison Control. Immediate medical attention required.

- See Safety Data Sheet (SDS) for more details available at [sds.harley-davidson.com](https://sds.harley-davidson.com)

(00240e)

To ensure the brake system is performing to design, check the moisture content of the brake fluid at every service interval or at least annually using a DOT 4 brake fluid moisture tester (part number HD-48497-A or equivalent) following the instructions included with the tool. Flush DOT 4 fluid every 2 years or sooner if the brake system fluid test shows moisture content is 3% or greater.

Harley-Davidson recommends using Harley-Davidson Platinum Label DOT 4 Brake Fluid because of its superior moisture and corrosion inhibiting properties.

## **Battery**

### **⚠ WARNING**

Batteries, battery posts, terminals and related accessories contain lead and lead compounds, and other chemicals known to the State of California to cause cancer, and birth defects or other reproductive harm. Wash hands after handling. (00019e)

### **⚠ WARNING**

Batteries contain sulfuric acid, which could cause severe burns to eyes and skin. Wear a protective face shield, rubberized gloves and protective clothing when working with batteries. **KEEP BATTERIES AWAY FROM CHILDREN.** (00063a)

### **NOTICE**

It is possible to overload the vehicle's charging system by adding too many electrical accessories. If the combined electrical accessories operating at any one time consume more electrical current than the vehicle's charging system can produce, the electrical consumption can discharge the battery and cause damage to the vehicle's electrical system. (00211d)

### **⚠ WARNING**



**CONTAINS BUTTON OR COIN CELL BATTERY. KEEP OUT OF REACH OF CHILDREN.**

Ingestion can result in death or serious injury. Choking, chemical burns and perforation of soft tissue may result. Severe burns can occur within 2 hours of ingestion or placement in any part of the body. Seek medical attention immediately. (13105b)

## **Hazardous Materials**

### **⚠ CAUTION**

Prolonged or repeated contact with used motor oil may be harmful to skin and could cause skin cancer. Promptly wash affected areas with soap and water. (00358b)

## **Maintenance**

### **⚠ WARNING**

Perform the service and maintenance operations as indicated in the regular service interval table. Lack of regular maintenance at the recommended intervals can affect the safe operation of your motorcycle, which could result in death or serious injury. (00010a)

## NOTICE

**When lifting a motorcycle using a jack, be sure jack contacts both lower frame tubes where down tubes and lower frame tubes converge. Never lift by jacking on cross-members, oil pan, mounting brackets, components or housings. Failure to comply can cause serious damage resulting in the need to perform major repair work. (00586d)**

- A new motorcycle must be operated according to the special break-in procedure. See BEFORE RIDING > BREAK-IN RIDING RULES (Page 40).
- Proper care and maintenance, including tire pressure, tire condition, tread depth and proper adjustment to steering head bearings are important to stability and safe operation of the motorcycle. See SERVICE INTERVALS AND RECORDS > SERVICE RECORDS (Page 261).

## Parts and Accessories

### ⚠ WARNING

**Harley-Davidson parts and accessories are designed for Harley-Davidson motorcycles. Using non-Harley-Davidson parts or accessories can adversely affect performance, stability or handling, which could result in death or serious injury. (00001b)**

### ⚠ WARNING

**Use Harley-Davidson replacement fasteners. Aftermarket fasteners can adversely affect performance, which could result in death or serious injury. (00013a)**

- See your Harley-Davidson service manual for proper torque values.
- Aftermarket fasteners may not have the specific property requirements to perform properly.

### ⚠ WARNING

**See ACCESSORIES AND CARGO section within the SAFETY FIRST section in your owner's manual. Improper cargo loading or accessory installation can cause component failure and adversely affect stability, handling and performance, which could result in death or serious injury. (00021c)**

- Harley-Davidson Motor Company cannot test and make specific recommendations concerning every accessory or combination of accessories sold. Therefore, the rider must be responsible for safe operation of the motorcycle when installing accessories or carrying additional weight.
- Additional electrical equipment may overload the electrical system possibly resulting in electrical system and/or component failure.

## ANTI-LOCK BRAKE SYSTEM (ABS)

### ⚠ WARNING

**If ABS lamp continues flashing at speeds greater than 5 km/h (3 mph) or remains on continuously, the ABS is not operating. The standard brake system is operational, but wheel lock up can occur. Contact a Harley-Davidson Dealer to have ABS repaired. A locked wheel will skid and can cause loss of vehicle control, which could result in death or serious injury. (00361b)**

To operate motorcycles equipped with an anti-lock brake system, see OPERATION > BRAKE SYSTEM (Page 125) and OPERATION > CORNERING RIDER SAFETY ENHANCEMENTS (Page 129).

## RULES OF THE ROAD

- Always use your turn signals and exercise caution when passing other vehicles going in the same direction. Never pass going in the same direction at street intersections, on curves or when going up or down a hill.
- At street intersections, give the right-of-way. Do not presume you have the right-of-way, as the other driver may not know that it is your turn.
- Always signal when preparing to stop, turn or pass.
- Promptly obey all traffic signs, including those signs used for the control of traffic at intersections. Always obey traffic signs near schools and at railroad crossings.
- When intending to turn, signal at least 30.5 m (100 ft) before reaching the turning point. If turning across an intersection, move over to the centerline of the street (unless local rules require otherwise). Slow down when entering the intersection and turn carefully.
- Never anticipate a traffic light. When a change is indicated from GO to STOP (or STOP to GO), slow down and wait for the light to change. Never run through a yellow or red traffic light.
- While turning, watch for pedestrians, animals, as well as vehicles.
- Do not leave the curb or parking area without signaling. Make sure that your way is clear to enter moving traffic. A moving line of traffic always has the right-of-way.
- Make sure that your license plate is installed in the position specified by law. Make sure that your license plate is always clearly visible. Keep the license plate clean.
- Ride at a safe speed that is consistent with the type of highway you are on. Pay strict attention to whether the road is dry, oily, icy or wet.
- Watch for debris such as leaves or loose gravel.

- Weather and traffic conditions on the highway dictate adjusting your speed and driving habits accordingly.

## **NOISE CONTROL SYSTEM**

### **Tampering**

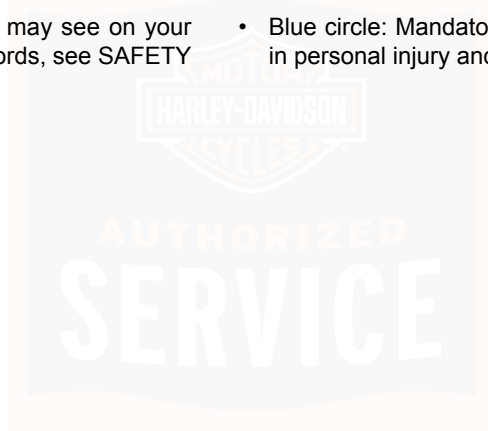
Removal or replacement of any noise control system component may be prohibited by law. This prohibition includes modifications made prior to vehicle sale or delivery to the ultimate purchaser. Use of a vehicle on which noise control system components have been removed or rendered inoperative may also be prohibited by law.

## **SAFETY SYMBOL DEFINITIONS**








These are some of the symbols that you may see on your motorcycle and may accompany safety words, see SAFETY

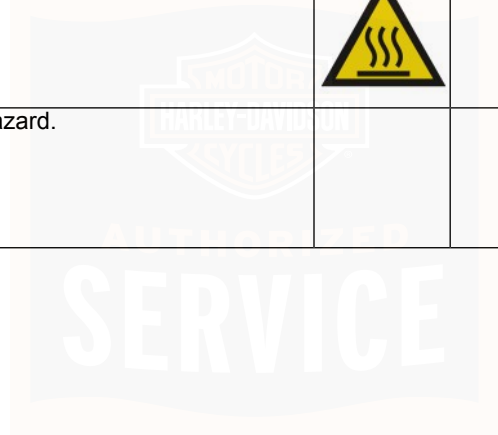
FIRST > SAFETY DEFINITIONS (Page 3). The symbols indicate potential safety hazards and avoidance actions to prevent a hazardous situation. The symbols may be present in manuals, instructions, on the motorcycle and/or Parts & Accessory product labels. Refer to SAFETY FIRST > SAFE OPERATING RULES (Page 3), the appropriate section in this manual and/or Parts & Accessory instructions for additional safety information.

- Yellow triangle: Safety symbol alerting to a hazard. Table 2
- Red circle with line: Prohibition symbol to avoid a situation which may lead to a hazard, personal injury and/or property damage. Table 3
- Blue circle: Mandatory action to avoid a hazard resulting in personal injury and/or property damage. Table 4












**Table 2. General Warning Symbols**










<b>SYMBOL</b>	<b>SYMBOL DEFINITION</b>	<b>SYMBOL</b>	<b>SYMBOL DEFINITION</b>
	General Warning indicating a hazard.		Explosive material hazard.
	Crash hazard.		Corrosive chemical burn hazard.
	Electric shock hazard.		Hot surface hazard.
	Battery charging hazard.		







**Table 3. General Prohibition Symbols**

SYMBOL	SYMBOL DEFINITION	SYMBOL	SYMBOL DEFINITION
	General prohibition sign to signify a prohibited action.		Do not expose to fire.
	Do not service without proper training or tools. Qualified technician only. Not user serviceable. No user replaceable parts. Refer service to qualified technician.		Do not perform action above indicated temperature.
	Do not touch.		Never tow a trailer.
	Keep away from open flame. Avoid smoking, flames, or sparks.		Do not use an extension cord.
	Do not add weight.		

**Table 4. General Mandatory Action Symbols**

<b>SYMBOL</b>	<b>SYMBOL DEFINITION</b>	<b>SYMBOL</b>	<b>SYMBOL DEFINITION</b>
	General mandatory action.		Wear proper protective riding apparel.
	Keep out of reach of children.		Wear proper hand protection.
	Refer to appropriate manual or instructions.		Wear proper Personal Protective Equipment (PPE).
	Take a rider training course.		Wear proper eye protection.
	Wear a helmet and eye protection.		

**Table 5. General Information Symbols**

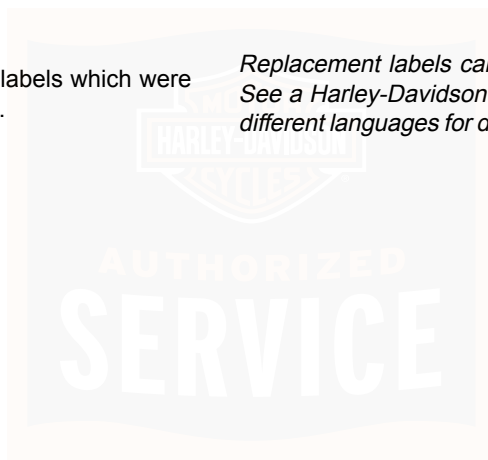
SYMBOL	SYMBOL DEFINITION	SYMBOL	SYMBOL DEFINITION
	Contains button or coin cell battery. Hazardous if swallowed.		Protect from rain or wet conditions.
	First responder cut loop. Emergency Personnel/First Responder use only.		Do not add more weight than specified.

## LABELS

See Figure 1 for safety and maintenance labels which were on the vehicle when new. Refer to Table 6.

### NOTE

*Replacement labels can be purchased for your motorcycle. See a Harley-Davidson dealer. Some labels are available in different languages for destinations outside the United States.*



## Figure 1. Labels

Table 6. Labels

ITEM	PART NO.	DESCRIPTION	LOCATION	TEXT
1	29108-08	General warning: Standard oval air cleaner	Top of air cleaner cover	<p>WARNING: Motorcycles are different from other vehicles. They operate, steer, handle and brake differently. Unskilled or improper use could result in loss of control, death or serious injury.</p> <ul style="list-style-type: none"> <li>• Take a rider training course.</li> <li>• Read Owner's Manual before riding, adding accessories or servicing.</li> <li>• Wear a helmet, eye protection and protective clothing.</li> <li>• Never tow a trailer.</li> </ul> <p>For a manual, find nearest dealer at 1-414-343-4056 or <a href="http://www.harley-davidson.com">www.harley-davidson.com</a></p>
	28012-09	General warning: Chrome exposed filter oval air cleaner		
	14000377	General warning: Black exposed filter oval air cleaner		
	14001624	General warning: Black cone air cleaner		
2	15368-01A	Battery warning	Under seat, behind fuel tank on main harness trough	<p>WARNING: A connected battery can cause a spark or motorcycle startup while servicing. Death or serious injury could occur.</p> <ul style="list-style-type: none"> <li>• Disconnect negative cable before servicing.</li> <li>• Keep cable away from terminal while servicing.</li> </ul>

**Table 6. Labels**

<b>ITEM</b>	<b>PART NO.</b>	<b>DESCRIPTION</b>	<b>LOCATION</b>	<b>TEXT</b>
3	90820-93D	Saddlebag load limits	Inside saddlebag	<p>WARNING: Too much weight in saddlebags can cause loss of control. Death or serious injury could occur.</p> <ul style="list-style-type: none"><li>• Do not put more than 15 pounds (6.8 kg) in each saddlebag on a 2008 and earlier vehicles.</li><li>• Do not put more than 20 pounds (9.1 kg) in each saddlebag on 2009 and later vehicles.</li><li>• Put equal weight in each saddlebag.</li><li>• See Accessories and Cargo section of Owner's Manual.</li></ul>
4	90821-74C	Tour-Pak load limits	Inside Tour-Pak lid	<p>WARNING: Too much weight in Tour-Pak® can cause loss of control. Death or serious injury could occur.</p> <ul style="list-style-type: none"><li>• Do not put more than 25 pounds (11.3 kg) in Tour-Pak® on 2008 and earlier motorcycles.</li><li>• Do not put more than 30 pounds (13.6 kg) in Tour-Pak® on 2009 and later motorcycles.</li><li>• See Accessories and Cargo section of Owner's Manual for more information.</li></ul>

## VEHICLE IDENTIFICATION NUMBER (VIN)

### General

See Figure 3. A unique 17-digit serial or Vehicle Identification Number (VIN) is assigned to each motorcycle. Refer to Table 7.

### Location

See Figure 2. The full 17-digit VIN is stamped on the right side of the frame near the steering head. In some destinations, a printed VIN label is also attached on the front downtube.

### Abbreviated VIN

An abbreviated VIN showing the vehicle model, engine type, model year, and sequential number is stamped on the left side of the crankcase between the engine cylinders.

#### NOTE

*Always give the full 17-digit Vehicle Identification Number when ordering parts or making any inquiry about your motorcycle.*

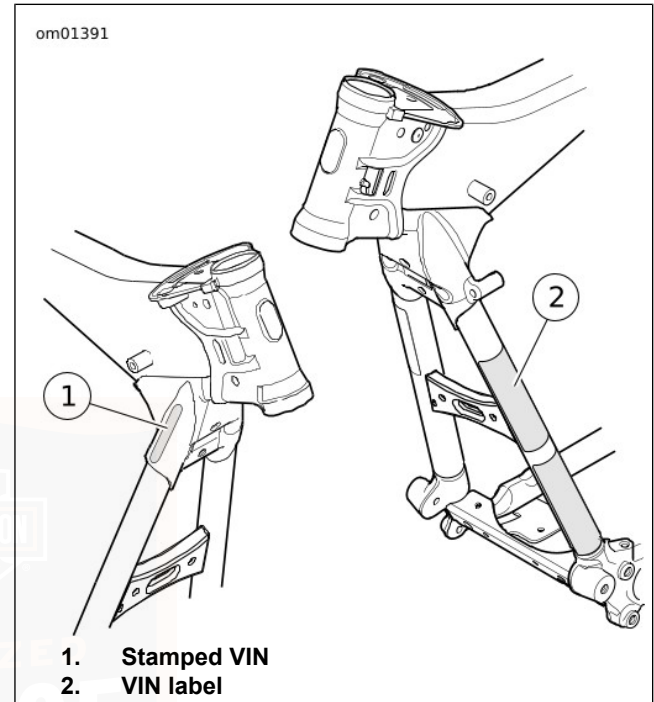
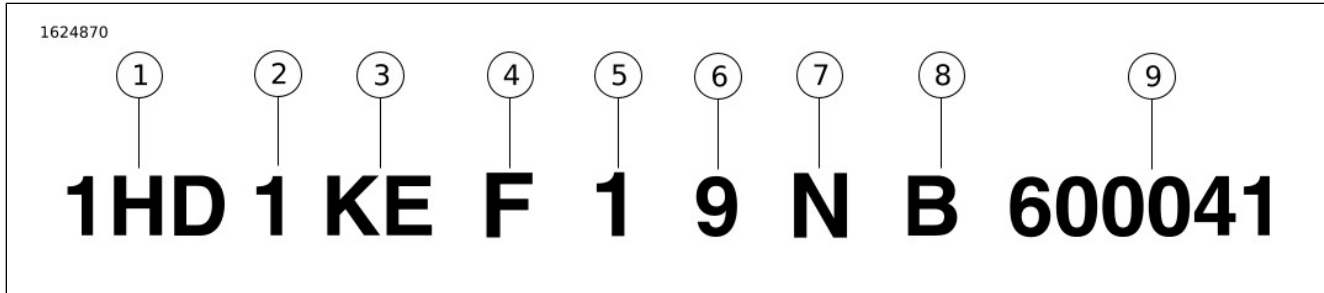


Figure 2. VIN Locations



**Figure 3. Typical Harley-Davidson VIN: 2022 Harley-Davidson Touring Models**

**Table 7. Harley-Davidson VIN Breakdown: 2022 Touring Models**

POSITION	DESCRIPTION	POSSIBLE VALUES
1	World manufacturer identifier	1HD=Originally manufactured in the United States 5HD=Originally manufactured in the United States or Thailand for sale outside of the United States 932=Originally manufactured in Brazil MLY=Originally manufactured in Thailand
2	Motorcycle type	1=Heavyweight motorcycle (901 cm <sup>3</sup> or larger)
3	Model	See VIN model table
4	Engine type	C=Milwaukee-Eight™ 107 Engine, 1745 cm <sup>3</sup> F=Twin-Cooled™ Milwaukee-Eight™ 114 Engine, 1868 cm <sup>3</sup> P=Milwaukee-Eight™ 114 Engine, 1868 cm <sup>3</sup> L=Milwaukee-Eight™ 117 Engine, 1923 cm <sup>3</sup>

**Table 7. Harley-Davidson VIN Breakdown: 2022 Touring Models**

<b>POSITION</b>	<b>DESCRIPTION</b>	<b>POSSIBLE VALUES</b>
5	Calibration/configuration, introduction	1=Domestic (DOM) 2=California (CAL) 3=Canada (CAN) 4=ENG/EN2/HDI/HD2/HD4 5=Japan (JPN) 6=Australia (AUS) 7=Brazil (BRZ) 8=Asia Pacific (APC) 9=IND/IN2 0=ASEAN (AZN) A=China (CHN) G=HD3
6	VIN check digit	Can be 0-9 or X
7	Model year	N=2022
8	Assembly plant	B=York, PA U.S.A. D=H-D Brazil-Manaus, Brazil (CKD) S=Tasit, Pluagdang, Rayong, Thailand
9	Sequential number	Varies



**Table 8. VIN Model Codes: Touring Models**

CODE	MODEL	CODE	MODEL
AB	Street Glide® ST (FLHXST)	KH	Road Glide® (FLTRX)
AC	Road Glide® ST (FLTRXST)	KN	Electra Glide® Ultra Limited Shrine (FLHTK-SHRINE)
FB	Road King® (FLHR)	KR	Street Glide® Special (FLHXS)
FV	Electra Glide® Standard (FLHT)	KT	Road Glide® Special (FLTRXS)
KB	Street Glide® (FLHX)	KV	Road King® Special (FLHRXS)
KE	Electra Glide® Ultra Limited (FLHTK)	KZ	Road Glide® Limited (FLTRK)

## MODELS AND FEATURES

Some models, features or configurations shown in this manual may not be available in all markets.

## PRIMARY CONTROLS AND SERVICE COMPONENTS

Familiarize yourself with the location of all the controls and service components on your motorcycle.

### NOTE

*Illustrations are for general reference only. Controls and service components shown are general locations and*

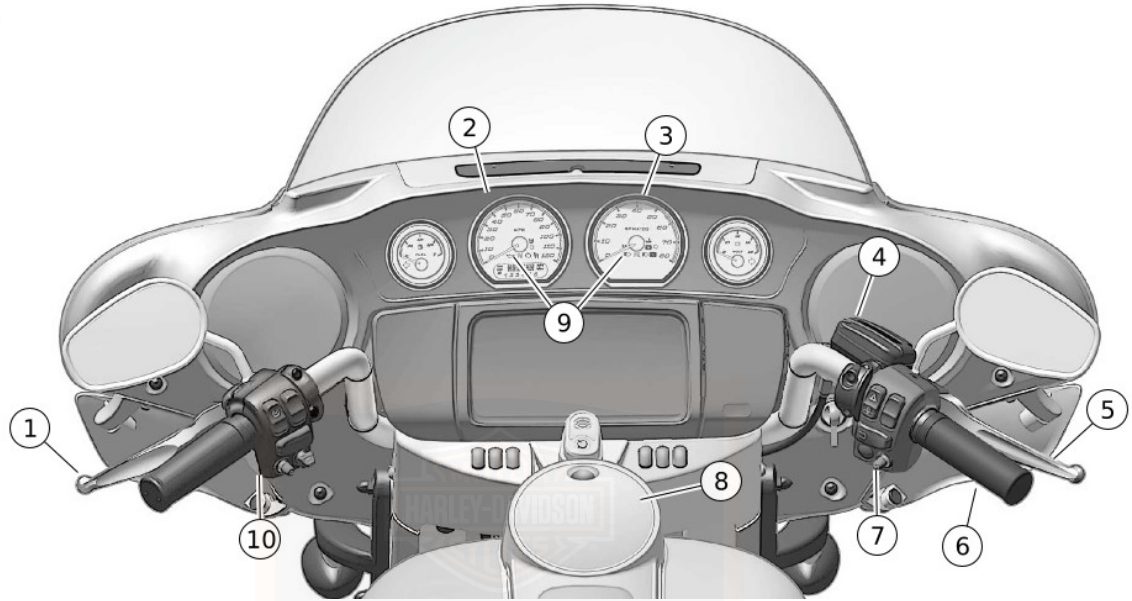
*representations that do not show a specific model of motorcycle.*

*Harley-Davidson reserves the right to change specifications, equipment or designs at any time without notice and without incurring obligation.*

See Figure 4 for rider controls and service components accessible when seated.

See Figure 5 for rider controls and service components accessible from the right.

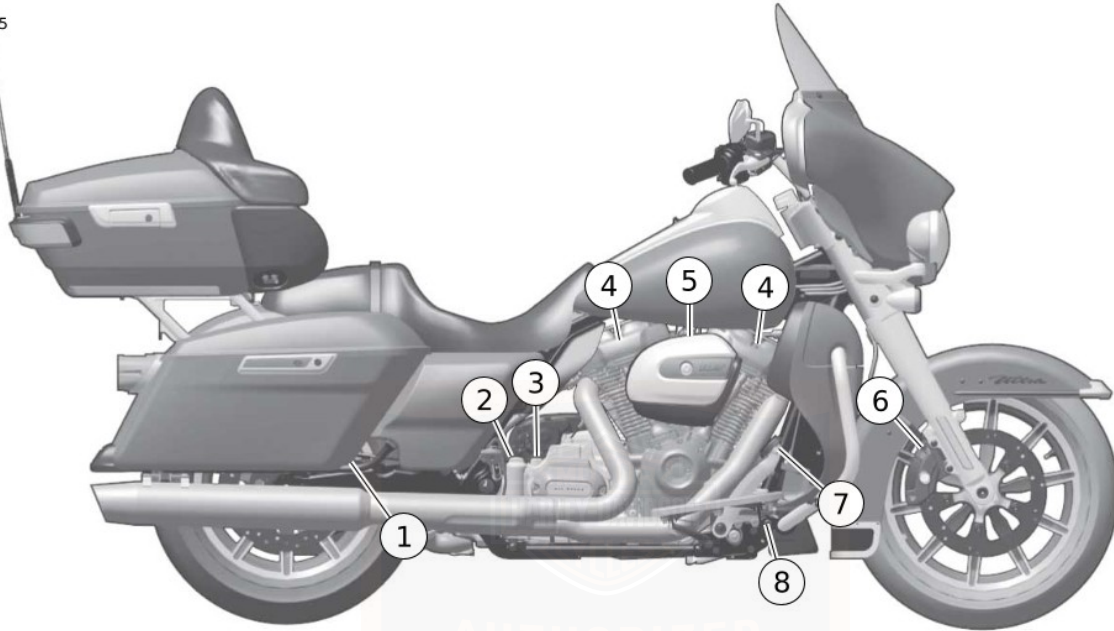
See Figure 6 for rider controls and service components accessible from the left.



- |                                |                              |
|--------------------------------|------------------------------|
| 1. Clutch hand lever           | 6. Throttle twist grip       |
| 2. Speedometer/odometer        | 7. Right hand control module |
| 3. Tachometer                  | 8. Fuel filler door          |
| 4. Front brake fluid reservoir | 9. Indicator lamps           |
| 5. Front brake lever           | 10. Left hand control module |

Figure 4. Controls and Service Components (Typical)

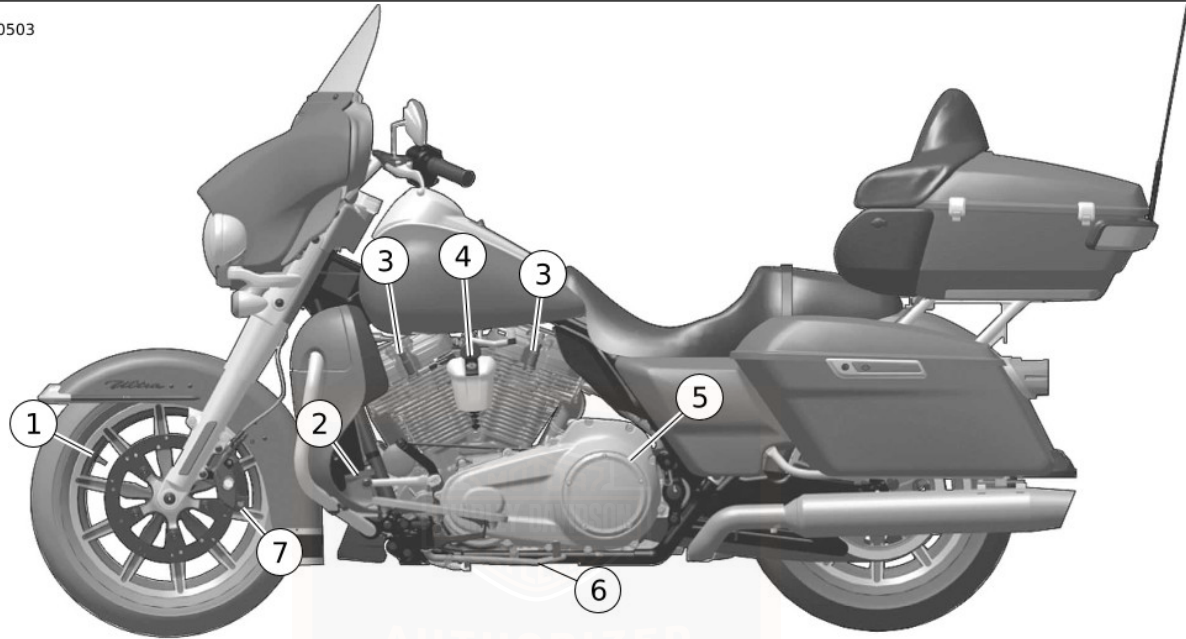
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- |                             |                               |
|-----------------------------|-------------------------------|
| 1. Rear brake caliper       | 5. Air cleaner                |
| 2. Oil filler cap/dipstick  | 6. Front brake caliper        |
| 3. Transmission filler plug | 7. Rear brake pedal           |
| 4. Spark plug               | 8. Rear brake fluid reservoir |

**Figure 5. Controls and Service Components (typical)**

1430503



- 1. Air pressure valve
- 2. Gear shift lever
- 3. Spark plug
- 4. Horn

- 5. Clutch cover
- 6. Jiffy stand
- 7. Front brake caliper

**Figure 6. Controls and Service Components (typical)**

# NOTES

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## SPECIFICATIONS

### NOTE

- Specifications in this publication may not match those of official certification in some markets due to timing of publication printing, variance in testing methods, and/or motorcycle differences. Customers seeking officially recognized regulatory specifications for their motorcycle should refer to certification documents and/or contact their respective dealer or distributor.

- Harley-Davidson reserves the right to change specifications, equipment or designs at any time without notice and without incurring obligation.

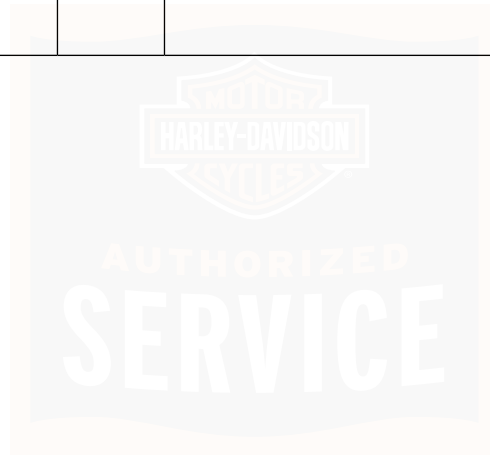
## Tires

Table 9. Specified Tires

MODEL	MOUNT	SIZE	SPECIFIED TIRE	PRESSURE (COLD 20 °C (68 °F))	
				psi	kPa
Electra Glide® Standard (FLHT)	front	17 in	Dunlop D408F 130/80B17 65H BW	36	248
Electra Glide® Ultra Limited (FLHTK) Road Glide® Limited (FLTRK) Road King® (FLHR)	front	18 in	Dunlop D408F 130/70B18 63H BW	36	248

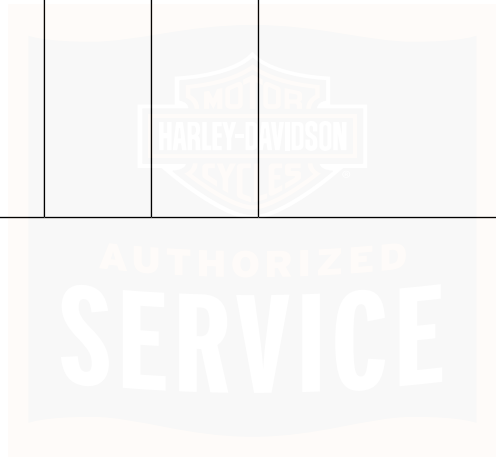
**Table 9. Specified Tires**

MODEL	MOUNT	SIZE	SPECIFIED TIRE	PRESSURE (COLD 20 °C (68 °F))	
				psi	kPa
Road Glide® (FLTRX) Road Glide® Special (FLTRXS) Road Glide® ST (FLTRXST) Road King® Special (FLHRXS) Street Glide® (FLHX) Street Glide® Special (FLHXS) Street Glide® ST (FLHXST)	front	19 in	Dunlop D408F 130/60B19 61H BW	36	248



**Table 9. Specified Tires**

MODEL	MOUNT	SIZE	SPECIFIED TIRE	PRESSURE (COLD 20 °C (68 °F))	
				psi	kPa
Electra Glide® Standard (FLHT)	rear	16 in	Dunlop D407T 180/65B16 81H BW	40	276
Electra Glide® Ultra Limited (FLHTK)	rear	18 in	Dunlop D407T 180/55B18 80H BW	40	276
Road Glide® (FLTRX)					
Road Glide® Limited (FLTRK)					
Road Glide® Special (FLTRXS)					
Road Glide® ST (FLTRXST)					
Road King® (FLHR)					
Road King® Special (FLHRXS)					
Street Glide® (FLHX)					
Street Glide® Special (FLHXS)					
Street Glide® ST (FLHXST)					



**▲ WARNING**

Harley-Davidson recommends the use of its specified tires. Harley-Davidson vehicles are not designed for operation with non-specified tires, including snow, moped and other special-use tires. Use of non-specified tires can adversely affect stability, handling or braking and lead to loss of vehicle control, which could result in death or serious injury. (00024d)

## Weights and Dimensions

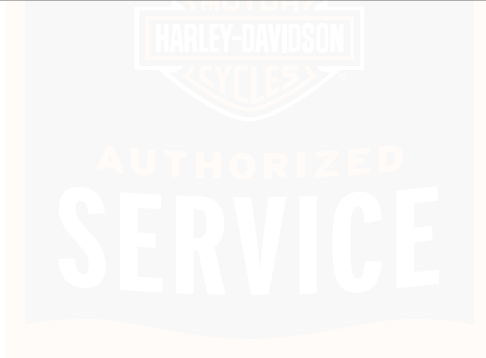
**Table 10. Weights: Electra Glide Standard (FLHT), Electra Glide Ultra Limited (FLHTK), Road Glide Limited (FLTRK), Street Glide ST (FLHXST), Road Glide ST (FLTRXST)**

ITEM	Electra Glide® Standard (FLHT)		Electra Glide® Ultra Limited (FLHTK)		Road Glide® Limited (FLTRK)		Street Glide® ST (FLHXST)		Road Glide® ST (FLTRXST)	
	lb	kg	lb	kg	lb	kg	lb	kg	lb	kg
Running weight <sup>(1)</sup>	820	372	917	416	932	423	814	369	842	382
Maximum added weight allowed <sup>(2)</sup>	540	245	443	201	428	194	546	248	518	235
GVWR	1360	617	1360	617	1360	617	1360	617	1360	617
GAWR front	500	227	500	227	500	227	500	227	500	227
GAWR rear	927	420	927	420	927	420	927	420	927	420
<i>(1) The total weight of the motorcycle as delivered with all oil/fluids and approximately 90% of fuel.</i>										
<i>(2) The total weight of accessories, cargo, riding gear, passenger and rider must not exceed this weight.</i>										

**Table 11. Weights: Road King (FLHR), Road King Special (FLHRXS), Street Glide (FLHX), Street Glide Special (FLHXS), Road Glide (FLTRX), Road Glide Special (FLTRXS)**

ITEM	Road King® (FLHR)		Road King® Special (FLHRXS)		Street Glide® (FLHX)		Street Glide® Special (FLHXS)		Road Glide® (FLTRX)		Road Glide® Special (FLTRXS)	
	lb	kg	lb	kg	lb	kg	lb	kg	lb	kg	lb	kg
Running weight <sup>(1)</sup>	828	375	807	366	829	376	827	375	855	388	853	387
Maximum added weight allowed <sup>(2)</sup>	532	247	553	251	531	242	533	242	505	229	507	230
GVWR	1360	617	1360	617	1360	617	1360	617	1360	617	1360	617
GAWR front	500	227	500	227	500	227	500	227	500	227	500	227
GAWR rear	927	420	927	420	927	420	927	420	927	420	927	420

(1) The total weight of the motorcycle as delivered with all oil/fluids and approximately 90% of fuel.  
(2) The total weight of accessories, cargo, riding gear, passenger and rider must not exceed this weight.



**Table 12. Dimensions: Electra Glide Standard (FLHT), Electra Glide Ultra Limited (FLHTK), Road Glide Limited (FLTRK), Street Glide ST (FLHXST), Road Glide ST (FLTRXST)**

ITEM	Electra Glide® Standard (FLHT)		Electra Glide® Ultra Limited (FLHTK)		Road Glide® Limited (FLTRK)		Street Glide® ST (FLHXST)		Road Glide® ST (FLTRXST)	
	in	mm	in	mm	in	mm	in	mm	in	mm
Length	94.5	2400	102.3	2600	102.2	2595	94.5	2400	94.7	2405
Overall Width	38.0	965	37.8	960	36.6	930	37.8	960	37.6	955
Overall height	55.3	1405	56.7	1440	56.1	1425	53.1	1350	52.2	1325
Wheel base	64.0	1625	64.0	1625	64.0	1625	64.0	1625	64.0	1625
Road clearance	4.7	120	5.3	135	5.1	130	5.3	135	5.5	140
Seat height <sup>(1)</sup>	26.1	663	27.5	699	27.2	690	26.7	678	26.7	678

*(1) With 81.7 kg (180 lb) rider on seat*

**Table 13. Dimensions: Road King (FLHR), Road King Special (FLHRXS), Street Glide (FLHX), Street Glide Special (FLHXS), Road Glide (FLTRX), Road Glide Special (FLTRXS)**

ITEM	Road King® (FLHR)		Road King® Special (FLHRXS)		Street Glide® (FLHX)		Street Glide® Special (FLHXS)		Road Glide® (FLTRX)		Road Glide® Special (FLTRXS)	
	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm
Length	96.5	2450	95.3	2420	96.5	2450	95.5	2425	95.7	2430	95.7	2430
Overall width	37.8	960	39.0	990	37.8	960	37.8	960	38.6	980	39.0	990
Overall height	56.3	1430	45.3	1150	53.1	1350	52.6	1335	51.6	1310	52.2	1325
Wheel base	64.0	1625	64.0	1625	64.0	1625	64.0	1625	64.0	1625	64.0	1625

**Table 13. Dimensions: Road King (FLHR), Road King Special (FLHRXS), Street Glide (FLHX), Street Glide Special (FLHXS), Road Glide (FLTRX), Road Glide Special (FLTRXS)**

ITEM	Road King® (FLHR)		Road King® Special (FLHRXS)		Street Glide® (FLHX)		Street Glide® Special (FLHXS)		Road Glide® (FLTRX)		Road Glide® Special (FLTRXS)	
	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm
Road clearance	5.3	135	4.9	125	5.3	135	4.9	125	5.5	140	5.1	130
Saddle height <sup>(1)</sup>	26.3	667	26.4	671	26.1	664	26.1	664	25.9	658	26.1	663

(1) With 81.7 kg (180 lb) rider on seat

## Capacities

**Table 14. Capacities**

ITEM	U.S.	METRIC
Fuel tank (total)	6.0 gal	22.7 L
Low fuel warning light on (approximate)	1.0 gal	3.8 L
Engine oil capacity with filter *		
Twin-cooled (new system)	5.0 qt	4.7 L
Air-cooled (new system)	5.2 qt	4.9 L
Service oil change (all)	4.75 qt	4.5 L
Transmission ** (approximate)	32 oz	0.95 L
Primary chaincase (dry fill; approximate) ***	34 oz	1.0 L

**Table 14. Capacities**

ITEM	U.S.	METRIC
Coolant, Twin-cooled models (approximate)	0.8 qt	0.76 L
* When refilling, initially add 3.8 L (4.0 qt). Add more as needed to bring level within specification.		
** When refilling, initially add 0.83 L (28 fl oz) Add more as needed to bring level within specification.		
*** Amount is approximate. Fill to bottom of pressure plate OD with vehicle upright.		

## Engine and Transmission

**Table 15. Engine: Milwaukee-Eight™ 107 Engine**

ITEM	SPECIFICATION	
Number of cylinders	2	
Type	4-cycle, 45 degree V-Type, air-cooled Single camshaft Single balance shaft	
Compression ratio	10.0:1	
Bore	3.937 in	100 mm
Stroke	4.375 in	111.1 mm
Displacement	107 in <sup>3</sup>	1746 cm <sup>3</sup>
Fuel requirement	Premium unleaded	
Lubrication system	Pressurized, dry sump with oil cooler*	
* Fan cooled on some models.		

**Table 16. Engine: Milwaukee-Eight™ 114 Engine**

ITEM	SPECIFICATION	
Number of cylinders	2	
Type	4-cycle, 45 degree V-Type, air-cooled Single camshaft single balance shaft	
Compression ratio	10.5:1	

**Table 16. Engine: Milwaukee-Eight™ 114 Engine**

ITEM	SPECIFICATION	
Bore	4.016 in	102 mm
Stroke	4.500 in	114.3 mm
Displacement	114 in <sup>3</sup>	1868 cm <sup>3</sup>
Fuel requirement	Premium unleaded	
Lubrication system	Pressurized, dry sump with oil cooler	

**Table 17. Engine: Oil-Cooled™ Milwaukee-Eight™ 117 Engine**

ITEM	SPECIFICATION	
Number of cylinders	2	
Type	4-cycle, 45 degree V-type Oil-cooled, Single camshaft Single balance shaft	
Compression ratio	10.2:1	
Bore	4.075 in	103.5 mm
Stroke	4.500 in	114.3 mm
Displacement	117 in <sup>3</sup>	1923 cm <sup>3</sup>
Fuel requirement	Premium unleaded	
Lubrication system	Pressurized, dry sump with oil cooler	

**Table 18. Engine: Twin Cooled™ Milwaukee-Eight™ 114 Engine**

ITEM	SPECIFICATION	
Number of cylinders	2	
Type	4-cycle, 45 degree V-Type, Twin-Cooled Single camshaft Single balance shaft	
Compression ratio	10.5:1	
Bore	4.016 in	102 mm
Stroke	4.500 in	114.3 mm
Displacement	114 in <sup>3</sup>	1868 cm <sup>3</sup>
Fuel requirement	Premium unleaded	
Lubrication system	Pressurized, dry sump	
Cooling system	Liquid-cooled cylinder heads with lower fairing-mounted radiators and electric pump	

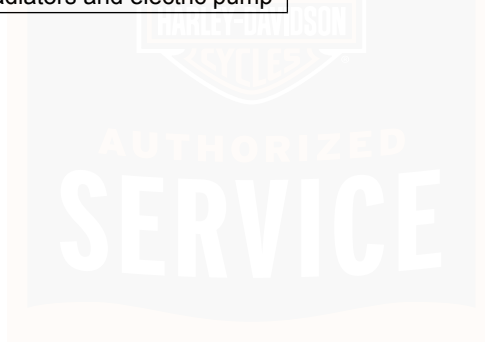
**Table 19. Transmission**

TRANSMISSION	SPECIFICATION
Type	Constant mesh, foot shift
Speeds	6 forward

## Electrical

**Table 20. Electrical**

ITEM	SPECIFICATION	
Ignition timing	Not adjustable	
Battery	12 V, 28 Ah, 405 CCA sealed and maintenance free	
Charging system	46-50 A maximum output	
Spark plug size	10 mm	
Spark plug gap	0.031-0.035 in	0.80-0.90 mm
Spark plug torque	84-108 in-lbs	9.5-12.2 Nm



# NOTES

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## REMOVING MOTORCYCLE FROM STORAGE

1. Charge and install the battery. See SERVICE PROCEDURES > BATTERY MAINTENANCE (Page 197).
2. Inspect spark plugs. See MAINTENANCE AND LUBRICATION > SPARK PLUGS (Page 189).
3. Inspect air filter and replace if necessary. See MAINTENANCE AND LUBRICATION > INSPECTING AIR FILTER (Page 190).
4. Inspect drive belt and sprocket. See MAINTENANCE AND LUBRICATION > CHECK DRIVE BELT DEFLECTION (Page 180).
5. Perform the items in the BEFORE RIDING > PRE-RIDE CHECKLIST (Page 39).

## PRE-RIDE CHECKLIST

1. Check the amount of fuel in the tank. Add fuel if required. See BEFORE RIDING > FILLING THE FUEL TANK (Page 41).
2. Adjust mirrors to proper riding positions. See BEFORE RIDING > ADJUSTING MIRRORS (Page 55).
3. Check the engine oil level. See MAINTENANCE AND LUBRICATION > CHECK ENGINE OIL LEVEL (Page 166).

4. Check the coolant level (if equipped). See MAINTENANCE AND LUBRICATION > COOLING SYSTEM (Page 177).
5. Check brake fluid level. See MAINTENANCE AND LUBRICATION > BRAKES (Page 185).
6. Inspect brake pads and discs for wear. See MAINTENANCE AND LUBRICATION > BRAKES (Page 185).
7. Check the hand and foot controls to be sure they are operating properly. Operate the front and rear brakes, throttle, clutch and shifter. See OWNER MANUAL > OPERATION (Page 75).
8. Inspect brake lines for wear or damage.
9. Check steering for smoothness by turning the handlebar through the full operating range.

### **▲ WARNING**

**Be sure tires are properly inflated, balanced, undamaged, and have adequate tread. Inspect your tires regularly and see a Harley-Davidson dealer for replacements. Riding with excessively worn, unbalanced, improperly inflated, overloaded or damaged tires can lead to tire failure and adversely affect stability and handling, which could result in death or serious injury. (00014b)**

10. Check tire condition, pressure and motorcycle loading. Refer to BEFORE RIDING > CHECKING TIRE PRESSURE AND INSPECTING TIRES (Page 49) for correct tire inflation pressure and motorcycle weight allowances.
11. Check rear shock settings. Adjust if necessary. See BEFORE RIDING > ADJUSTING SHOCK ABSORBERS (Page 56).
12. Check for any fuel, oil or hydraulic fluid leaks.
13. Check drive belt for wear or damage.

### **▲ WARNING**

**Be sure headlamp, tail and stop lamp and turn signals are operating properly before riding. Poor visibility of rider to other motorists can result in death or serious injury. (00478b)**

14. Check all electrical equipment and switches including the stop lamp, turn signals and horn for proper operation.
15. Service your motorcycle as necessary.

## **BREAK-IN RIDING RULES**

### **The First 500 Miles (800 Kilometers)**

The sound design, quality materials, and workmanship that are built into your new Harley-Davidson will give you optimum performance right from the start.

To allow your engine to wear-in its critical parts, we recommend that you observe the riding rules provided below for the first 800 km (500 mi).

1. During the first 80 km (50 mi) of riding, keep the engine speed below 3000 rpm in any gear. Do not lug the engine by running or accelerating at very low rpm, or by running at high rpm longer than needed for shifting or passing.

2. Up to 800 km (500 mi), vary the engine speed and avoid operating at any steady engine speed for long periods. Engine speed up to 3500 rpm in any gear is permissible.
3. Drive slowly and avoid fast starts at wide open throttle until the engine has warmed up.
4. Avoid lugging the engine by not running the engine at very low speeds in higher gears.
5. Avoid hard braking. Break-in new brakes with moderate use for the first 160 km (100 mi).

## FILLING THE FUEL TANK

See SAFETY FIRST > SAFE OPERATING RULES (Page 3) and review the following safety procedures.

### ⚠ WARNING

**Avoid spills. Slowly open fuel filler cap. Do not fill above bottom of filler neck insert, leaving air space for fuel expansion. Secure filler cap after refueling. Gasoline is extremely flammable and highly explosive, which could result in death or serious injury. (00028b)**

### ⚠ WARNING

**Do not store motorcycle with gasoline in tank within the home or garage where open flames, pilot lights, sparks or electric motors are present. Gasoline is extremely flammable and highly explosive, which could result in death or serious injury. (00003a)**

### ⚠ WARNING

**Do not use aftermarket fuel caps. Aftermarket fuel caps may fit improperly and leak, which could lead to death or serious injury. See a Harley-Davidson dealer for approved fuel caps. (00034a)**

### NOTICE

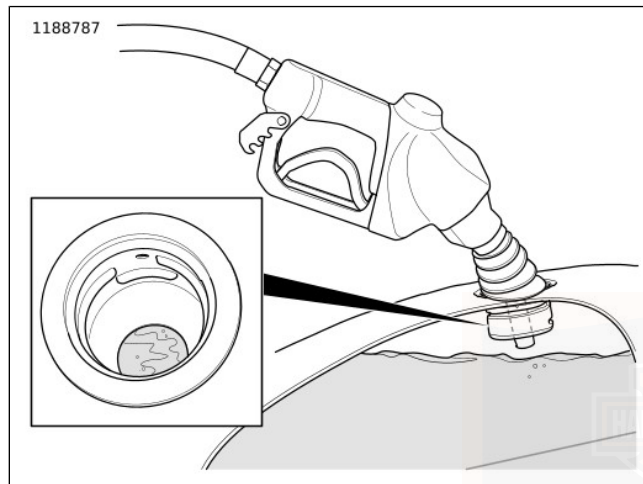
**Do not spill fuel onto the motorcycle while refueling. Immediately wipe up fuel spills on your motorcycle. Fuel can cause damage to cosmetic surfaces. (00147b)**

### NOTICE

**Use only unleaded fuel in catalytic converter-equipped motorcycles. Using leaded fuel will damage the emission control system. (00150c)**

See Figure 7. Do not overfill the fuel tank. Insert the pump nozzle into the filler hole. Do not fill the tank beyond the bottom of the filler neck. A warm engine, the sun or extreme

temperatures can cause the fuel to expand. Fuel can spill out of the tank and damage the finish. See SAFETY FIRST > SAFE OPERATING RULES (Page 3).



**Figure 7. Fuel Level below Filler Neck**

## Side Fill

See Figure 8. The fuel filler cap is on the right side of the fuel tank. Some vehicles have a locking fuel cap.

The cap on the left side is the fuel gauge. The fuel gauge is not removable.

42 Before Riding

## Center Fill

The fuel filler cap is beneath a pushbutton or locking door on the fuel tank.

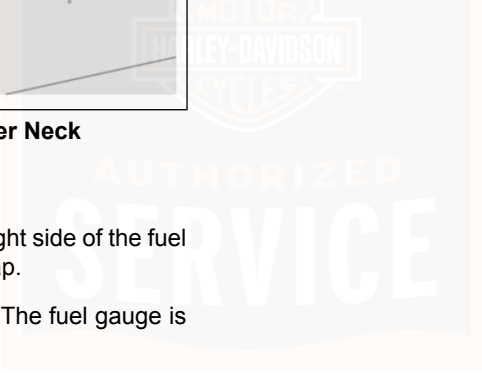
**Pushbutton fuel door:** See Figure 9. Push button to release the door.

**Locking fuel door:** See Figure 10. Unlock fuel door with the ignition key. Lock fuel door by removing key and closing fuel door.

## Fuel Filler Cap Operation

**Remove:** Turn fuel filler cap counterclockwise to remove.

**Install:** Turn fuel filler cap clockwise until it clicks. The ratchet action of the cap prevents over-tightening.



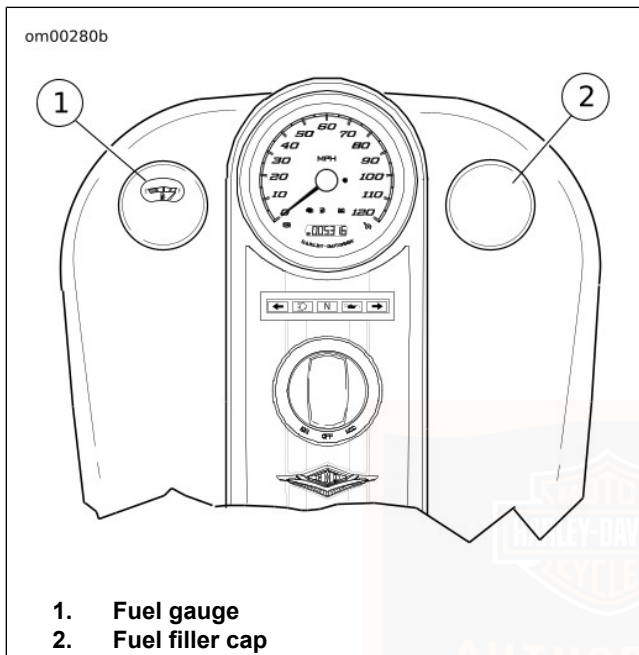


Figure 8. Fuel Tank: Side Fill (Typical)

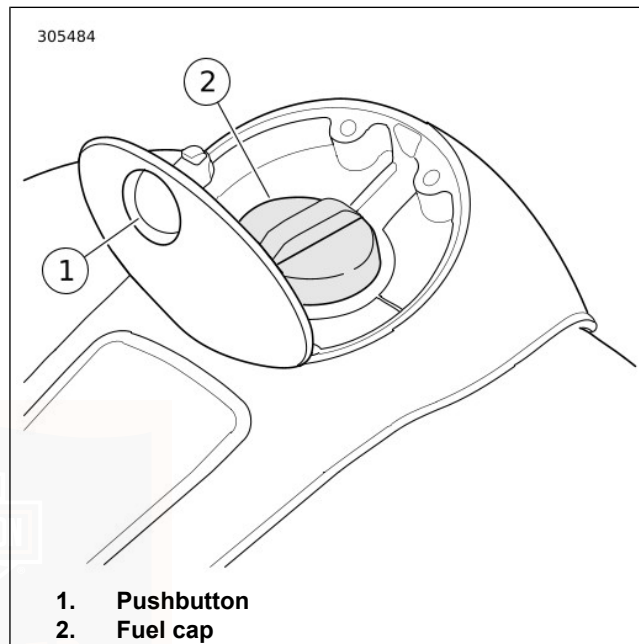


Figure 9. Pushbutton Fuel Door

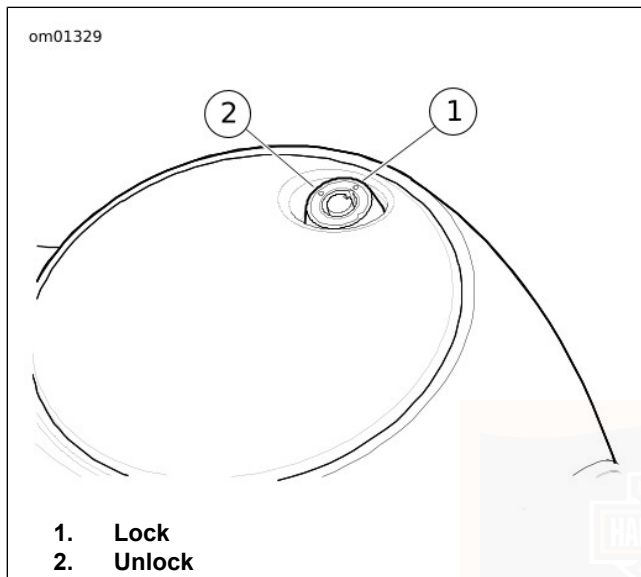


Figure 10. Locking Fuel Door

## FUEL SYSTEM INFORMATION

### Gasoline

Your motorcycle was designed to get the best performance and efficiency using unleaded gasoline. Most gasoline is blended with alcohol and/or ether to create oxygenated blends.

The type and amount of alcohol or ether added to the fuel is important.

#### NOTICE

**Do not use gasoline that contains methanol. Doing so can result in fuel system component failure, engine damage and/or equipment malfunction. (00148a)**

#### NOTICE

**Use only unleaded fuel in catalytic converter-equipped motorcycles. Using leaded fuel will damage the emission control system. (00150c)**

- ETHANOL fuel is a mixture of ethanol (grain alcohol) and unleaded gasoline and can have an impact on fuel mileage.
- REFORMULATED OR OXYGENATED GASOLINES (RFG) describes gasoline blends that are specifically designed to burn cleaner than other types of gasoline. This results in fewer tailpipe emissions. They are also formulated to reduce evaporative losses to the environment. Reformulated gasolines use additives to oxygenate the gas. Your motorcycle will run normally using this type of fuel. Harley-Davidson recommends using it whenever possible as an aid to cleaner air in our environment.




- Some gasoline blends might adversely affect starting, driveability or fuel efficiency. If any of these problems are experienced, try a different brand of gasoline or gasoline with a higher octane blend.

**Table 21. Octane Rating**

<b>SPECIFICATION</b>	<b>RATING</b>
Pump Octane (R+M)/2	91 (95 RON)



**Table 22. Fuel Specification**

<b>Common Identifier</b>	<b>Specification</b>	<b>Rating</b>
MTBE	Methyl Tertiary Butyl Ether	Gasoline/Methyl Tertiary Butyl Ether (MTBE) blends are a mixture of gasoline and as much as 15% MTBE. Gasoline/MTBE blends use in your motorcycle is approved.
Methanol	Methanol or Racing Fuel	Do not use racing fuel or fuel containing methanol; use of these fuels will damage the fuel system.
	5% Ethanol	Fuels with an ethanol content of up to 5% (E5) may be used in your motorcycle without affecting vehicle performance.
	10% Ethanol	Fuels with an ethanol content of up to 10% (E10) may be used in your motorcycle without affecting vehicle performance. United States customers: The United States' Clean Air Act prohibits the use of gasoline blends containing greater than 10% ethanol in motorcycles.
	22% Ethanol	Fuel in the Brazilian market has ethanol content which ranges from 21–27.5%. Harley-Davidson Motorcycles configured for Brazil are equipped with engine control calibrations developed to work properly with these fuels. Use of fuels with high ethanol content in Harley-Davidson motorcycles intended for other regulatory markets may result in poor drivability, setting of the check engine light and potential engine damage.
	85% Ethanol	Do not use fuel containing 85% ethanol. Use of these fuels will damage the fuel system and may lead to engine damage.

## Catalytic Converter

Vehicles in some markets are equipped with catalytic converters.

### NOTICE

**Do not operate catalytic converter-equipped vehicle with engine misfire. If you operate the vehicle under this condition, the exhaust will become abnormally hot, which can cause vehicle damage, including emission control loss. (00149c)**

## REFLEX LINKED ANTI-LOCK BRAKE SYSTEM (ABS)

### Identification

Non-ABS equipped vehicles will display a **NO ABS** message in the odometer window. See OPERATION > ODOMETER WINDOW DISPLAYS (Page 99).

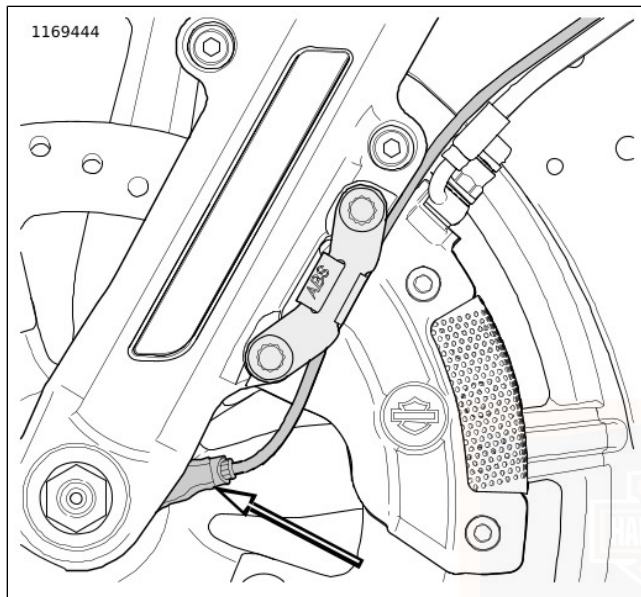
See Figure 11. Reflex-Linked ABS can be identified by a wheel speed sensor on the left side of the front wheel. The wheel speed sensor has a clip with an 'ABS' marking.

See Figure 12. Models with ABS will also have an ABS module (EHCU).

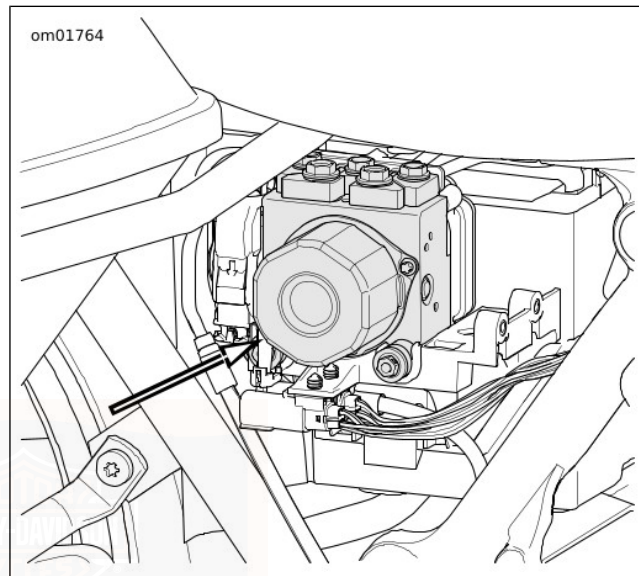
Cornering Rider Safety Enhancements equipped vehicles have a traction control switch. See OPERATION > LEFT HAND CONTROL SWITCHES (Page 92).

See OPERATION > BRAKE SYSTEM (Page 125) for linked brake operation.

See OPERATION > CORNERING RIDER SAFETY ENHANCEMENTS (Page 129) for Cornering Rider Safety Enhancements operation.



**Figure 11. Wheel Speed Sensor (ABS identification typical)**



**Figure 12. ABS Module (EHC) (behind right side cover)**

## CHECKING TIRE PRESSURE AND INSPECTING TIRES

### General Information

#### ⚠ WARNING

Match tires, tubes, rim strips or seals, air valves and caps to the correct wheel. Contact a Harley-Davidson dealer. Mismatching can lead to tire damage, allow tire slippage on the wheel or cause tire failure, which could result in death or serious injury. (00023c)

#### ⚠ WARNING

Harley-Davidson front and rear tires are not the same. Interchanging front and rear tires can cause tire failure, which could result in death or serious injury. (00026a)

### Tire Pressure

#### ⚠ WARNING

Be sure tires are properly inflated, balanced, undamaged, and have adequate tread. Inspect your tires regularly and see a Harley-Davidson dealer for replacements. Riding with excessively worn, unbalanced, improperly inflated, overloaded or damaged tires can lead to tire failure and adversely affect stability and handling, which could result in death or serious injury. (00014b)

Tire pressures should be set using information in Table 23 and Table 24. Tires are considered Cold Tires if the vehicle has not been recently ridden. The tire pressure increases as the tire warms. Tires can warm due to both riding and high ambient air temperatures. Tires can remain warm for up to 2 hours after riding. For the most accurate reading, check tire pressures with a good gauge before riding while the tires are cold.

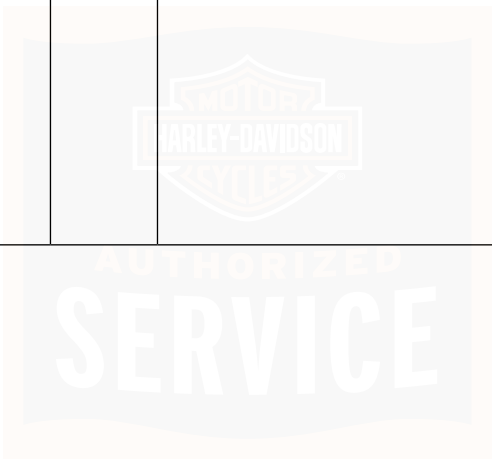
Check tire pressure:

- As part of the pre-ride checklist.
- At every scheduled service interval.

For Cold Tires with an Ambient Air Temp of 20 °C (68 °F) or less: Table 23

**Table 23. Specified Tires**

MODEL	MOUNT	SIZE	SPECIFIED TIRE	PRESSURE (COLD 20 °C (68 °F))	
				psi	kPa
Electra Glide® Standard (FLHT)	front	17 in	Dunlop D408F 130/80B17 65H BW	36	248
Electra Glide® Ultra Limited (FLHTK) Road Glide® Limited (FLTRK) Road King® (FLHR)	front	18 in	Dunlop D408F 130/70B18 63H BW	36	248
Road Glide® (FLTRX) Road Glide® Special (FLTRXS) Road Glide® ST (FLTRXST) Road King® Special (FLHRXS) Street Glide® (FLHX) Street Glide® Special (FLHXS) Street Glide® ST (FLHXST)	front	19 in	Dunlop D408F 130/60B19 61H BW	36	248



**Table 23. Specified Tires**

MODEL	MOUNT	SIZE	SPECIFIED TIRE	PRESSURE (COLD 20 °C (68 °F))	
				psi	kPa
Electra Glide® Standard (FLHT)	rear	16 in	Dunlop D407T 180/65B16 81H BW	40	276
Electra Glide® Ultra Limited (FLHTK)	rear	18 in	Dunlop D407T 180/55B18 80H BW	40	276
Road Glide® (FLTRX)					
Road Glide® Limited (FLTRK)					
Road Glide® Special (FLTRXS)					
Road Glide® ST (FLTRXST)					
Road King® (FLHR)					
Road King® Special (FLHRXS)					
Street Glide® (FLHX)					
Street Glide® Special (FLHXS)					
Street Glide® ST (FLHXST)					

For Cold Tires with an Ambient Air Temp higher than 20 °C (68 °F): Refer to the first column in Table 24 to determine the tire pressure adjustments. For example: If the motorcycle has not been ridden for 2 hours or more and the ambient temperature is 31 °C (88 °F), the recommended front and rear pressures are Table 23 pressures plus 14 kPa (2 psi).

Tires warm due to riding which increases the tire pressure. If the vehicle has been recently ridden, refer to the second column in Table 24 to determine the tire pressure adjustment. For example: If the motorcycle has been recently ridden and the ambient temperature is 31 °C (88 °F), the recommended front and rear pressures are the Table 23 pressures plus 48 kPa (7 psi).

If a tire pressure adjustment is made when the vehicle has been recently ridden, re-adjust the tire pressure per recommendations when the tires have cooled. Tires can remain warm for up to 2 hours after riding.

Harley-Davidson does not perform any testing with only nitrogen in tires. Harley-Davidson neither recommends nor discourages the use of pure nitrogen to inflate tires.

**Table 24. Tire Pressure Adjustment**

<b>AMBIENT AIR TEMPERATURE</b>	<b>MOTORCYCLE NOT RIDDEN FOR 2 HOURS OR MORE: ADD TO FRONT AND REAR PRESSURES IN SPECIFIED TIRES TABLE</b>	<b>MOTORCYCLE RECENTLY RIDDEN: ADD TO FRONT AND REAR PRESSURES IN SPECIFIED TIRES TABLE</b>
20 °C (68 °F) or less	0 kPa (0 psi)	34 kPa (5 psi)
26 °C (79 °F)	7 kPa (1 psi)	41 kPa (6 psi)
31 °C (88 °F)	14 kPa (2 psi)	48 kPa (7 psi)
37 °C (99 °F)	21 kPa (3 psi)	55 kPa (8 psi)
42 °C (108 °F) or higher	28 kPa (4 psi)	62 kPa (9 psi)

## Inspecting Tires

### **⚠ WARNING**

**Replace tire immediately with a Harley-Davidson specified tire when wear bars become visible or only 1 mm (1/32 in) tread depth remains. Riding with a worn tire could result in death or serious injury. (00090c)**

Check tire tread:

- As part of the pre-ride checklist.
- At every scheduled service interval.

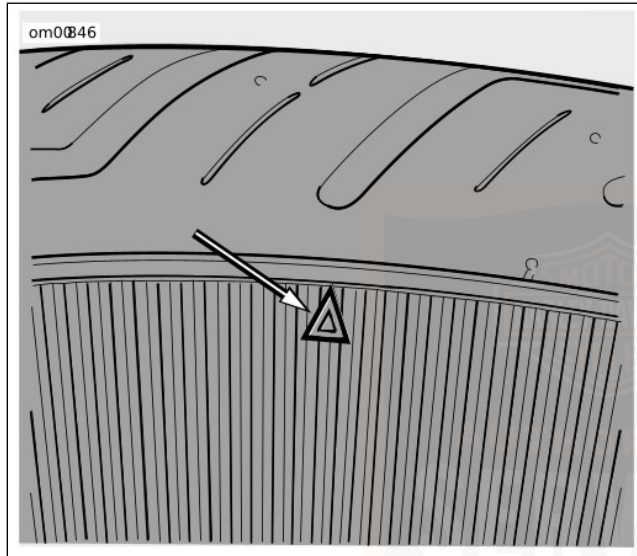
Inspect each tire for punctures, cuts and breaks.

Harley-Davidson tires are equipped with wear bars that run horizontally across the tread.

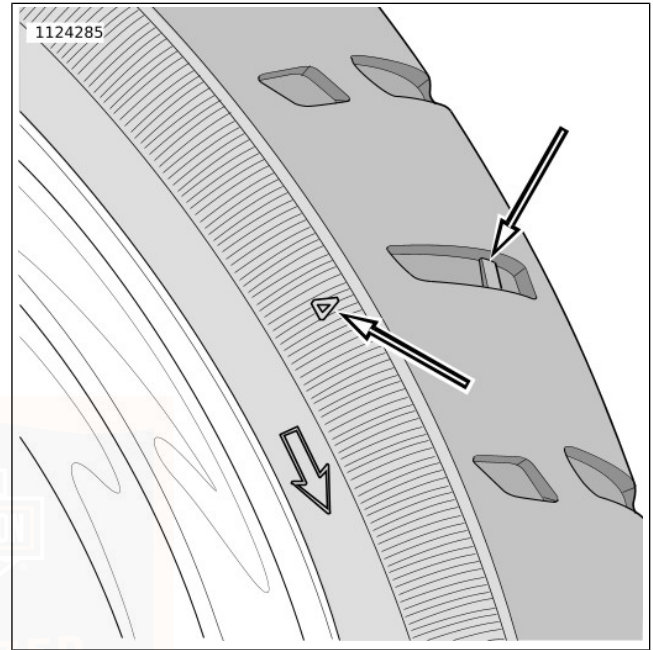
A tire is considered worn when the wear bars are visible or if only 1 mm (0.031 in) tread depth remains. A worn tire can:

- Be more easily damaged leading to tire failure.
- Provide reduced traction.
- Adversely affect stability and handling.

See Figure 13, Figure 14 and Figure 15. Always replace tires before the tread wear bars appear.



**Figure 13. Dunlop Sidewall Tread Wear Indicator Bar Locator**



**Figure 14. Tire Sidewall Wear Bar Locator**

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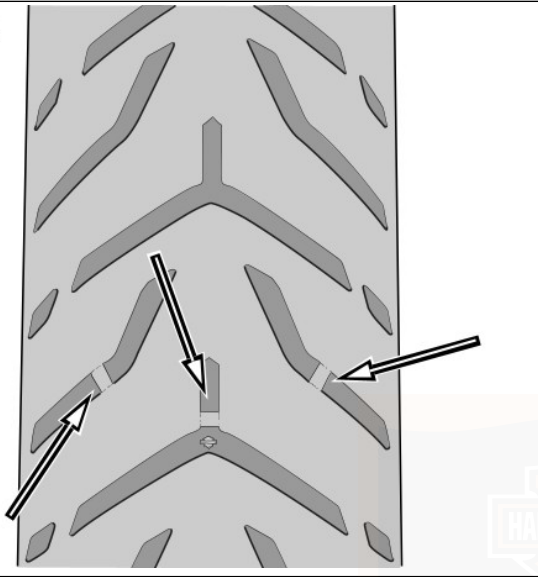


Figure 15. Wear Bar Appearance

## Replacing Tires

### ⚠ WARNING

Tires are a critical safety component. Contact a Harley-Davidson dealer for tire repair or replacement. Improper tire service can adversely affect stability and handling, which could result in death or serious injury. (00057a)

### ⚠ WARNING

Harley-Davidson recommends the use of its specified tires. Harley-Davidson vehicles are not designed for operation with non-specified tires, including snow, moped and other special-use tires. Use of non-specified tires can adversely affect stability, handling or braking and lead to loss of vehicle control, which could result in death or serious injury. (00024d)

### ⚠ WARNING

Only install original equipment tire valves and valve caps. A valve, or valve and cap combination, that is too long or too heavy can strike adjacent components and damage the valve, causing rapid tire deflation. Rapid tire deflation can cause loss of vehicle control, which could result in death or serious injury. (00281a)

### **⚠ WARNING**

Replace punctured or damaged tires. In some cases, small punctures in the tread area may be repaired from within the removed tire by a Harley-Davidson dealer. Speed should NOT exceed 80 km/h (50 mph) for the first 24 hours after repair, and the repaired tire should NEVER be used over 129 km/h (80 mph). Failure to follow this warning could lead to tire failure and result in death or serious injury. (00015b)

### **⚠ WARNING**

Replace tire immediately with a Harley-Davidson specified tire when wear bars become visible or only 1 mm (1/32 in) tread depth remains. Riding with a worn tire could result in death or serious injury. (00090c)

**New** tires are needed if any of the following conditions exist (refer to Table 23 for the specified replacement tires):

- Tread wear bars become visible on the tread surfaces.
- Tire cords or fabric become visible through cracked sidewalls, snags or deep cuts.
- Bumps, bulges or slits in the tire.
- Punctures, cuts, or other damage to the tire that cannot be repaired.

When installing tires on rims, do not rely on tread design to determine direction of rotation. Always be sure the rotational arrows molded into the sidewalls point in the direction of rotation when the vehicle is moving forward.

## **ADJUSTING MIRRORS**

### **⚠ WARNING**

Objects in mirrors are closer than they appear. Use caution when judging distance of objects in mirrors. Failure to judge correct distances could result in death or serious injury. (00033a)

Your motorcycle has two convex rear view mirrors.

This type of mirror is designed to give a much wider view to the rear than a flat mirror. However, cars and other objects seen in this type of mirror look smaller and farther away than they actually are.

- Use caution when judging the size or relative distance of objects seen in rear view mirrors.
- Always adjust the rear view mirrors to reflect the area behind the motorcycle before riding.

### **NOTE**

*Adjust mirrors so you can see a small portion of your shoulders in each mirror. This will help you establish the relative distance of vehicles to the rear of your motorcycle.*

## OPERATING JIFFY STAND

### Location

#### ⚠ WARNING

Always park motorcycle on a level, firm surface. An unbalanced motorcycle can fall over, which could result in death or serious injury. (00039a)

#### ⚠ WARNING

The jiffy stand locks when placed in the full forward (down) position with vehicle weight on it. If the jiffy stand is not in the full forward (down) position with vehicle weight on it, the vehicle can fall over which could result in death or serious injury. (00006a)

#### ⚠ WARNING

Be sure jiffy stand is fully retracted before riding. If jiffy stand is not fully retracted, it can contact the road surface causing a loss of vehicle control, which could result in death or serious injury. (00007a)

#### NOTE

*When parking your motorcycle on a grade, place the transmission in gear after turning off the engine.*

Refer to: YOUR MOTORCYCLE > PRIMARY CONTROLS AND SERVICE COMPONENTS (Page 24). The jiffy stand is located on the left side of the motorcycle.

### Jiffy Stand Switch: International Models

Some international models have a jiffy stand interlock switch.

The motorcycle will start and run with the jiffy stand down while the transmission is in neutral. If the jiffy stand is down and the transmission in gear, engaging the clutch stalls the motorcycle. Raising the jiffy stand or putting the transmission in neutral will permit the engine to run.

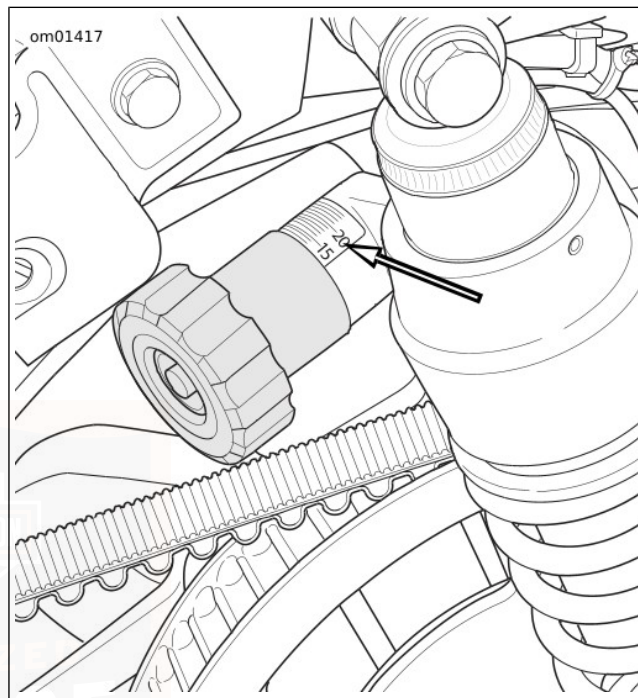
While the motorcycle is in motion at speeds greater than 15 km/h (9 mph), lowering the jiffy stand will not stop the engine.

### ADJUSTING SHOCK ABSORBERS

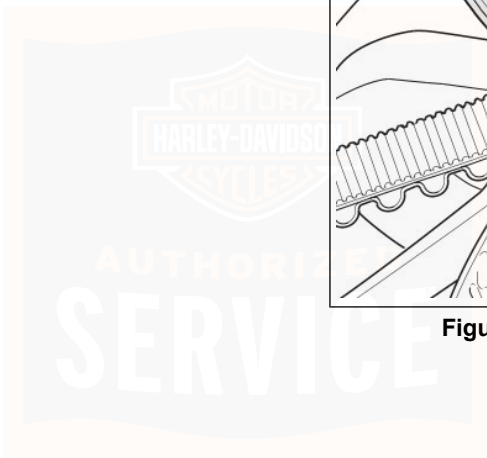
Adjust the shock absorber preload for the total weight the motorcycle is to carry.

- Increase the preload to accommodate more weight.
  - Reduce the preload if carrying less weight.
1. Remove the left saddlebag.
  2. See Figure 16. Rotate the knob to the desired setting for the expected load. The knob will click after each half turn. Refer to Table 25, Table 26 or Table 27.

3. Turn the knob half turns to fine tune the ride if desired.
4. Install the left saddlebag.



**Figure 16. Preload Adjustment Knob**



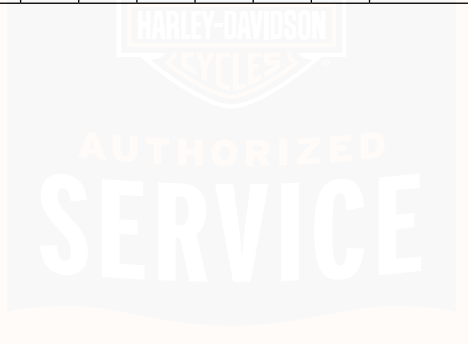
**Table 25. Suspension Preload Table: Standard Length Shocks, with Tour-Pak**

		ADDITIONAL WEIGHT OF PASSENGER, CARGO AND ACCESSORIES																			
		LB	0	10	20	30	40	50	60	70	80	90	100	110	120	130	140	150	160	170	180
		KG	0	5	9	14	18	23	27	32	36	41	45	50	54	59	64	68	73	77	82
<b>RIDER WEIGHT</b>																					
LB	KG	Full Turns of Knob																			
150	68	0	0	0	1	2	3	4	5	6	6	7	8	9	10	11	12	13	14	15	15
160	73	0	0	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	15	15
170	77	0	0	1	2	3	4	5	6	7	8	9	10	10	11	12	13	14	15	16	16
180	82	0	1	2	3	4	4	5	6	7	8	9	10	11	12	13	14	15	16	17	17
190	86	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	14	15	16	17	17
200	91	1	2	3	4	5	6	7	8	9	9	10	11	12	13	14	15	16	17	18	18
210	95	2	3	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	18	18
220	100	2	3	4	5	6	7	8	9	10	11	12	13	13	14	15	16	17	18	19	19
230	104	3	4	5	6	7	7	8	9	10	11	12	13	14	15	16	17	18	19	20	20
240	109	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	17	18	19	20	20
250	113	4	5	6	7	8	9	10	11	12	12	13	14	15	16	17	18	19	20	21	21
260	118	5	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	20	21	21
270	123	5	6	7	8	9	10	11	12	13	14	15	16	16	17	18	19	20	21	22	22



**Table 26. Suspension Preload Table: Standard Length Shocks, without Tour-Pak**

		ADDITIONAL WEIGHT OF PASSENGER, CARGO AND ACCESSORIES																			
		LB	0	10	20	30	40	50	60	70	80	90	100	110	120	130	140	150	160	170	180
		KG	0	5	9	14	18	23	27	32	36	41	45	50	54	59	64	68	73	77	82
<b>RIDER WEIGHT</b>																					
LB	KG	Full Turns of Knob																			
150	68	0	0	0	2	3	5	7	8	10	12	13	15	17	18	20	22	23	-		
160	73	0	0	1	3	4	6	8	9	11	13	14	16	18	19	21	23	-			
170	77	0	0	2	4	6	7	9	10	12	14	15	17	19	20	22	23	-			
180	82	0	1	3	5	7	8	10	11	13	15	16	18	20	21	23	-				
190	86	1	3	4	6	8	9	11	13	14	16	17	19	21	22	23	-				
200	91	2	4	5	7	9	10	12	14	15	17	18	20	22	23	-					
210	95	3	5	6	8	10	11	13	15	16	18	19	21	23	-						
220	100	4	6	7	9	11	12	14	16	17	19	21	22	23	-						
230	104	5	7	8	10	12	14	15	17	18	20	22	23	-							
240	109	6	8	9	11	13	15	16	18	19	21	23	-								
250	113	7	9	10	12	14	16	17	19	20	22	23	-								
260	118	8	10	11	13	15	17	18	20	22	23	-									
270	122	9	11	13	14	16	18	19	21	23	-										



**Table 27. Suspension Preload Table: Low Length Shocks, with or without Tour-Pak**

		ADDITIONAL WEIGHT OF PASSENGER, CARGO AND ACCESSORIES																			
		LB	0	10	20	30	40	50	60	70	80	90	100	110	120	130	140	150	160	170	180
		KG	0	5	9	14	18	23	27	32	36	41	45	50	54	59	64	68	73	77	82
<b>RIDER WEIGHT</b>																					
LB	KG	Full Turns of Knob																			
150	68	0	0	0	1	2	3	4	6	7	8	9	10	11	13	14	15	16	17	18	
160	73	0	0	0	2	3	4	5	6	7	9	10	11	12	13	14	16	17	18	19	
170	77	0	0	1	2	3	4	5	6	7	8	9	10	12	13	14	15	16	18	19	20
180	82	0	1	2	3	4	5	7	8	9	10	11	12	14	15	16	17	18	19	21	
190	86	0	1	3	4	5	6	7	9	10	11	12	13	14	16	17	18	19	20	21	
200	91	1	2	3	5	6	7	8	9	10	12	13	14	15	16	17	19	20	21	22	
210	95	2	3	4	5	7	8	9	10	11	12	14	15	16	17	18	19	21	22	23	
220	100	3	4	5	6	7	8	10	11	12	13	14	16	17	18	19	20	21	23	-	
230	104	3	4	6	7	8	9	10	12	13	14	15	16	17	19	20	21	22	23	-	
240	109	4	5	6	8	9	10	11	12	13	15	16	17	18	19	21	22	23	-	-	
250	113	5	6	7	8	10	11	12	13	14	15	17	18	19	20	21	22	23	-	-	
260	118	6	7	8	9	10	11	13	14	15	16	17	19	20	21	22	23	-	-	-	
270	122	6	8	9	10	11	12	13	15	16	17	18	19	20	22	23	-	-	-	-	



## SECURITY SYSTEM

### Components

The security system consists of a control module, a hands-free antenna mounted on the motorcycle and a hands-free fob carried by the rider. The security system lamp in the speedometer face indicates when security is armed or disarmed.

See SECURITY SYSTEM > ARMING AND DISARMING (Page 66).

### Options

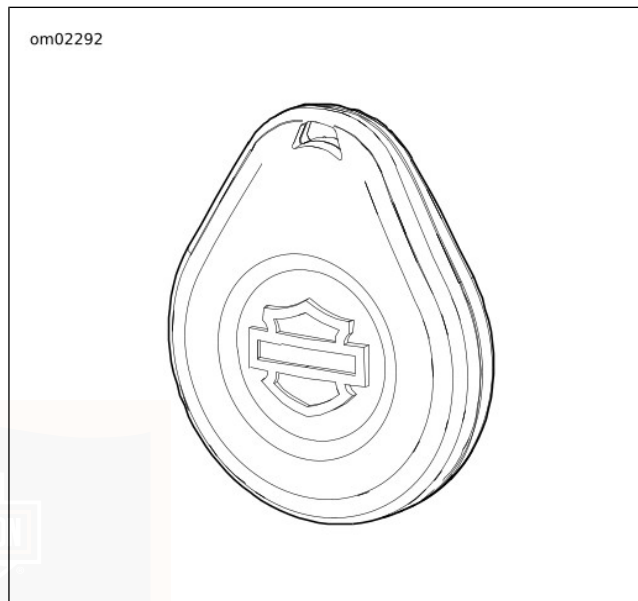
See a Harley-Davidson dealer or [www.harley-davidson.com](http://www.harley-davidson.com) for security system options.

## SECURITY SYSTEM FOB

### Assigning Fob

See Figure 17. Key fobs are electronically assigned to the security system by a Harley-Davidson dealer. Only two fobs can be assigned at any one time.

Purchase replacement fobs from a Harley-Davidson dealer. The fobs can only be assigned to an individual motorcycle by a trained Harley-Davidson technician.



**Figure 17. Fob: Security System**

#### NOTE

- *The module will arm only if the fob has been assigned by a Harley-Davidson dealer and a Personal Identification Number (PIN) has been entered in the system. Record the PIN on the Personal Information page in the front of this Owner's Manual and on the removable wallet card.*

- If the fob is misplaced or fails, the rider can refer to the wallet card and use the PIN to manually disarm the system. See SECURITY SYSTEM > ARMING AND DISARMING (Page 66) and SECURITY SYSTEM > TROUBLESHOOTING (Page 72).
- The rider can change the PIN at any time. See SECURITY SYSTEM > PERSONAL IDENTIFICATION NUMBER (PIN) (Page 63).

## Fob Battery

### ⚠ WARNING



**CONTAINS BUTTON OR COIN CELL BATTERY. KEEP OUT OF REACH OF CHILDREN.**

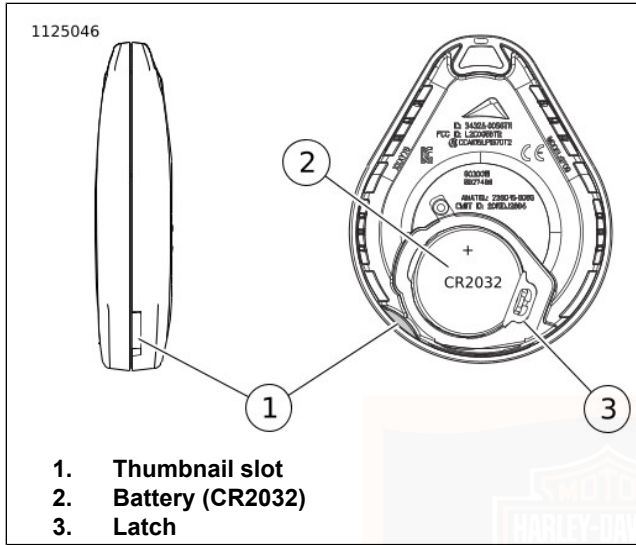
**Ingestion can result in death or serious injury. Choking, chemical burns and perforation of soft tissue may result. Severe burns can occur within 2 hours of ingestion or placement in any part of the body. Seek medical attention immediately. (13105b)**

Replace the fob battery every year.

62 SECURITY SYSTEM

### NOTE

- The reusable label found on the fob packaging lists the serial number of the fob. For reference, affix the label to a blank "NOTES" page in this Owner's Manual.
  - See Figure 18. The serial number of the fob is also found on the inside of the fob.
1. See Figure 18. To open the fob, turn a thin blade in the slot (1).
  2. Remove the battery (2) and discard in accordance with local regulations.
  3. Install a **new** battery (Panasonic CR2032 or equivalent) with the positive side up.
  4. Align the two halves of the fob. Snap the halves together.



**Figure 18. Replace Fob Battery**

### **Riding with a Fob**

- Always carry the fob when riding, loading, fueling, moving, parking or servicing the motorcycle.
- Do not leave the fob attached to the handlebars or store the fob in a luggage compartment. Unintentionally leaving the fob with the motorcycle when it is parked prevents the system from activating the alarm.

- Do not ride with the fob stored in a metal case or with the fob closer than 76 mm (3.0 in) to a mobile phone, PDA, display or other electronic device. Any electromagnetic interference may prevent the fob from disarming the system.
- For added security, always lock the fork and remove the key when parked. If the fob is within range and the motorcycle is unlocked, tampering with the motorcycle will not activate the alarm.

### **Riding without a Fob**

If the motorcycle is ridden without the fob in acceptable proximity, the odometer window temporarily displays "NO FOB." To restart a motorcycle without a fob, disarm the security system with the PIN.

### **PERSONAL IDENTIFICATION NUMBER (PIN)**

The personal identification number (PIN) is a number that can be used to disarm the security system. Use the PIN in case the assigned fob is misplaced, fails or if the fob cannot communicate with the motorcycle because of electromagnetic interference.

A PIN is a five-digit number (1-9, no zeros).

## Changing the PIN

The rider can change the PIN at any time. Refer to Table 28.

Table 28. Changing the PIN

STEP NO.	ACTION	WAIT FOR CONFIRMATION	NOTES
1	Select a 5-digit (1 thru 9) PIN and record on the wallet card from owner's manual.		
2	With an assigned fob present, turn the engine stop switch to <b>OFF</b> .		
3	Turn the ignition switch to <b>IGN</b> .		
4	Cycle the OFF/RUN switch twice: <b>RUN - OFF - RUN - OFF - RUN</b> .		
5	Press <b>left</b> turn signal switch <b>two times</b> .	ENTER PIN will scroll through the odometer window.	
6	Press <b>right</b> turn signal switch <b>one time</b> and release.	Turn signals will flash three times. Current PIN will appear in odometer. The first digit will be flashing.	
7	Enter first digit of new PIN by pressing and releasing the <b>left</b> turn signal switch until the selected digit appears.		
8	Press <b>right</b> turn signal switch <b>one time</b> and release.	The new digit will replace the current in odometer window.	
9	Enter second digit of selected PIN by pressing and releasing the <b>left</b> turn signal switch until the selected digit is present.		

**Table 28. Changing the PIN**

<b>STEP NO.</b>	<b>ACTION</b>	<b>WAIT FOR CONFIRMATION</b>	<b>NOTES</b>
10	Press <b>right</b> turn signal switch <b>one time</b> and release.	The new digit will replace the current in odometer window.	
11	Enter third digit of the selected PIN by pressing and releasing the <b>left</b> turn signal switch until the selected digit is present.		
12	Press <b>right</b> turn switch <b>one time</b> and release.	The new digit will replace the current in odometer window.	
13	Enter fourth digit of new PIN by pressing and releasing the <b>left</b> turn signal switch until the selected digit is present.		
14	Press <b>right</b> turn switch <b>one time</b> and release.	The new digit will replace the current in odometer window.	
15	Enter fifth digit of the new PIN by pressing and releasing the <b>left</b> turn signal switch until the selected digit is present.		
16	Press <b>right</b> turn switch <b>one time</b> and release.	The new digit will replace the current in odometer window.	
17	Turn the engine stop switch <b>OFF</b> , then turn the ignition switch to <b>OFF</b> .		Pushing the engine stop switch to <b>OFF</b> stores the new PIN in the module.

## SECURITY STATUS INDICATOR

See OPERATION > INDICATORS (Page 86). The security lamp in the speedometer face indicates the status of the security system.

- **Armed:** A lamp that blinks approximately every 3 seconds indicates that the system is armed.
- **Disarmed:** After the system disarms and the ignition is on, the lamp will remain illuminated for approximately four seconds and then turn off.
- **Service:** If the lamp remains lit continuously, see a Harley-Davidson dealer.

## ARMING AND DISARMING

### Arming

When the motorcycle is parked and the ignition is turned to OFF or ACCESSORY, the security system arms automatically within five seconds if no motion is detected. Even when the fob is present, the system arms.

On arming, the turn signals flash twice and the optional siren chirps twice if the siren is in the chirp mode. While armed, the indicator lamp in the speedometer face flashes every three seconds.

### NOTE

**Models with optional siren:** The system must be in the chirp mode for the siren to chirp on arming or disarming. See SECURITY SYSTEM > SIREN CHIRP MODE (CONFIRMATION) (Page 70).

### Disarming

With the fob present, the rider may ride or move the motorcycle for parking, storage or service without setting off the alarm. Disarming is automatic as long as the fob is within range.

**Fob:** An armed security system is automatically disarmed when the fob is present and the motorcycle is moved or the ignition switch is turned to IGNITION or ACCESSORY. The range of the fob is 2 m (5 ft).

When the system disarms, the optional siren chirps once and the security indicator lamp illuminates for a solid four seconds and then turns off.

**Personal identification number (PIN):** If the fob is misplaced or if the present fob fails to communicate, the system can be disarmed with the personal identification number (PIN). Refer to Table 29.

## Disarming with a PIN

Disarm the security system manually using the PIN if the fob is lost, the fob battery is discharged or if where you parked there is a strong electromagnetic interference.

Do not turn handlebars, straddle seat or lift motorcycle off the jiffy stand. During a PIN disarm, if the security system detects motorcycle motion the system will activate the alarm.

### NOTE

- If a mistake is made while entering PIN, turn the ignition switch to OFF before entering the last digit and then start the procedure from the beginning.
- If the procedure fails to disarm the security system, wait two minutes before attempting another PIN disarm.
- The security system remains disarmed until the ignition is turned to OFF.
- At any time during a PIN disarm if the fob is brought within range, the security system disarms as the module receives the coded signal from the fob.

**Table 29. Entering a PIN to Disarm Security System**

STEP NO.	ACTION	WAIT FOR CONFIRMATION	NOTES
1	If necessary, verify the current 5-digit PIN.		Should be recorded.
2	Turn ignition to <b>IGN</b> .	If armed, the odometer window display will read: ENTER PIN and the security lamp will be flashing at a fast rate. The headlight will not be on.	
3	Press and release the left turn signal switch.	In the odometer window, a flashing 1 will appear.	
4	Advance the digit by tapping the left turn signal until the odometer window displays the first digit of the PIN.	The first digit in the odometer will be the first digit in the PIN.	

**Table 29. Entering a PIN to Disarm Security System**

<b>STEP NO.</b>	<b>ACTION</b>	<b>WAIT FOR CONFIRMATION</b>	<b>NOTES</b>
5	Press <b>right</b> turn switch <b>1 time</b> .	The first digit is stored and the next digit will flash.	Serves as enter key.
6	Advance the second digit using the left turn switch until the digit reaches the second digit of the PIN.	The second digit in the odometer will be the second digit in the PIN.	
7	Press <b>right</b> turn switch <b>1 time</b> .	The second digit is stored and the next dash will flash.	Serves as enter key.
8	Advance the third digit using the left turn switch until it reaches the third digit of the PIN.	The third digit in the odometer will be the third digit in the PIN.	
9	Press <b>right</b> turn switch <b>1 time</b> .	The third digit is stored and the next dash will flash.	Serves as enter key.
10	Advance the fourth digit using the left turn switch until it reaches the fourth digit of the PIN.	The fourth digit in the odometer will be the fourth digit in the PIN.	
11	Press <b>right</b> turn switch <b>1 time</b> .	The fourth digit is stored and the next dash will flash.	Serves as enter key.
12	Advance the fifth digit using the left turn switch until it reaches the fifth digit of the PIN.	The fifth digit in the odometer will be the fifth digit in the PIN.	
13	Press <b>right</b> turn switch <b>1 time</b> .	The fifth digit is stored. The security system indicator lamp stops blinking.	Security System is disarmed.

## ALARM

### Ignition Disabled

When the fob is not present and the system is armed, if the ignition switch is turned to IGNITION or ACCESSORY, the security lamp will flash at a fast rate and the odometer window display will scroll "ENtER PIN". The headlamp will not turn on.

After approximately 10 seconds, if the system does not receive a left turn signal switch input, the display will go blank. The ignition system will remain disabled until the fob is present or the current PIN is entered.

### Warnings

Once armed, if the motorcycle is moved or lifted up off of its jiffy stand and the fob is not present, the alarm will warn the operator with three alternate flashes of the turn signals and a chirp of the optional siren.

Within four seconds, if the motorcycle is back on its jiffy stand and no further motion is detected and/or the ignition is turned to OFF, the system will remain armed without activating the alarm.

If the motorcycle motion continues, the system will issue a second warning four seconds after the first.

### NOTE

*During warnings and alarms, the starter motor and the ignition circuits are disabled.*

### Alarm Activation

If the security system is still detecting motion and/or if the ignition has not been turned back to OFF after a second warning, the system will activate the alarm.

When activated, the security system will:

- Alternately flash the four turn signals.
- Sound the optional siren.

**Duration:** The alarm will stop within 30 seconds and if no motion is detected, the alarm will not restart.

However, if motorcycle motion continues, the system will repeat the 30 second alarm and recheck for motion. The alarm will repeat this 30 second alarm cycle for five minutes (10 cycles) or until the alarm is deactivated.

### NOTE

*The alarm will also activate the LED, vibration or audible modes of a Harley-Davidson security pager. A pager can operate either in silent or in combination with an optional siren. The range of a pager can be up to 0.8 km (0.5 mi). See a Harley-Davidson dealer for details.*

## Deactivate Alarm

- **Key fob:** Bring the fob to within 1.5 m (5 ft) of the motorcycle. After the module identifies that the fob is present, the system will terminate the alarm.
- **PIN entry:** Enter the PIN to deactivate the alarm. If an error is made while entering the PIN, wait until the alarm is between cycles to enter the PIN.

## SIREN CHIRP MODE (CONFIRMATION)

Vehicles with optional siren can be set to chirp upon arming and disarming.

### Chirp Mode

In chirp mode, the siren sounds two chirps when arming, and a single chirp when disarming.

### Chirpless Mode

In chirpless mode, the siren does not chirp on arming or disarming.

The siren still provides warning chirps and sounds the alarm if the motorcycle is moved without the fob present.

## Switching Modes

Perform the following to switch between chirp and chirpless modes.

1. With security fob present, set the ignition switch to IGNITION.
2. Count two seconds, set the ignition switch to OFF.
3. When the security lamp turns off (but before the turn signals flash twice), immediately set the ignition switch to IGNITION.
4. Count two seconds, immediately set the ignition switch to OFF.
5. When the security lamp turns off (but before the turn signals flash twice), immediately set the ignition switch to IGNITION. The system changes mode. The siren chirps or remains silent accordingly.

## TRANSPORT MODE

When transporting the motorcycle, place the system in the transport mode. Otherwise, the alarm activated by motion detection can discharge the battery.

In the transport mode, the security system is armed without enabling the motion detector for one ignition cycle. This allows the vehicle to be picked up and moved in an armed state.

However, any attempt to start the engine when the fob is not within range will trigger the alarm.

## To Enter Transport Mode

1. With an assigned fob within range, turn the ignition switch to IGNITION.
2. Before the security lamp goes out, turn the ignition switch to OFF.
3. Within three seconds, simultaneously press both the left and the right turn signal switches.
4. After the turn signals flash once, the system enters the transport mode. With the fob removed, the motorcycle can be moved without setting off the alarm.

### NOTE

**Models with fairing:** When transport mode is enabled the odometer window will display *TSPORT MODE ACTIVE* message.

## To Exit Transport Mode

With the fob present, turn the ignition switch to IGNITION to disarm the system.

## STORAGE AND SERVICE DEPARTMENTS

### Long-Term Parking

To maintain arming, store the fob beyond the range of the antenna. The antenna range is approximately 1.5 m (5 ft). Have the fob present before moving parked motorcycle.

If the motorcycle will not be operated for several months, such as during the winter season, see AFTER RIDING > STORING MOTORCYCLE (Page 161).

### Service Departments

When the motorcycle is left at a Harley-Davidson dealer, there are two options:

1. Leave an assigned fob with the dealer.
2. To maintain possession of the fob, ask the dealer to disable the system for service (service mode) before leaving the dealership. Once service mode is active, the vehicle can be operated without an assigned fob present. To maintain the service mode, the assigned fobs must be kept out of range. If the fob appears in range, the service mode is cancelled.

## DISCONNECTING POWER

### All Models

When disconnecting the battery or removing the main fuse, perform the following steps.

1. Verify that the fob is present.
2. Turn the ignition switch to IGNITION.
3. Pull the main fuse from its holder.
4. Disconnect the battery if needed.

#### NOTE

*Place the ignition switch in the OFF position before installing the main fuse.*

## TROUBLESHOOTING

### Security Lamp

If the security lamp stays illuminated while riding, see a Harley-Davidson dealer.

### Fob

If the security system continues to actuate warnings and alarms with the fob present, check for:

1. **Electromagnetic interference:** Other electronic devices, power lines, or other electromagnetic sources can cause the security system to operate inconsistently.
  - a. Verify that the fob is not in a metal enclosure or within 76 mm (3 in) of any other electronic devices.
  - b. Place the fob on the seat and set the ignition switch to IGNITION. After the system disarms, return the fob to a convenient location.
  - c. Move motorcycle at least 5 m (15 ft) from the spot of interference.
2. **Discharged fob battery:** Use the PIN to disarm the system. Replace the battery. See SECURITY SYSTEM > SECURITY SYSTEM FOB (Page 61).

#### NOTE

**Models with fairing:** When fob battery is low the odometer window will display FOB LOW BATT message.

3. **Damaged fob:** Use the PIN to disarm the motorcycle. Replacement fobs are available for purchase from a Harley-Davidson dealer.

## Siren (If equipped)

- If the siren does not chirp two or three times on a valid arming command from the security module, the siren is either in the Chirpless Mode, not connected, not working, or the siren wiring was opened or shorted while the siren was disarmed.
- If the siren is armed and the internal siren battery is dead, shorted, disconnected, or has been charging for a period longer than 24 hours, the siren will respond with three chirps on arming instead of two.
- The internal siren battery may not charge if the vehicle's battery is less than 12.5 volts.
- If the siren enters the self-driven mode where it is powered from the siren's internal 9 volt battery, the turn signal lamps may or may not alternately flash. If the security module activates the siren, the turn signal lamps will alternately flash. If the siren has been armed and a security event occurs, and the siren is in self-driven mode, the siren will alarm 20-30 seconds and then turn off for 5-10 seconds. This alarm cycle will be repeated ten times if the siren is in the self-driven mode.



# NOTES

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## IGNITION SWITCH

### ⚠ WARNING

The automatic-on headlamp feature provides increased visibility of the rider to other motorists. Be sure headlamp is on at all times. Poor visibility of rider to other motorists can result in death or serious injury. (00030b)

See YOUR OWNER'S MANUAL section. Be sure to record all your key numbers in the space provided at the front of this book.

See Figure 19. The ignition switch controls electrical functions of the motorcycle.

### ⚠ WARNING

Do not operate vehicle with forks locked. Locking the forks restricts the vehicle's turning ability, which could result in death or serious injury. (00035a)

### NOTICE

Protect your vehicle against theft. Failure to lock the motorcycle after parking could result in theft and/or equipment damage. (00151b)

### NOTICE

Do not lubricate barrel locks with petroleum based lubricants or graphite. Inoperative locks may result. (00152a)

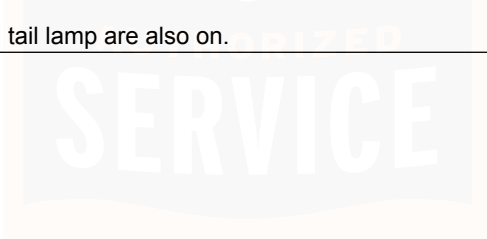
### NOTE

- *Harley-Davidson recommends removing key from ignition/fork lock before operating motorcycle. If you do not remove key, it can fall out during operation.*
- *ACCESSORY - Accessories and hazard warning flasher can be turned on. Instrument lamps are on. Brake lamp and horn can be activated. Key may be removed.*
- *The lamps illuminate when the switch is in the IGNITION position, as required by law in some localities.*

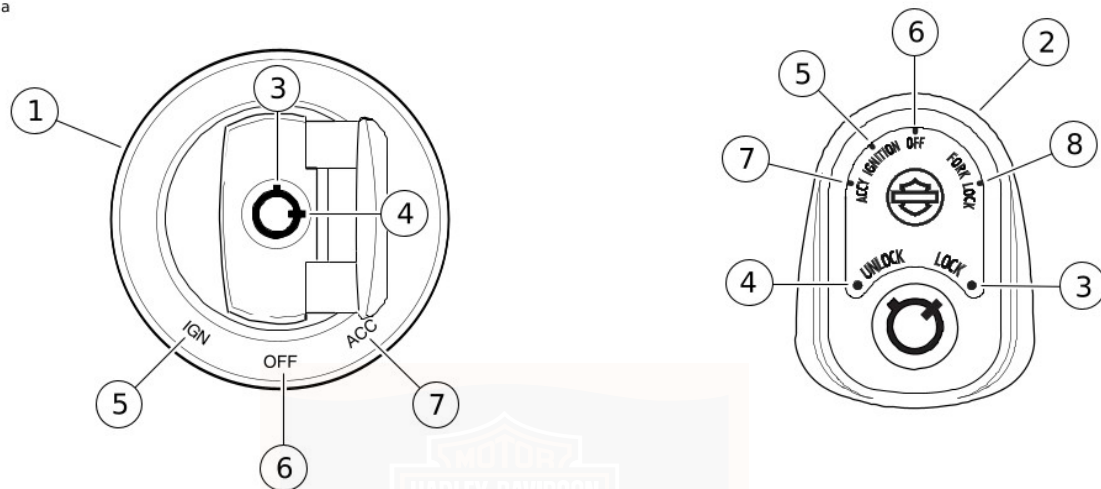
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SERVICE

**Table 30. Ignition Switch Positions**

MODEL	FUNCTION	LABEL	OPERATION
Without Fairing	Switch*	OFF	Ignition, lamps and accessories are off.
		ACCESSORY	Accessories are on. Hazard warning flashers can be left on. Instrument lamps are on. Brake lamp and horn can be activated.*
		IGNITION	Ignition, lamps and accessories are on.**
With Fairing	Key Lock	LOCK	Locks the switch in either the FORK LOCK or ACCESSORY position. Remove the key for security.
		UNLOCK	Unlocks the switch. Unlocked, the switch can be rotated to any of the 4 positions. To prevent loss when riding, remove the key.
	Switch	FORK LOCK	Locks fork in left position to discourage unauthorized use of vehicle when parked. See OPERATION > FORK LOCK (Page 78) for operation.
		OFF	When switch is in OFF position, the ignition, lamps and accessories are off.
		IGNITION	When the switch is in the IGNITION position, the motorcycle can be started and all lamps and accessories will operate.
		ACCESSORY	In ACCESSORY, the instrument lamps and accessories operate but the engine can not be started. Brake lamp and horn can be activated. The 4-way hazard flashers operate. The switch can be locked in ACCESSORY.
	* Switch lock is under the switch cover. Insert key and turn key counterclockwise to lock, clockwise to unlock. Key may be removed in any position.		
** International models: Position lamp and tail lamp are also on.			



om01673a



- |                                     |              |
|-------------------------------------|--------------|
| 1. Ignition switch: Without fairing | 5. Ignition  |
| 2. Ignition switch: With fairing    | 6. Off       |
| 3. Lock                             | 7. Accessory |
| 4. Unlock                           | 8. Fork lock |

Figure 19. Ignition Switch

## FORK LOCK

### NOTICE

**Protect your vehicle against theft. Failure to lock the motorcycle after parking could result in theft and/or equipment damage. (00151b)**

Using the fork lock immediately after parking your motorcycle will discourage unauthorized use or theft.

**Without fairing:** See Figure 20. The fork lock is at the top of the steering head, behind the headlamp nacelle and inset in the handlebar clamp shroud.

**With fairing:** See Figure 19. The fork lock is integrated into the ignition switch.

### NOTE

*Do not force the switch into the locked position or switch damage can occur.*

### ⚠ WARNING

**Do not operate vehicle with forks locked. Locking the forks restricts the vehicle's turning ability, which could result in death or serious injury. (00035a)**

## To Lock Fork: Without fairing

1. Turn fork to full left position.
2. See Figure 20. Insert key and turn key counterclockwise to LOCK position. Remove key.
3. To unlock fork, insert key and turn clockwise to UNLOCK position. Remove key.
4. Check steering for proper operation by turning the handlebars through the full operating range. Handlebars should turn smoothly without binding.

## To Lock Fork: With fairing

1. Turn fork to full left position.
2. See Figure 19. Turn switch knob to FORK LOCK. Push knob down.
3. Insert key and turn key to LOCK position. Remove key.
4. To unlock fork, insert key and turn to UNLOCK position. Remove key. Rotate switch knob out from the FORK LOCK position.
5. Check steering for proper operation by turning the handlebars through the full operating range. Handlebars should turn smoothly without binding.

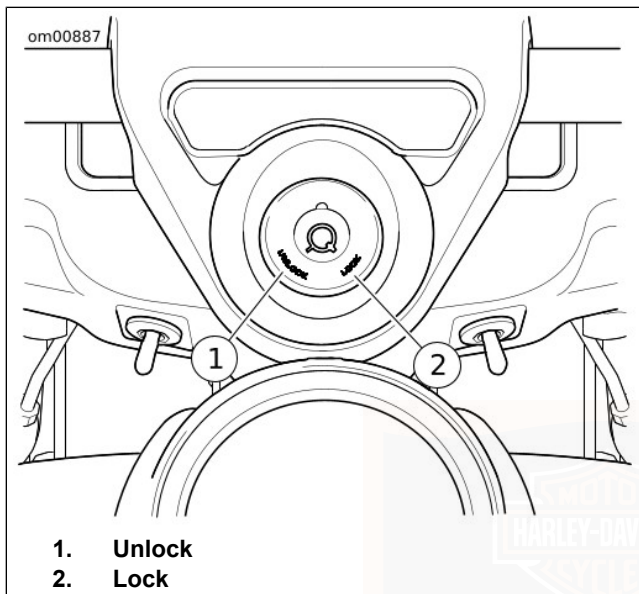


Figure 20. Fork Lock: Models Without Fairing

## GENERAL: CONTROLS AND INDICATORS

### ⚠ WARNING

Identify and understand the specific features of your vehicle. Failure to understand how these features affect the vehicle's operation can lead to an accident, which could result in death or serious injury. (00043b)

Some features explained are unique to certain models. These features may be available as accessories for your Harley-Davidson motorcycle. See a Harley-Davidson dealer for a complete list of accessories that will fit your specific motorcycle.

## CONTROLS, INSTRUMENTS AND SWITCHES

### Clutch Hand Lever

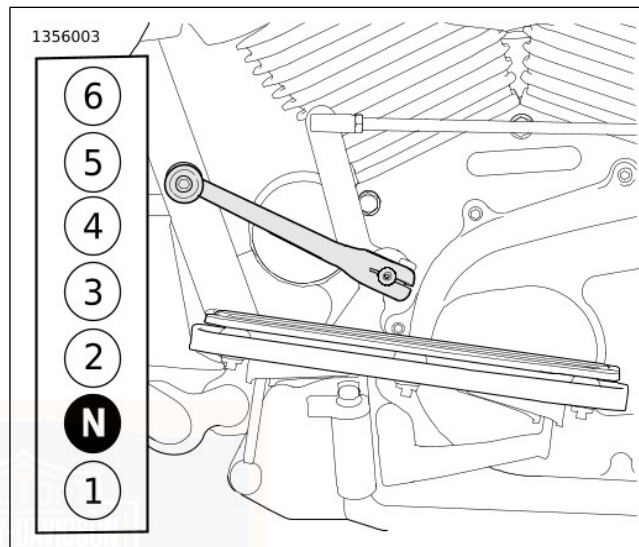
### ⚠ WARNING

Do not position fingers between hand control lever and handlebar grip. Improper hand positioning can impair control lever operation and cause loss of vehicle control, which could result in death or serious injury. (00032a)

See Figure 4. The clutch hand lever (1) is operated with the fingers of the left hand. See OPERATION > SHIFTING GEARS (Page 132).

## **Gear Shift Lever**

See Figure 21. The gear shift lever is operated with the left foot. Neutral is found between first and second gear in the six speed shift pattern. See OPERATION > SHIFTING GEARS (Page 132).



**Figure 21. Gear Shift Lever and Shift Pattern**

## **Left-Hand Control Module**

See Figure 4. Operate the switches on the left hand control module (11) with the thumb of the left hand. See OPERATION > LEFT HAND CONTROL SWITCHES (Page 92).

## Speedometer/Odometer

See Figure 4. The current road speed is displayed in the speedometer (3). The accumulated mileage and individual trip mileage is displayed in the odometer window in the face of the speedometer. See OPERATION > INSTRUMENTS (Page 82).

## Right-Hand Control Module

See Figure 4. Operate the switches on the right hand control module (8) with the thumb of the right hand. See OPERATION > RIGHT HAND CONTROL SWITCHES (Page 95).

## Brakes

### ▲ WARNING

**Do not position fingers between hand control lever and handlebar grip. Improper hand positioning can impair control lever operation and cause loss of vehicle control, which could result in death or serious injury. (00032a)**

**Front brake lever:** See Figure 4. The front brake lever (6) controls the front brake. Operate the hand lever with the fingers of the right hand.

**Rear brake pedal:** See Figure 5. The rear brake pedal (7) activates the rear wheel brake.

### ▲ WARNING

**Do not apply brake strongly enough to lock the wheel. A locked wheel will skid and can cause loss of vehicle control, which could result in death or serious injury. (00053a)**

Apply brakes evenly to prevent wheels from locking up. A balance between rear and front brake is best.

## Throttle Twist Grip

**Accelerate:** See Figure 4. Slowly twist throttle twist grip (7) backward (toward rear of motorcycle) to open the throttle.

**Decelerate:** Slowly twist throttle control grip forward (toward the front) to close the throttle.

## OFF/RUN Switch

### NOTE

*Required by law, the headlamp and tail lamps operate when the switch is in the RUN position.*

See OPERATION > RIGHT HAND CONTROL SWITCHES (Page 95). To start the engine, see OPERATION > STARTING THE ENGINE (Page 121).

## INSTRUMENTS

### Speedometer

#### ⚠ WARNING

Travel at speeds appropriate for road and conditions and never travel faster than posted speed limit. Excessive speed can cause loss of vehicle control, which could result in death or serious injury. (00008a)

**With fairing:** See Figure 22.

**Without fairing:** See Figure 23. The speedometer registers forward speed in miles per hour (U.S.) or kilometers per hour (international).

Instrument backlighting activates after a slight delay. Changes to ambient lighting, such as going through a tunnel, may briefly change backlighting.

### Tachometer

#### NOTICE

See OPERATING RECOMMENDATIONS section. Do not operate the engine above maximum safe RPM as shown under OPERATION (red zone on tachometer). Lower the RPM by upshifting to a higher gear or reducing the amount of throttle. Failure to lower RPM may cause equipment damage. (00159a)

**With fairing:** See Figure 22. The tachometer measures the engine speed in revolutions per minute (rpm x 100).

**Without fairing:** See Figure 23. A digital tachometer is displayed in the odometer window.

### Fuel Gauge

The fuel gauge indicates the approximate amount of fuel in the fuel tank.

**Without fairing:** The fuel gauge is on the left side of the fuel tank. See Figure 24.

**With fairing:** See Figure 22. The fuel gauge is on the instrument panel.

## Voltmeter

**With fairing:** See Figure 22. The voltmeter indicates the measured electrical system voltage. With the engine running above 1500 rpm, the voltmeter should register 13.0-14.5 volts with battery at full charge.

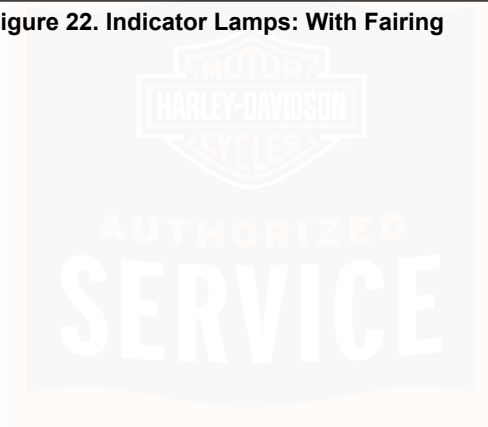
## Vehicle Information: With fairing

More information can be displayed within the infotainment system. See OPERATION > BOOM! BOX INFOTAINMENT SYSTEM (Page 110).



- |   |   |
|---|---|
| 1. Fuel gauge                               | 15. Auxiliary/fog lamp indicator (models with)      |
| 2. Low fuel                                 | 16. Not used  |
| 3. Speedometer                              | 17. Headlamp high beam                              |
| 4. Traction control (models with)           | 18. Low tire pressure/TPMS fault lamp (models with) |
| 5. Security/Fault indication                | 19. Cruise control                                  |
| 6. Not used                                 | 20. Check engine                                    |
| 7. Tachometer                               | 21. Neutral   |
| 8. Engine coolant temperature (models with) | 22. Gear indicator                                  |
| 9. Light sensor (not an indicator)          | 23. Odometer window                                 |
| 10. Battery discharge                       | 24. Oil pressure                                    |
| 11. Voltmeter                               | 25. Vehicle hold control (VHC) (models with)        |
| 12. Right turn signal indicator             | 26. Rain mode (models with)                         |
| 13. Not used                                | 27. Left turn signal indicator                      |
| 14. ABS (km/h also shown) (models with)     |   |

Figure 22. Indicator Lamps: With Fairing

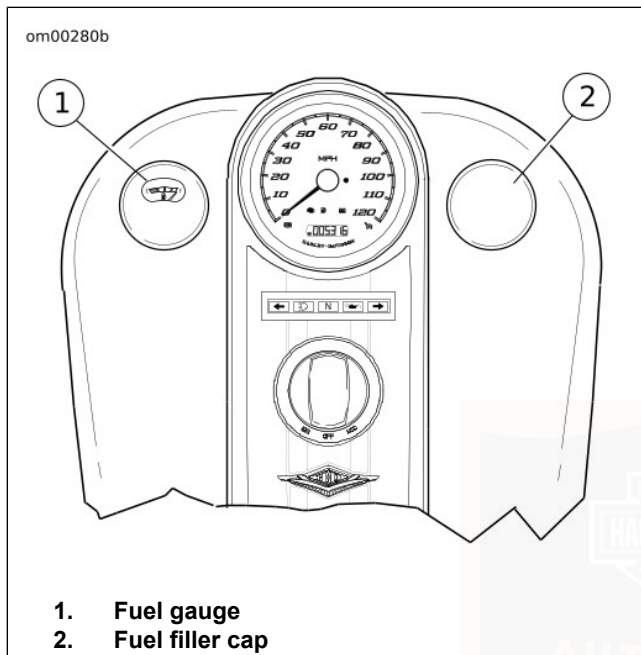


- |  |   |
|--|---|
| 1. Speedometer                                       | 10. Neutral   |
| 2. Vehicle hold control (VHC) (models with)          | 11. Oil pressure                                    |
| 3. Traction control (models with)                    | 12. Odometer window                                 |
| 4. Check engine                                      | 13. Not used  |
| 5. ABS icon (km/h ABS icon also shown) (models with) | 14. Low tire pressure/TPMS fault lamp (models with) |
| 6. Low fuel  | 15. Cruise control                                  |
| 7. Rain mode (models with)                           | 16. Battery discharge                               |
| 8. Turn signal indicator                             | 17. Not used  |
| 9. Headlamp high beam                                | 18. Security/Fault indication                       |

Figure 23. Indicator Lamps: Without Fairing



om00280b



1. Fuel gauge
2. Fuel filler cap

**Figure 24. Fuel Tank: Without Fairing**

## INDICATORS

### Check Engine Lamp

See Figure 22 and Figure 23. The check engine lamp indicates the condition of the engine/engine management system.

The check engine lamp normally comes on when the ignition is first turned on. During this time, the engine management system runs a series of self-diagnostics.

If the engine lamp does not turn off after starting the engine or comes on at any other time, see a Harley-Davidson dealer.

### Low Fuel Lamp

**Solid:** See Figure 22 and Figure 23. The low fuel warning lamp indicates when the gasoline in the tank reaches the low fuel level (approximate). See OWNER MANUAL > SPECIFICATIONS (Page 29) for the low fuel level. See OPERATION > ODOMETER WINDOW DISPLAYS (Page 99) for fuel range features.

**Flashing:** If the low fuel lamp flashes continuously or remains on after filling the fuel tank, see a Harley-Davidson dealer.

### Battery Discharge Lamp

See Figure 22 and Figure 23. The battery discharge lamp indicates overcharging or undercharging of the battery. Refer

to SERVICE PROCEDURES > BATTERY MAINTENANCE (Page 197).

### **Security/Fault Indicator Lamp**

See Figure 22 and Figure 23. The security lamp displays the status of the security system and electrical self-diagnostics for the motorcycle. Refer to OWNER MANUAL > SECURITY SYSTEM (Page 61) for security system operation.

**Flashing:** The security system is armed.

**Solid (security system armed):** The alarm has been activated.

**Solid (security system disarmed):** If the lamp remains on, see a Harley-Davidson dealer.

### **Turn Signal Indicator Lamps**

See Figure 22 and Figure 23.

**Flashing:** A turn signal is activated. When the 4-way hazard flashers are operating, both turn indicators flash simultaneously.

**Rapid flashing:** A turn signal bulb is not operating. Exercise caution and use hand signals. Replace inoperative components at earliest opportunity.

### **Headlamp High Beam Lamp**

See Figure 22 and Figure 23. The headlamp high beam lamp is on when the high beam or flash to pass switch is activated.

### **Neutral Lamp**

See Figure 22 and Figure 23. The neutral lamp is on when the transmission is in neutral.

### **Cruise Control Lamp**

See Figure 22 and Figure 23.

**Off:** Cruise control is not enabled.

**Orange:** Cruise control is enabled. Cruising speed is not set or has been disengaged.

**Green:** Cruising speed is set. Motorcycle speed is maintained by the cruise control system.

### **Auxiliary/Fog Lamp Indicator Lamp (models with)**

See Figure 22 and Figure 23.

The auxiliary/fog lamp indicator is on when the auxiliary/fog lamps are turned on.

## Gear Indicator

See Figure 22. On equipped models, the currently selected gear (1-6) is displayed in the odometer window. The gear indicator is calculated from the vehicle speed and engine speed. The gear indicator remains blank when the transmission is in neutral, the clutch lever is pulled in or the vehicle is not moving.

The gear indicator is momentarily inaccurate depending on rider clutch use characteristics and clutch wear. This condition can occur if the clutch is allowed to slip either due to excessive wear, misadjusted clutch or if the operator rides the clutch.

## ABS Lamp (models with)

See Figure 22 and Figure 23.

### ▲ WARNING

**If ABS lamp continues flashing at speeds greater than 5 km/h (3 mph) or remains on continuously, the ABS is not operating. The standard brake system is operational, but wheel lock up can occur. Contact a Harley-Davidson Dealer to have ABS repaired. A locked wheel will skid and can cause loss of vehicle control, which could result in death or serious injury. (00361b)**

**Slow flashing:** The ABS lamp begins flashing when the vehicle is turned on. The flashing lamp indicates that the

system is in self-diagnosis mode. It continues to flash until motorcycle speed exceeds 5 km/h (3 mph). ABS is not operational until the lamp turns off.

### ▲ WARNING

**Rapid flashing of the ABS lamp while the red fault indicator lamp is lit indicates a potential brake system fault. Move the motorcycle out of traffic applying both front and rear brakes to reduce speed and to stop motorcycle in a safe location. Contact a Harley-Davidson dealer for brake system repair. Operating a motorcycle with an improperly functioning brake system can adversely affect brake performance, which could result in death or serious injury. (08904a)**

**Rapid flashing with Solid security/fault indicator lamp:** This indicates a potential brake system fault. Apply both front and rear brakes to reduce speed and to stop motorcycle. The brake controls could feel stiff when applied. If this occurs, move the motorcycle to a safe location to stop. Service is required to correct the fault before continuing to ride. See a Harley-Davidson dealer for service.

**Solid:** Continuous illumination of the lamp indicates an ABS fault. The ABS is disabled and the brakes are operating as if they were non-ABS brakes. See a Harley-Davidson dealer for service.

**Table 31. ABS Lamp State**

<b>ABS LAMP</b>	<b>STATE</b>
ABS Lamp Flashes	START-UP: ABS Lamp bulb check.
ABS Lamp OFF	NORMAL OPERATION: After vehicle speed > 5 km/h (3 mph).
ABS Lamp Continuous	ABS not functioning.
ABS Lamp Rapid Flash with Solid Red Security/Fault Indicator Lamp	Brake System Fault, Do not ride.

### **Low Tire Pressure/TPMS Fault Lamp (models with)**

#### **▲ WARNING**

**Be sure tires are properly inflated, balanced, undamaged, and have adequate tread. Inspect your tires regularly and see a Harley-Davidson dealer for replacements. Riding with excessively worn, unbalanced, improperly inflated, overloaded or damaged tires can lead to tire failure and adversely affect stability and handling, which could result in death or serious injury. (00014b)**

See Figure 22 or Figure 23. The low tire pressure/TPMS fault lamp indicates when a low tire pressure condition or a TPMS system fault has occurred.

**Flashing (60 seconds, followed by solid lamp):** TPMS fault has been detected. The security lamp also turns on to show that a diagnostic trouble code exists. This event can occur for a variety of reasons, including loss of signal from the sensors or sensor battery failure. Tire pressure data may not be available while the lamp is lit. See a Harley-Davidson dealer for service.

**Solid:** The system has detected that one or more tires have low pressure. Models with a radio will also indicate details for this condition on the radio. Models without a radio will show information in the odometer window display. Safely stop the vehicle and use a tire pressure gauge to check the pressure of each affected tire. Inflate the tires according to specifications in BEFORE RIDING > CHECKING TIRE PRESSURE AND INSPECTING TIRES (Page 49) or as specified on the label on the frame downtube. The lamp will turn off when you begin riding the motorcycle with the correct pressure in the tires. Also refer to BEFORE RIDING > CHECKING TIRE PRESSURE AND INSPECTING TIRES (Page 49) to compensate tire pressures for tires that have recently been ridden. If tire pressure is adjusted per BEFORE RIDING > CHECKING TIRE PRESSURE AND INSPECTING TIRES (Page 49), readjust per recommendations at the earliest convenience.

#### **NOTE**

*Do not use the TPMS system as a pressure gauge when adding or removing air from a tire. Sensor data is sent to the*

*TPMS at varying intervals (depending on whether the vehicle is in motion, parked on the jiffy stand, or has a significant change in tire pressure). The tire pressure data may not refresh immediately when adding or removing air from the tire. Over or under-inflation can result.*

See OPERATION > ODOMETER WINDOW DISPLAYS (Page 99) for tire pressure data displayed in the odometer.

See OPERATION > BOOM! BOX INFOTAINMENT SYSTEM (Page 110) and the BOOM! BOX OWNER'S MANUAL for TPMS functions in the radio.

### **Traction Control Lamp (models with)**

See Figure 22 and Figure 23.

**Solid:** Traction control has been turned off.

**Slow flashing:** The traction control lamp begins flashing when the vehicle is turned on. The flashing lamp indicates that the system is in self-diagnosis mode. It continues to flash until motorcycle speed exceeds 5 km/h (3 mph). Traction control is not operational until the lamp turns off.

**Rapid flashing:** Traction control system active intervention.

**Off:** Traction control system is on.

**Solid with Security/Fault indication lamp On:** Continuous illumination of the lamp with the Security/Fault indication lamp

indicates a traction control fault. Traction control is disabled and the motorcycle is operating as traction control turned off. See a Harley-Davidson dealer for service.

### **Rain Mode Lamp (models with)**

See Figure 22 and Figure 23.

**Solid:** Traction control is in Rain Mode.

**Off:** Traction control is in Road Mode.

### **Vehicle Hold Control Lamp (models with)**

**Solid:** Vehicle Hold Control is engaged and maintaining brake pressure.

**Slow flashing:** Indication that brake pressure is being released, or is about to be released automatically. The rider should be prepared to engage the brake manually or drive off

### **Engine Coolant Temperature Lamp (models with)**

#### **▲ WARNING**

**Do not loosen or remove pressure cap when cooling system is hot. The cooling system is under pressure and hot coolant and steam can escape from pressure cap, which could cause severe burns. Allow motorcycle to cool before servicing the cooling system. (00091c)**

## NOTICE

**If the engine coolant temperature indicator lamp remains lit, always check the coolant level. If the coolant level is normal and the lamp is still lit, stop the engine at once and do not ride further until the trouble is located and the necessary repairs are made. Failure to do so may result in engine damage. (00158a)**

See Figure 22. On Twin-Cooled vehicles, the engine coolant temperature lamp is on when the coolant has exceeded threshold temperature.

Check and add coolant as necessary. See MAINTENANCE AND LUBRICATION > COOLING SYSTEM (Page 177). For other possible coolant system issues, see TROUBLESHOOTING > COOLING SYSTEM: TWIN-COOLED MODELS (Page 226).

If coolant level is sufficient and the lamp remains on, stop the engine immediately. See a Harley-Davidson dealer for service.

## Oil Pressure Lamp

### NOTICE

**If the oil pressure indicator lamp remains lit, always check the oil supply first. If the oil supply is normal and the lamp is still lit, stop the engine at once and do not ride further until the trouble is located and the necessary repairs are made. Failure to do so may result in engine damage. (00157a)**

See Figure 22 and Figure 23. The oil pressure lamp turns on when the ignition is turned on. The lamp remains on until the engine is started.

If the lamp is on while the engine is running, sufficient oil is not circulating through the engine.

Check and add engine oil as necessary. See MAINTENANCE AND LUBRICATION > CHECK ENGINE OIL LEVEL (Page 166). For other possible causes, see TROUBLESHOOTING > ENGINE (Page 223).

If the engine oil level is sufficient and the lamp remains on, stop the engine immediately. See a Harley-Davidson dealer for service.

## LEFT HAND CONTROL SWITCHES

### Trigger Switch

See Figure 25. **Vehicle off:** Press the trigger switch (1) to display the accumulated mileage in the odometer. **Vehicle in accessory/ignition mode:** Press the trigger switch to cycle through the odometer functions. Refer to Table 32.

### High Beam

See Figure 25. Press the high beam switch (2) to activate the high beam. The (blue) high beam indicator lamp is lit when the high beam is on. Refer to Table 32.

### Low Beam/Flash to Pass

**Low beam:** See Figure 25. Press the bottom of the low beam/flash to pass switch (3) to activate the low beam.

**Flash to pass:** When the low beam switch is on, press and release the flash to pass switch to flash the high beam before passing another vehicle. The high beam indicator lamp on the instrument cluster is illuminated as long as the flash to pass switch is pressed.

When in accessory, press the flash to pass switch to activate the headlamp. Refer to Table 32.

## Voice Recognition Switch

See Figure 25. The voice recognition switch (4) activates the voice recognition features on equipped vehicles. With a headset connected, press the voice command switch. The radio shows a list of available commands. Speak the desired command into the headset microphone. See the BOOM! BOX OWNER'S MANUAL.

## Cruise Control Switch

See Figure 25. The cruise control (5) switch is used to operate cruise control on equipped vehicles. See OPERATION > CRUISE CONTROL (Page 104) for detailed operation.

**CRUISE:** Press the CRUISE switch straight in to enable cruise control. The cruise control indicator lights orange. Pressing the CRUISE switch again turns off cruise control.

**SET/-:** With cruise control enabled, press SET/- to set the cruising speed. The cruise control indicator lights green. While at cruising speed, press SET/- to decrease the regulated speed.

**RESUME/+:** If cruise control is disengaged (such as a braking event), press RESUME/+ to resume the previous cruising speed. While at cruising speed, press RESUME/+ to increase speed.

## HOME/VOLUME/PREVIOUS/NEXT Switch

See Figure 25. The HOME/VOLUME/PREVIOUS/NEXT (6) five-way switch operates radio features on equipped vehicles. See the BOOM! BOX OWNER'S MANUAL.

**HOME:** Press the HOME switch straight in to transition to the HOME screen on the radio.

**VOLUME:** Press the switch up to increase volume or down to decrease volume.

**PREVIOUS/NEXT:** Press the switch to the left or right to seek up/down for a radio station or to select the previous/next media file.

## Left Turn Signal

**Activate:** See Figure 25. Press the left turn signal switch (7) to activate the left turn signal. Refer to Table 32.

### Cancel:

**Manual Operation:** Press the left turn signal switch to cancel the right turn signal.

**Automatic Operation:** The turn signal lamps automatically cancel when a full turn has been detected based on speed, acceleration and turn completion.

The lamps also cancel if the turn signal has been activated for a prolonged period (20 flashes) while the motorcycle speed

is greater than 7 mph (11 km/h). If the motorcycle is stopped or moving slower than this speed, the turn signal continues flashing.

### NOTE

*Front turn signal lamps also function as running lamps. This feature may not be available in all markets.*

## Horn

See Figure 25. The horn is operated by pressing the horn switch (8). The horn can be activated for up to 10 seconds at a time. If the horn switch is held for a longer period, the horn automatically deactivates. Refer to Table 32.

## Traction Control Switch

See Figure 25. The traction control switch (9) activates and deactivates the traction control system and switches traction control modes on equipped vehicles. Refer to Table 32.

**Disable:** Press switch for more than 1 s with engine running and vehicle stopped.

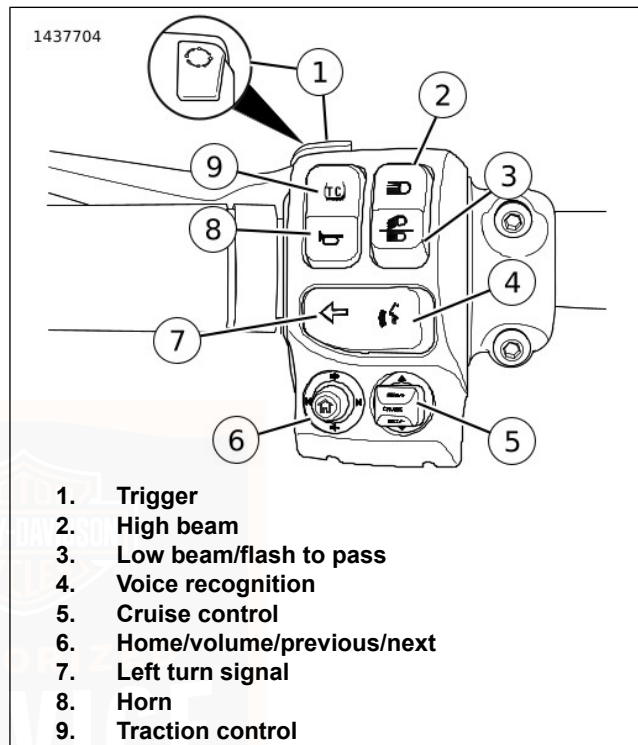
**Enable:** Press switch at anytime to resume traction control operation. The system will be enabled to the last active Traction Control mode.

**Switch mode:** When Traction Control is enabled press switch at any time to alternate between Rain and Road mode.

**NOTE**

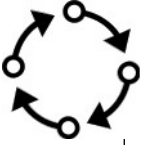




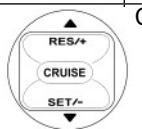
Traction control is automatically enabled at each ignition start cycle. The system will be enabled to the last active Traction Control mode.

For more information on traction control, see OPERATION > TRACTION CONTROL (Page 130).


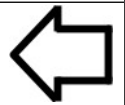




**Figure 25. Left Hand Switch Module (typical)**

**Table 32. Left-Hand Control Switches**

SWITCH	NAME	FUNCTION
	Trigger	Press the switch to alternate odometer displays.
	High beam	Press the switch to switch the headlamp to high beam.
	Low beam/ Flash to pass	Press the switch to switch the headlamp to low beam. Press and release to flash the high beam.
		In ACC, press to activate the headlamp.
	Voice recognition	Initiates a voice recognition session.
	Cruise control	Three-way switch, operates cruise control functions.

**Table 32. Left-Hand Control Switches**

SWITCH	NAME	FUNCTION
	Home/volume/ previous/next	Five-way switch, operates radio functions.
	Left turn	Press the switch to signal a left turn.
	Horn	Press the switch to sound the horn.
	Traction control	Press the switch to deactivate and activate traction control.

## RIGHT HAND CONTROL SWITCHES

### Hazard Warning 4-Way Flasher

See Figure 26. The hazard switch (1) is used to leave a stranded motorcycle in the 4-way flashing mode. With the flashers, the motorcycle can be left with the ignition off until assistance is found. Refer to Table 33.

1. With the OFF/RUN switch in the run position, press on the hazard warning triangle to activate the 4-way flashers.

**NOTE**

- *The fob must be present when turning on the 4-way flashers and when canceling the flashers.*
  - *The four-way flashers will operate when the vehicle is tipped over regardless of OFF/RUN switch position. See OPERATION > STARTING AFTER TIPOVER (Page 122).*
2. Turn OFF/RUN switch to the off position. The 4-way flashers continue for 2 hours or until cancelled by the rider.
  3. To cancel, turn the OFF/RUN switch to the run position. Press the warning triangle above the start switch.

## OFF

See Figure 26. Press the engine OFF/RUN switch to off (2) to shut off the engine. Refer to Table 33.

## RUN

See Figure 26. Push the engine OFF/RUN switch to run (3) to enable engine start and run. The engine OFF/RUN switch must be in the run position to start or operate the engine. Refer to Table 33.

## Right Turn Signal

### Activate:

See Figure 26. Press the right turn signal switch (4) to activate the right turn signal. Refer to Table 33.

### Cancel:

Manual Operation: Press the right turn signal switch to cancel the right turn signal.

Automatic Operation: The turn signal lamps automatically cancel when a full turn has been detected based on speed, acceleration and turn completion.

The lamps also cancel if the turn signal has been activated for a prolonged period (20 flashes) while the motorcycle speed is greater than 7 mph (11 km/h). If the motorcycle is stopped or moving slower than this speed, the turn signal continues flashing.

**NOTE**

*Front turn signal lamps also function as running lamps. This feature may not be available in all markets.*

## CURSOR/SELECT Switch

See Figure 26. The CURSOR/SELECT five-way switch (5) operates radio features on equipped vehicles. See the BOOM! BOX OWNER'S MANUAL. Refer to Table 33.

**SELECT:** Press the SELECT switch straight in to select or toggle a feature on the radio screen.

**CURSOR:** Press the switch in the desired direction to move the cursor or selection on the radio screen.

## Back switch

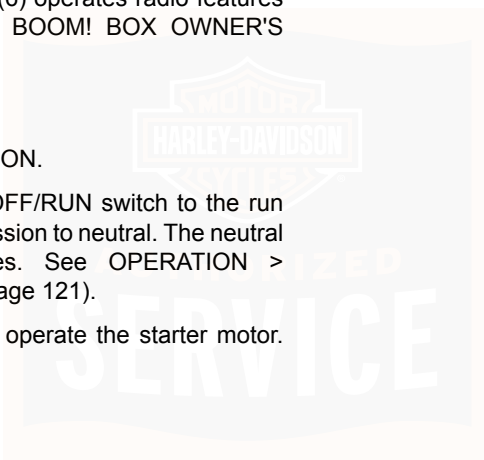
See Figure 26. The back switch (6) operates radio features on equipped vehicles. See the BOOM! BOX OWNER'S MANUAL. Refer to Table 33.

## Start

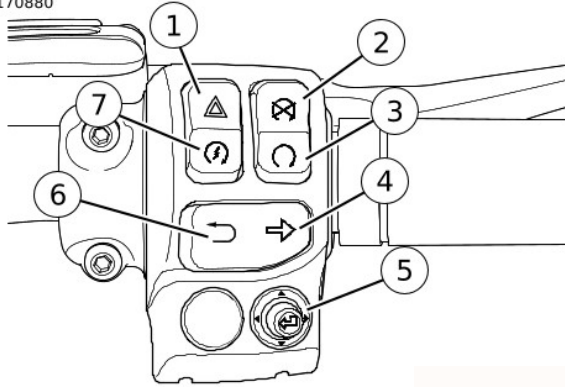
1. Turn ignition switch to IGNITION.
2. See Figure 26. Switch the OFF/RUN switch to the run position (3). Shift the transmission to neutral. The neutral (green) indicator illuminates. See OPERATION > STARTING THE ENGINE (Page 121).
3. Press the start switch (7) to operate the starter motor. Refer to Table 33.

## NOTE

- *When the starter is activated, the headlamp is momentarily turned off to reduce battery load.*
- *If the engine does not start, the starter motor runs for ten seconds and stops. Release the start switch. Press the start switch to try again. After several unsuccessful attempts to start the engine, see a Harley-Davidson dealer.*








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1. Hazard warning
2. Off
3. Run
4. Right turn signal
5. Cursor/select
6. Back
7. Start

Figure 26. Right Hand Switch Module (Typical)

Table 33. Right Hand Control Switches

SWITCH	NAME	FUNCTION
	Hazard	Press to activate the 4-way flashers.
	Off	Press to stop the engine or to prevent the engine from starting.
	Run	Press to allow the engine to start.
	Right turn	Press to signal a right turn.
	Cursor/Select	Five-way switch, operates radio functions.

**Table 33. Right Hand Control Switches**

SWITCH	NAME	FUNCTION
	Back	Press to go back to previous screen on radio.
	Start	Press to start the engine.

## ODOMETER WINDOW DISPLAYS

### NOTICE

**Never attempt to tamper with or alter the vehicle odometer. This is illegal. Tampering with or altering a vehicle odometer may cause equipment damage. (00160a)**

### NOTE

*The trigger switch is located on the front of the left hand control. See Figure 25.*

## Odometer

The odometer shows the total accumulated mileage for the motorcycle. Press the trigger switch to cycle through different odometer functions. The time (models without fairing) and odometer can be displayed while the motorcycle is turned off by pressing the trigger switch.

**Changing units (models without fairing):** With odometer displayed, press and hold the trigger switch until the units change to MI or KM. All odometer functions will display the selected units.

**Changing units (models with fairing):** Change the settings in the radio to ENGLISH UNITS or METRIC. All radio and odometer functions will display the selected units. See BOOM! BOX OWNER'S MANUAL.

## Trip Odometers

The two trip odometers (A and B) display the total accumulated mileage since they were last reset. To check, press and release the trigger switch until the desired trip odometer (A or B) is displayed.

**Reset:** With the desired trip odometer displayed (A or B), press and hold the trigger switch until the selected trip odometer resets to zero.

## Fuel Range

The fuel range display shows the approximate mileage available with the amount of fuel left in the fuel tank. The range display is only updated when the vehicle is moving.

**Display Fuel Range:** With the ignition switch in the ACCESSORY or IGNITION position, press the trigger switch until fuel range is displayed. The fuel range is indicated by

the letter "R" in the left side of the display. The calculated remaining distance (miles or kilometers) to empty is displayed, based on the amount of fuel in the tank.

**Low Fuel:** See OWNER MANUAL > SPECIFICATIONS (Page 29). The fuel range is automatically displayed in the odometer window when the low fuel lamp is on. When fuel range drops to 10 miles or 10 kilometers remaining, the odometer window displays "LF" to indicate that the motorcycle is nearly out of fuel, the distance displayed next to the "LF" shows distance traveled since low fuel light activated. Refuel as soon as possible.

**Turn Off Automatic Low Fuel Popup:** With the fuel range displayed, hold the trigger switch until the fuel range flashes two times. To turn this feature back on, hold the trigger switch until the fuel range flashes once.

**Reset:** Resetting the low fuel warning lamp and fuel range requires sufficient fuel in the tank and an ignition cycle change (IGNITION-OFF-IGNITION).

Adding at least 7.6 L (2 USgal) of fuel allows the fuel range to update. The fuel range slowly updates over the next 48 km (30 mi) after refueling.

**Battery Reconnection and Initialization:** If the battery is disconnected and reconnected, the gauge requires approximately a half tank of fuel to initialize fuel range functionality.

## Digital Tachometer: Without Fairing

Press and release the trigger switch until the digital tachometer is displayed. The odometer window briefly displays a "GEAR/RPM" message, then displays the current gear and engine speed (revolutions per minute).

## Time: Without Fairing

See Figure 28. Time is displayed in the odometer window. Perform the following steps to configure time.

1. Turn the ignition switch to ACCESSORY or IGNITION.
2. Repeatedly press the trigger switch until the time is displayed.
3. **12HR/24HR:** Press and hold the trigger switch until 12HR begins to flash. Press the trigger switch to toggle between 12 hour (12HR) or 24 hour (24HR) clock display.
4. **Hour:** Press and hold the trigger switch until the hour is flashing. Repeatedly press the trigger switch to advance hours to the correct time.
5. **Minutes:** Press and hold the trigger switch until the minutes begin flashing. Repeatedly press the trigger switch to advance minutes to the correct time.
6. **AM/PM:** If 12HR was selected, press and hold the trigger switch until AM/PM begins flashing. Press the trigger switch to toggle between AM or PM.

### NOTE

*AM or PM does not appear in the regular time display. The motorcycle uses the selection for diagnostic purposes.*

7. Press and hold the trigger switch to save time settings.
8. Turn ignition switch OFF.

## Tip Indicator

### ▲ WARNING

**If tip occurs, check all controls for proper operation. Restricted control movement can adversely affect the performance of the brakes, clutch or ability to shift, which could result in loss of vehicle control and death or serious injury. (00350a)**

See Figure 29. If the motorcycle is tipped over, the word "tiP" appears in the odometer window. The engine will not start until the tip condition is reset. See OPERATION > STARTING AFTER TIPOVER (Page 122) to reset.

## No Fob Message

See Figure 29. If the motorcycle has a security system and is driven off leaving the fob behind, 'NO FOB' temporarily displays in the odometer window.

Without the fob, the motorcycle can only be started with a manual PIN entry to disarm the security system. See SECURITY SYSTEM > ARMING AND DISARMING (Page 66).

## Sidestand Message

See Figure 29. Some vehicles have a jiffy stand interlock feature. A "SidEstAnd" message scrolls across the odometer if the jiffy stand is lowered while the motorcycle is in gear or while riding. See BEFORE RIDING > OPERATING JIFFY STAND (Page 56).

**Clearing message (before starting motorcycle):** Place transmission in neutral or raise jiffy stand.

**Clearing message (while riding):** Safely bring the motorcycle to a stop. Raise jiffy stand.

**Clearing message (temporarily):** Press the trigger switch. The message clears momentarily before displaying again.

## No ABS Message

See Figure 29. If the motorcycle is equipped with a Non-ABS brake system, a 'NO AbS' message will display in the odometer window during instrument test after ignition turned ON. See OPERATION > BRAKE SYSTEM (Page 125).

## Tire Pressure

See Figure 29. If equipped, the TPMS monitors and displays the tire pressure for both the front and the rear wheels in the odometer window.

A sensor is attached inside each tire at the valve stem. The sensors send a signal to the motorcycle at varying intervals depending on whether the vehicle is in motion or parked.

**Display tire pressure:** Press the trigger switch to display the front (FR) tire pressure. Press the trigger switch again to display the rear (RR) tire pressure.

**Low tire pressure:** When low tire pressure is detected, the odometer window shows the affected tire and pressure data. Safely stop the vehicle and use a tire pressure gauge to check the pressure of each affected tire. Inflate the tires according to specifications in BEFORE RIDING > CHECKING TIRE PRESSURE AND INSPECTING TIRES (Page 49) or as specified on the label on the frame downtube.

### NOTE

- *Do not use the TPMS system as a pressure gauge when adding or removing air from a tire. Sensor data is sent to the TPMS at varying intervals (depending on whether the vehicle is in motion, parked, or has a significant change in tire pressure). The tire pressure data may not refresh immediately when adding or removing air from the tire. Over- or under-inflation can result.*
- *BEFORE RIDING > CHECKING TIRE PRESSURE AND INSPECTING TIRES (Page 49) indicates the specified pressure for tires when they are cold (vehicle parked for at least three hours). Tire pressure will increase as the tires get warm.*

**No tire pressure data:** If the system does not have information for the current tire pressure, the odometer window displays dashes for the affected tires (such as FR -- ). This can be caused by lack of a recent signal from the TPMS sensors or other malfunction. Check the low tire pressure/TPMS malfunction lamp. See OPERATION > INSTRUMENTS (Page 82).

SERVICE

1. Odometer
2. Trip odometers (A, B, reset)
3. Fuel range (low fuel)
4. Digital tachometer (without fairing)
5. Trigger switch (left hand control)

Figure 27. Odometer Functions

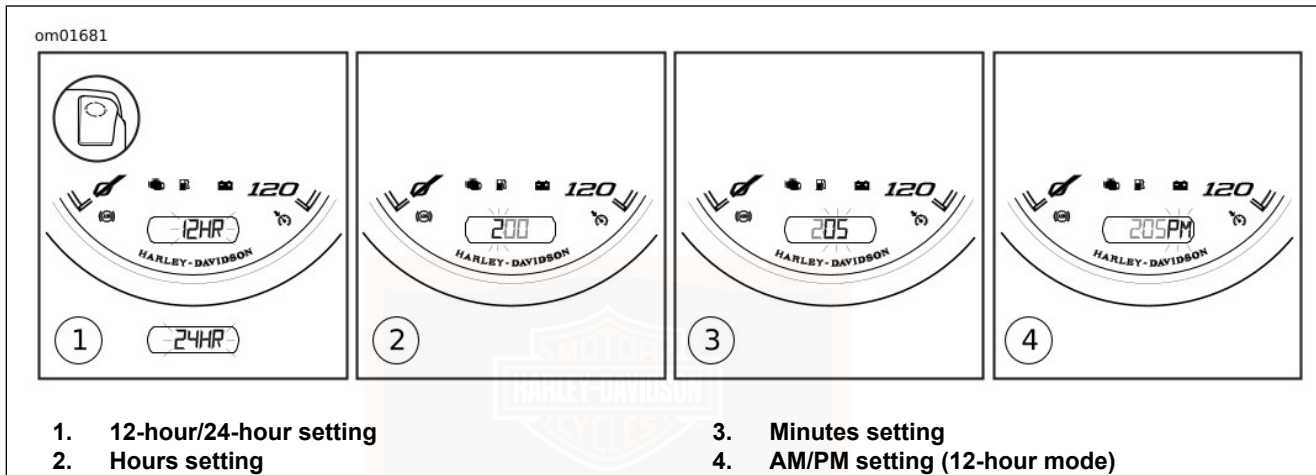


Figure 28. Setting Time (without fairing)

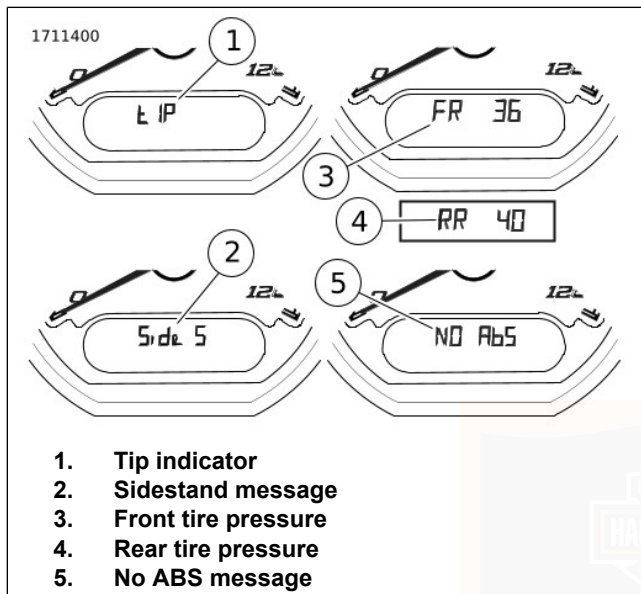


Figure 29. Tip, Sidestand, TPMS and No ABS Messages

## CRUISE CONTROL

### NOTE

Cruise control is optional on some models and may not have been installed.

### ▲ WARNING

Do not use the cruise control system in heavy traffic, on roads with sharp or blind curves or on slippery roads of any kind. Using the cruise control in these circumstances can cause loss of control, which could result in death or serious injury. (00083a)

### ▲ WARNING

Travel at speeds appropriate for road and conditions and never travel faster than posted speed limit. Excessive speed can cause loss of vehicle control, which could result in death or serious injury. (00008a)

## Turn Cruise On

### NOTE

Cruise control operates when:

- At least 10 seconds have lapsed since the engine was started.
- Vehicle speed is between 40–145 km/h (25–90 mph) in second or higher gear.

See Figure 30. Press the CRUISE switch to turn on cruise (1). When on, the cruise icon in the speedometer face glows amber.

## Set Cruise Speed

See Figure 30. When the motorcycle reaches your intended speed, press the SET/- switch to set the cruise speed (2). The amber cruise icon changes to green.

If necessary, adjust the cruise speed to match the speed limit or traffic conditions:

### Increase/Decrease Cruise

Tapping the RES/+ switch increases speed by 1.6 km/h (1 mph). Holding the switch down gradually increases cruise speed.

Tapping the SET/- switch decreases speed by 1.6 km/h (1 mph). Holding the switch down gradually decreases cruise speed.

### Disengage Cruise

See Figure 30. To drop out of cruise speed, roll the throttle closed through the roll-off switch (3).

Cruise also disengages when the rider:

- Squeezes the front brake lever or presses the rear brake pedal.
- Squeezes the clutch lever.
- Rolls the throttle open more than 16 km/h (10 mph) above the set speed.

### Resume Cruise

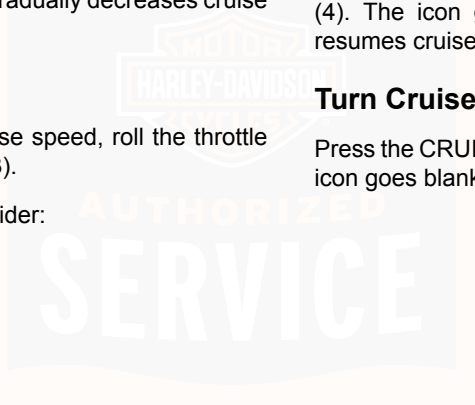
#### NOTE

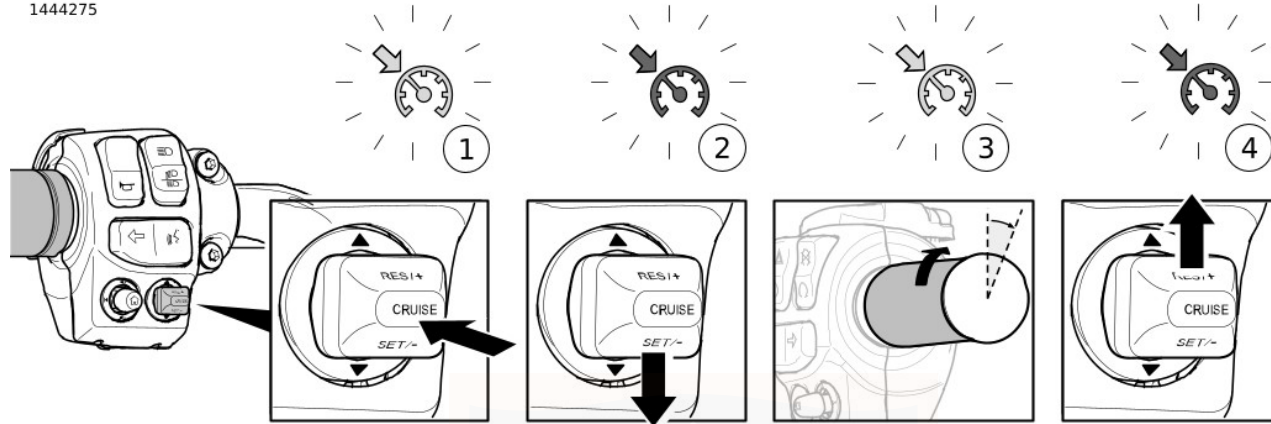
*If the current speed is more than 24 km/h (15 mph) below the cruise speed, cruise will not resume.*

See Figure 30. If cruise has been disengaged yet the cruise indicator is amber, pressing the RES/+ switch resumes cruise (4). The icon glows green. The motorcycle automatically resumes cruise at the set speed.

### Turn Cruise Off

Press the CRUISE switch to turn off cruise control. The cruise icon goes blank.





- |   |   |
|---|---|
| 1. Cruise on/off (CRUISE) (amber indicator) | 3. Disengage cruise (amber indicator)     |
| 2. Set speed (SET/-) (green indicator)      | 4. Resume speed (RES/+) (green indicator) |

**Figure 30. Cruise Control (typical)**

## ELECTRONIC THROTTLE CONTROL (ETC)

This motorcycle has an Electronic Throttle Control (ETC). Instead of using a mechanical cable connection to the throttle body, this technology uses redundant grip sensors to indicate rider requested throttle position to the Electronic Control

Module (ECM). The ECM then regulates proper fuel/air intake and ignition timing based on the rider's actions.

The Electronic Control Module (ECM) monitors the status of the grip sensors, throttle plate actuation and airflow. If Trouble Codes are detected, the ECM disables cruise control,

illuminates the check engine lamp and will transition to one of the following modes.

### **ETC Limited Performance Mode**

The rider experiences near-normal operation. The motorcycle operates with provisions to guard against unintended acceleration.

### **ETC Power Management Mode**

The throttle plate actuator returns to an "idle detent" or "limp-home" position, which provides enough torque to achieve speed of about 40 km/h (25 mph). The motorcycle's response to grip sensor input is reduced.

### **ETC Forced Idle Mode**

The throttle plate actuator is forced to a "fast idle" position, which provides enough torque to crawl, but not enough torque to operate at traffic speeds.

### **ETC Forced Shut Down Mode**

The engine is forced to shut down.

## **ACCESSORY SWITCH**

### **NOTICE**

**It is possible to overload the vehicle's charging system by adding too many electrical accessories. If the combined electrical accessories operating at any one time consume more electrical current than the vehicle's charging system can produce, the electrical consumption can discharge the battery and cause damage to the vehicle's electrical system. (00211d)**

See Figure 33. The accessory switch controls power to the accessory connector under the left side cover. See a Harley-Davidson dealer or [www.harley-davidson.com](http://www.harley-davidson.com) for electrical accessories that fit your motorcycle.

**With nacelle:** See Figure 31. On models with an accessory switch, the switch is on the right side of the nacelle.

**With fairing:** See Figure 32. A panel for accessory switches is next to the ignition switch on the dash panel. Switches can be added for installed accessories. The maximum load per switch is 2 amps.

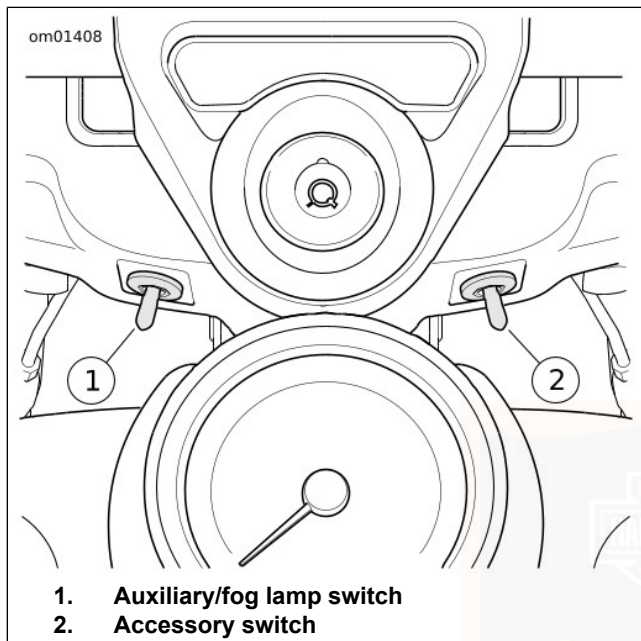


Figure 31. Nacelle Switches (models with)

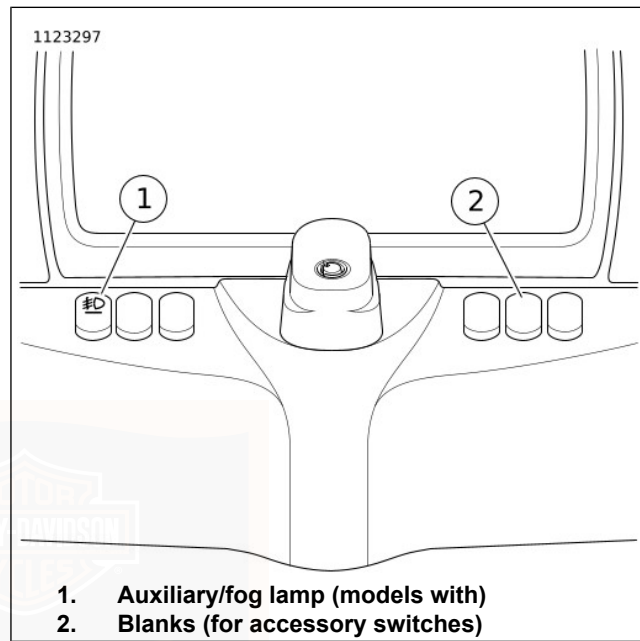
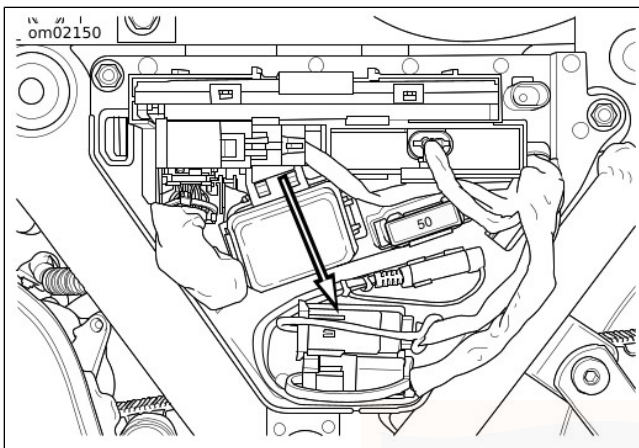


Figure 32. Fairing Switches



**Figure 33. Accessory Connector (under left side cover)**

## AUXILIARY/FOG LAMPS

Models with auxiliary/fog lamps provide additional light to the road and surrounding environment in dark or rainy conditions. The lamps also give the motorcycle more visibility to other motorists.

**With nacelle:** See Figure 31. On models with an accessory switch, the switch is on the left side of the nacelle.

**With fairing:** See Figure 32. The switch is on the left side of the dash panel. When the lamps are on, the auxiliary/fog lamp

indicator is displayed in the instruments as shown in Figure 22.

**Domestic/Canada configurations:** The auxiliary/fog lamps are configured to automatically turn off when the high beam headlamp is turned on, except as required by state/province.

Auxiliary/fog lamps can be configured to turn on or off with high beam by the dealer, based on legal requirements for each location.

## HEATED HAND GRIPS

See Figure 34. Models with heated hand grips have a variable heat control dial on the end of the left-hand grip.

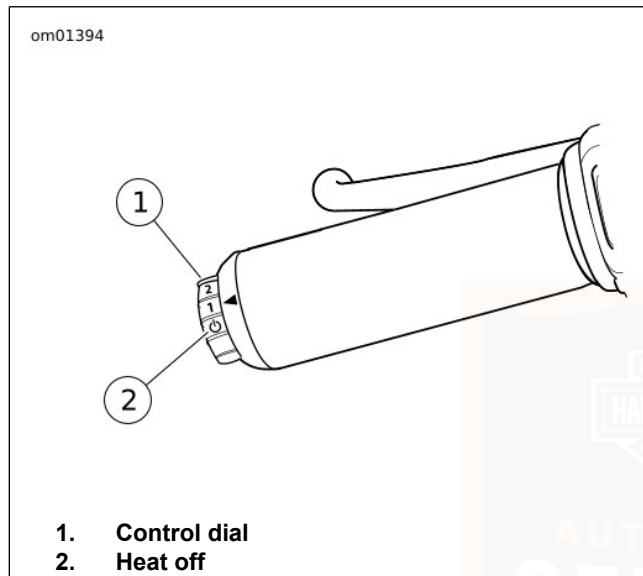
Rotate the control dial to align the desired setting with the arrow on the grip. The heat settings range from 1 (minimum) to 6 (peak). Rotate to the off icon to turn off heat.

The hand grips are thermostatically-controlled, providing a constant grip temperature regardless of changes in the outside temperature. To prevent battery drain, heated hand grips should only be used while the engine is running.

The sensor for thermostatic control is housed in the left-hand grip. Maintaining consistent hand contact with both left and right-hand grips produces the most consistent results. If the hand grips are not producing heat, see TROUBLESHOOTING > HEATED HAND GRIPS (Page 227).

**NOTE**

Allow approximately 20 minutes for grips to reach final operating temperature.



**Figure 34. Heated Hand Grips**

## BOOM! BOX INFOTAINMENT SYSTEM

**▲ WARNING**

Set volume levels and other controls on audio and electronic devices before riding. Distractions can lead to loss of control, resulting in death or serious injury. (00088b)

**▲ WARNING**

Do not select a volume level that blocks out traffic noise or interrupts the concentration necessary for safe operation of the motorcycle. Distractions or a volume level that blocks out traffic noise could cause loss of control resulting in death or serious injury. (00539b)

**NOTE**

- See *BOOM! BOX OWNER'S MANUAL* for a complete description of features and instructions for operation.
- Perform system set-up and get familiar with the controls and features of the infotainment system before operating the motorcycle on the road.
- For additional instruction and information, see an authorized Harley-Davidson dealer and online resources at [www.harley-davidson.com/touring](http://www.harley-davidson.com/touring).

See Figure 35 or Figure 36. Some vehicles have a Boom! Box infotainment system. The system operates while the

ignition switch is in the IGNITION or ACCESSORY position.  
The following controls are on the radio.

## GTS

A full version of the Boom!™ Box GTS owner's manual is downloadable at [www.harley-davidson.com](http://www.harley-davidson.com) or [www.H-D.com/BoomBoxGTS/manual](http://www.H-D.com/BoomBoxGTS/manual).

Refer to Table 34 for infotainment button functions.

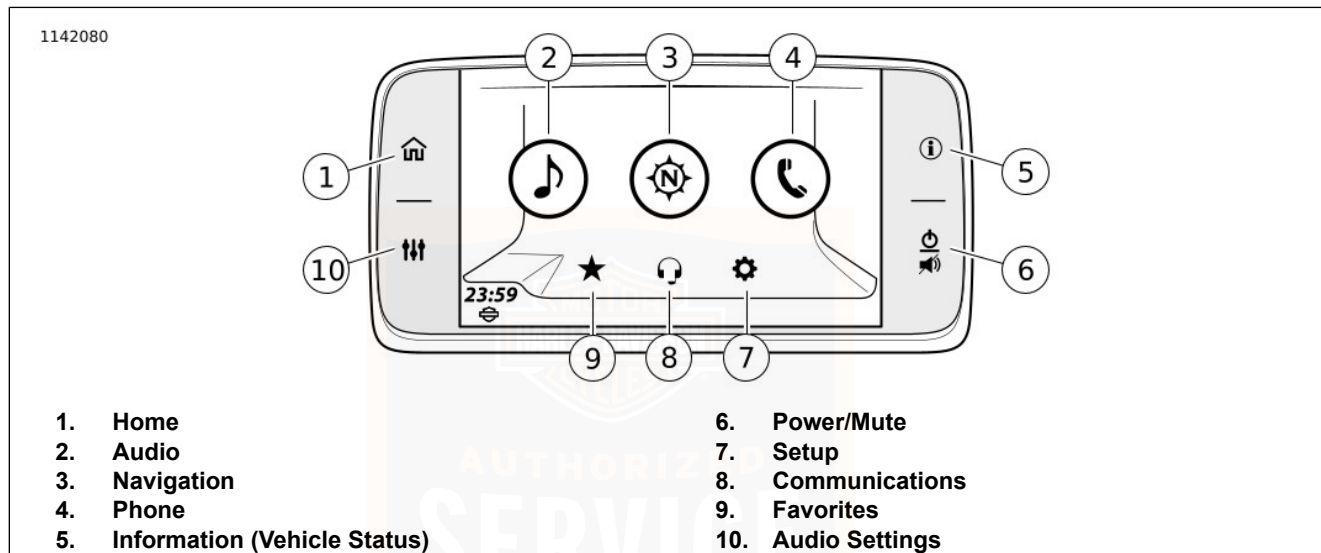


Figure 35. Faceplate Home Screen Selections

**Table 34. Faceplate Home Screen Selections**

<b>Press</b>	<b>Result</b>
1 [Home]	Displays Home screen. Toggle between Home screen and active media. <b>Available selections:</b> Audio, Navigation, Phone, Setup, Communications, Favorites.
2 [Audio]	Displays active source with audible content information. <b>Available selections:</b> FM, AM, WB (weather band). <b>Optional selections:</b> When connected: iPod, USB Media, Bluetooth Audio. If equipped: SiriusXM.
3 [Navigation]	Displays map with current position. <b>Available selections:</b> Search, Menu, Stop Route, Highway Services (shows only on highways), Data Wing (right and left), Zoom (in and out). <b>Informational display:</b> Current Street, Compass, Next Maneuver, Distance to Next Maneuver, Next Street, Repeat.
4 [Phone]	Displays menus for staying connected. <b>Available selections:</b> Calls, Contacts, Messages, Keypad, SOS.
5 [Info]	Displays vehicle status. <b>Available selections:</b> Info, Engine/Fuel Info, Ride Summary, TPMS (models with).
6 [Mute/Power]	Toggles power on and off (hold for three seconds). Silence or pause audio.
7 [Setup]	Configure system settings. <b>Do before riding the motorcycle.</b> <b>Available selections:</b> Audio Settings, Display, Global Presets, Keyboard, Bluetooth setup, Wireless Headset, Units, Clock, Rear Controls, System Information, Language, Projection Mode.
8 [Communication]	Displays enabled communication devices. <b>Available selections:</b> Intercom (when enabled), Citizen Band (CB, if equipped).
9 [Favorites]	Displays saved favorites. <b>Available selections:</b> Tuner, Media, Phone, Destination.

**Table 34. Faceplate Home Screen Selections**

Press	Result
10 [Audio Setup]	Displays audio setting screen. <b>Available selections:</b> Bass, Treble, Audio Routing, Fade, Volumes.

### 4.3

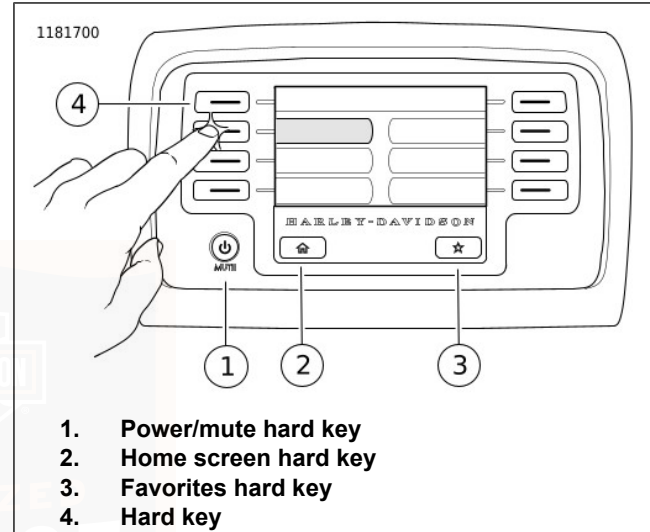
A full version of the Boom!™ Box 4.3 owner's manual is downloadable at [www.harley-davidson.com](http://www.harley-davidson.com) or [www.h-d.com/boombox/manuals](http://www.h-d.com/boombox/manuals).

**Power/Mute hard key (1):** Press and hold to turn the system on/off. Press briefly to mute audio and pause media.

**Home screen hard key (2):** Press to display the home screen.

**Favorites hard key (3):** Press to display the saved favorites.

**Hard keys (4):** Some systems have hard keys. Press the key to select items on the screen.



**Figure 36. Boom! Box 4.3 Faceplate Controls**

## HEADSET CONNECTION

### NOTICE

**Do not pull on the cord to remove the headset from the socket. Pull on the headset jack to disconnect the headset from the socket. (00174a)**

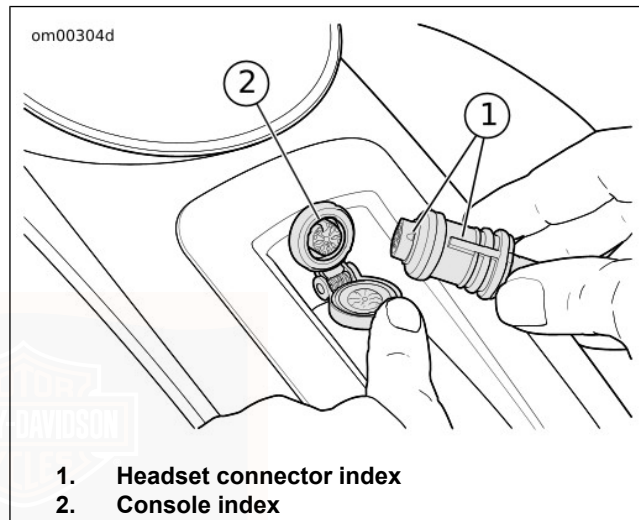
See Figure 37 and Figure 38. Some vehicles have a rider headset connector on the fuel tank panel and a passenger headset connector on the left speaker pod. The headsets are used to operate the CB, intercom, voice recognition and other features on equipped models.

Use the Harley-Davidson 7-pin DIN headset that is supplied with equipped models or purchased from a Harley-Davidson dealer. Other headset microphones will not work. See the instructions that are included with the headset to install in a helmet.

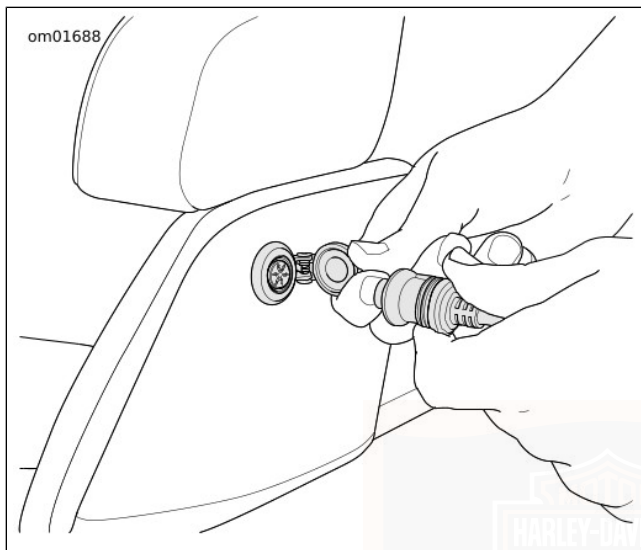
Connect the headset by aligning the connector index on the headset connector with the console index on the connector.

Audio routing for the headset is controlled through the radio. Volume and push-to-talk functions are done using the rider and passenger hand controls. See the BOOM! BOX OWNER'S MANUAL.

The socket caps remain shut when not in use to prevent dirt and water from entering the socket. Close both socket caps before washing the motorcycle.



**Figure 37. Rider Headset Connector (typical)**



**Figure 38. Passenger Headset Connector**

## **PASSENGER CONTROLS**

See Figure 39. Some vehicles have passenger controls on the right side of the Tour-Pak. These controls allow the passenger to operate functions in the infotainment system. See **BOOM! BOX OWNER'S MANUAL** for detailed instructions.

### **Mode Switch**

**MODE:** Press switch straight in to select the next available audio source.

**UP/DN:** Press switch up/down to select the previous/next radio station or media file.

### **Push-To-Talk (PTT)/Volume (VOL) Switch**

**PTT:** Press switch to transmit over CB or intercom.

**VOL+/VOL-:** Press switch up/down to raise/lower the volume to the passenger headset.

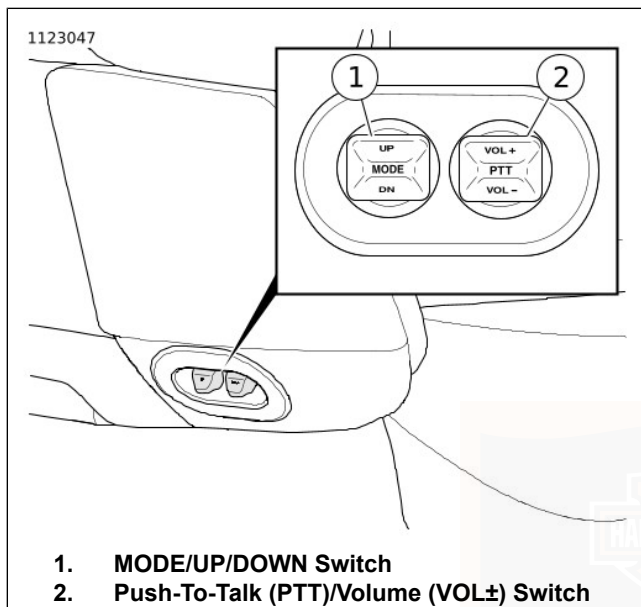


Figure 39. Passenger Controls

## RADIO ANTENNA

The radio antenna mast is threaded on a mount at the rear of the vehicle. When installing, hand-tighten only.

## MEDIA COMPARTMENT

The media compartment has a USB port to connect with a phone, media device or USB drive. Use an interface cable to connect with these devices. The USB port is powered and operational when the vehicle is turned on or in accessory mode.

Devices can be added or removed while the radio is on. However, when importing/exporting files or installing updates to the radio, do not disconnect the USB device until the task has completed.

Keep the compartment door closed while riding to prevent items from falling out. Remove valuable items from the media compartment before leaving the vehicle unattended.

### NOTE

*Do not use media players with hard drives. Vibration may cause internal damage.*

## Media/Storage Compartments: Frame mounted fairing

See Figure 40. Storage compartments are on the right and left side of the fairing. The USB port for media devices is in the right side compartment.

**Open:** Pull up on the compartment door as shown.

**Cleaning:** The rubber or fabric insert in the compartment is attached with hook and loop fastening tape and can be removed for cleaning.

### **Media Compartment: Fork mounted fairing**

#### *NOTE*

*The Electra Glide® Standard (FLHT) media compartment does not contain a USB cable or cradle.*

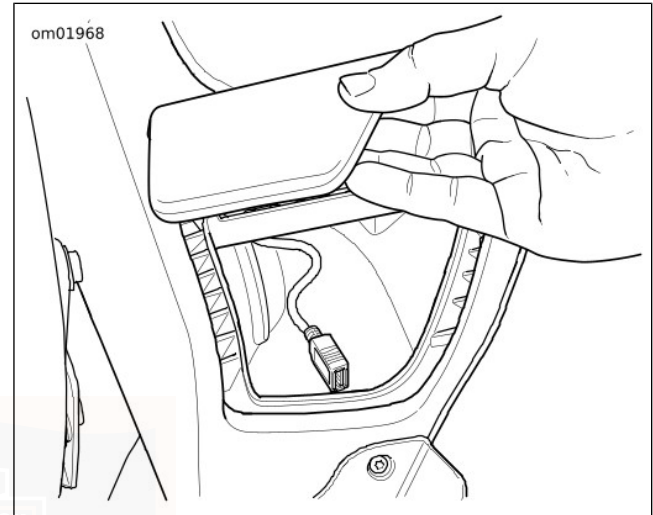
See Figure 41 and Figure 42. Other vehicles have a media compartment on the right side of the radio as shown. Insert the phone or media device into the foam cradle to secure the device and isolate it from vibration.

**Open:** Push lower portion of door and release to open.

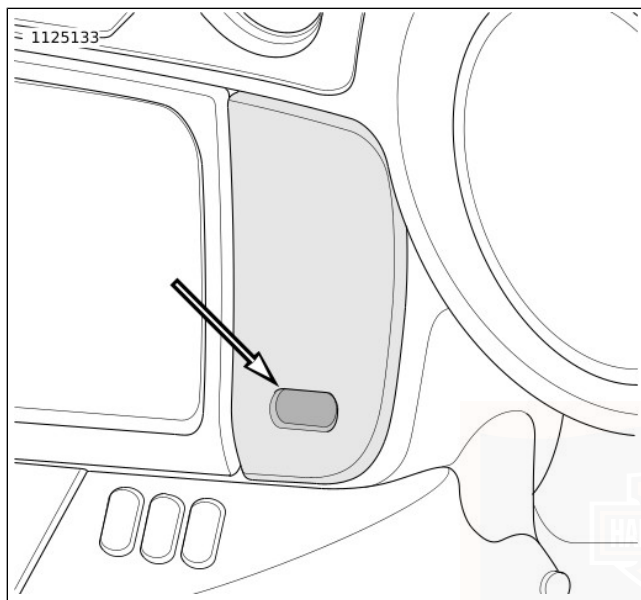
**Close:** Firmly push the door shut until the latch engages.

**Reset door latch:** If compartment door was forced open or is not latching properly, reset the door latch. Push the door shut. Open the door. Close the door again to engage the latch mechanism.

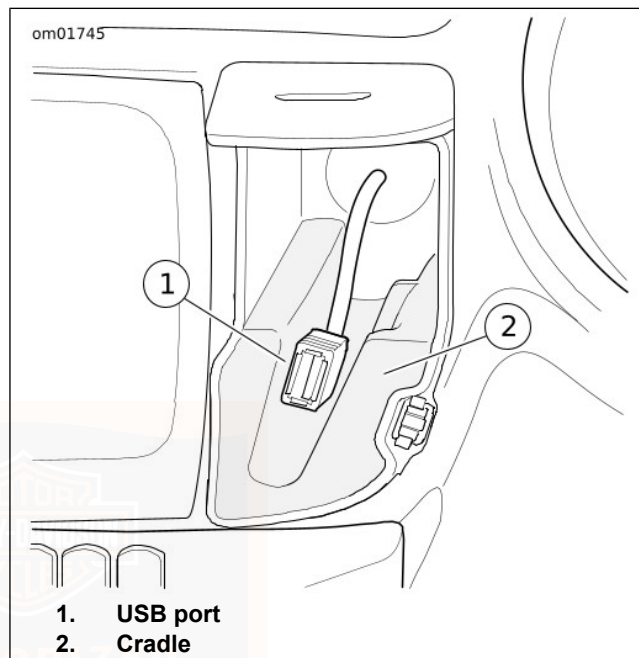
**Cleaning:** The cradle can be removed for cleaning or to assist with installing or removing a device from the compartment.



**Figure 40. Storage/Media Compartment: Frame Mounted Fairing**



**Figure 41. Media Compartment: Fork Mounted Fairing**



**Figure 42. USB Port: Fork Mounted Fairing**

## **POWER PORT**

See Figure 43, Figure 44 and Figure 45. Some models have up to two power ports. One port is in the fairing. The other port is in the Tour-Pak.

These ports can be used to power or charge 12 VDC accessories with a standard automotive power connector. Follow the manufacturer instructions when installing and operating accessories. Firmly push the accessory connector into the power port.

### **⚠ WARNING**

**Be sure that steering is smooth and free without interference. Interference with steering could result in loss of vehicle control and death or serious injury. (00371a)**

#### *NOTE*

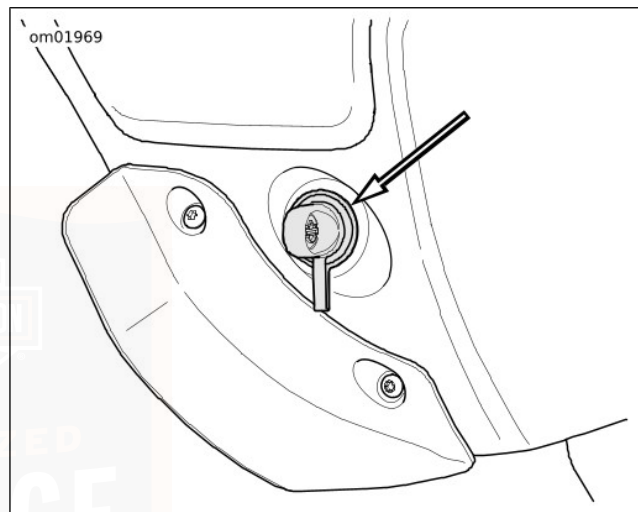
- *Before riding, rotate handlebars to the full right position and check for contact between installed accessories or wiring and the fuel tank.*
- *Do not use the power port as a cigarette lighter. Damage to the socket can occur. See an authorized Harley-Davidson dealer for available accessories.*

The port is energized while the ignition switch is in the IGNITION or ACCESSORY position. Powering accessories for an extended time while the engine is not running drains the battery.

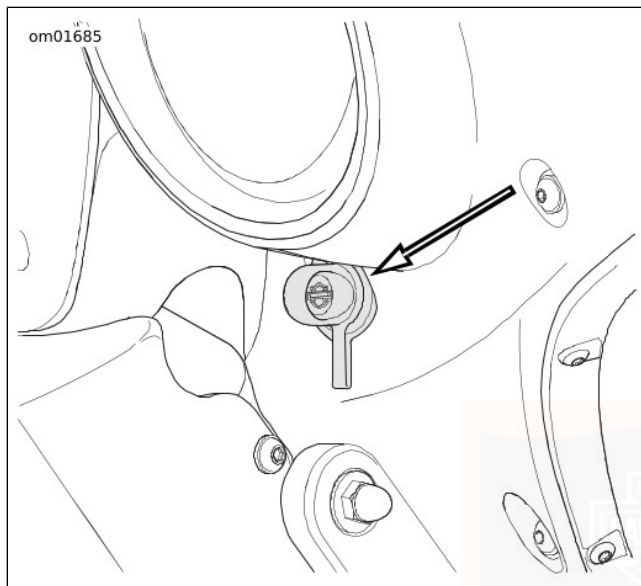
The maximum current draw for all connected accessories is 20 A. This current draw includes the total current for all power ports and any other installed accessories. If excessive current

is detected, the P&A fuse will fail and the accessories will stop operating until the overcurrent situation has been corrected (such as when a faulty or high powered accessory has been removed) and the fuse has been replaced.

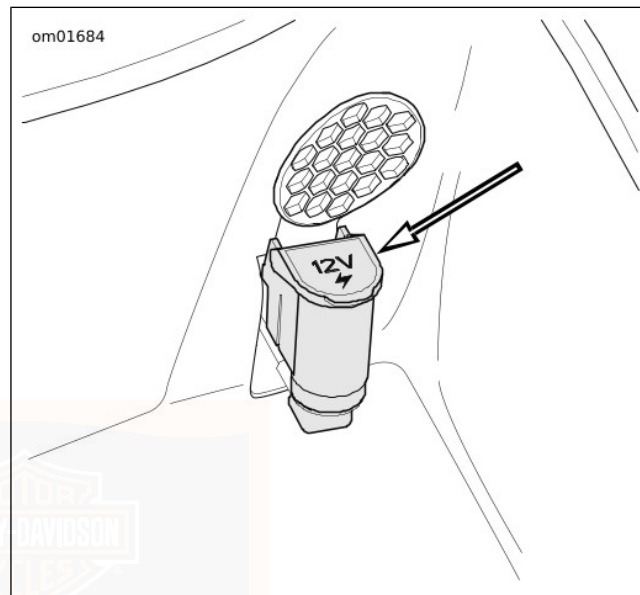
Items charging in the power port may cause interference with radio reception.



**Figure 43. Fairing Power Port: Frame Mounted Fairing**



**Figure 44. Fairing Power Port: Fork Mounted Fairing**



**Figure 45. Tour-Pak Power Port**

## STARTING THE ENGINE

### General

#### NOTICE

**The engine should be allowed to run slowly for 15-30 seconds. This will allow the engine to warm up and let oil reach all surfaces needing lubrication. Failure to comply can result in engine damage. (00563b)**

Rolling the throttle before starting the motorcycle is unnecessary.

### Starting

#### ⚠ WARNING

**Shift transmission to neutral before starting engine to prevent accidental movement, which could result in death or serious injury. (00044a)**

1. Turn ignition switch to IGNITION position. Do not roll the throttle.
2. See Figure 46. With security fob present, set the OFF/RUN switch to RUN.

#### NOTE

*The check engine lamp will light when the ignition is turned on. You will hear the fuel pump run for a short time as it pressurizes the fuel system.*

3. Squeeze the clutch lever in against the hand grip. Shift transmission to neutral.
4. Press the start switch to start the motorcycle.

#### NOTE

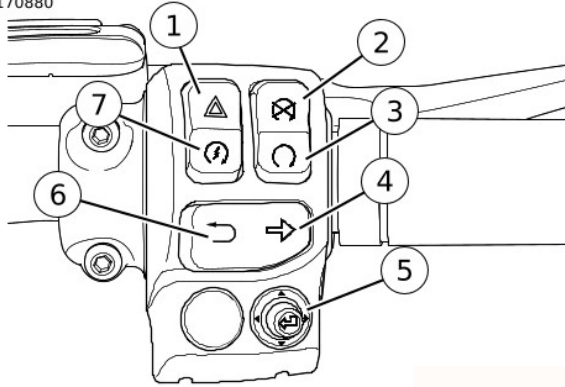
*To allow enhanced lubrication of the engine before start, the engine will crank a number of turns before starting.*

5. When the engine has started, you can operate your motorcycle as you normally would after raising the jiffy stand.

#### NOTE

*The ABS and TCS indicator lamps (models with) will flash until vehicle is moving approximately 5 km/h (3 mph).*

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1. Hazard warning
2. Off
3. Run
4. Right turn signal
5. Cursor/select
6. Back
7. Start

Figure 46. Right Hand Switch Module (Typical)

## STARTING AFTER TIPOVER

### ▲ WARNING

If tip occurs, check all controls for proper operation. Restricted control movement can adversely affect the performance of the brakes, clutch or ability to shift, which could result in loss of vehicle control and death or serious injury. (00350a)

### NOTE

- If the motorcycle is tipped over, the word "TIP" appears in the odometer window and four-way flashers activate.
- The engine cannot start until the tip condition is reset.
- The ignition must be reset to turn four-way flashers off.

1. Set motorcycle upright.
2. Cycle the ignition switch and the OFF/RUN switch to OFF.
3. Wait 10 seconds.
4. Cycle the ignition switch to IGNITION.
5. Cycle the OFF/RUN switch to RUN.
6. Push hazard switch to turn four-way flashers off.

## ENGINE IDLE TEMPERATURE MANAGEMENT SYSTEM (EITMS)

The Engine Idle Temperature Management System (EITMS) can provide limited cooling of the rear cylinder for riders who frequently find themselves in prolonged idle conditions or traffic congestion. Riders can enable or disable EITMS to complement their riding style.

### Operation

- If EITMS is active, releasing the clutch lever to the clutch engagement zone will deactivate EITMS and begin firing the rear cylinder. While the vehicle is stopped, the rider may benefit from twisting the throttle/raising engine speed slightly just before riding away, which will deactivate EITMS and begin firing the rear cylinder immediately regardless of clutch lever position.
- The Milwaukee Eight 107 and 117 engine warm idle speed is 850 RPM. The Milwaukee Eight 114 engine warm idle speed is 950 RPM. The idle speed can vary depending on other factors including electrical load on the vehicle. When EITMS is active on this engine, the idle speed will increase to 950-1000 RPM until EITMS is deactivated.

### Activation

#### NOTE

*EITMS will not operate within the first 30 seconds after starting the engine.*

EITMS will turn off the rear cylinder fuel injector **when all of the following preset parameters are met:**

- Throttle position is at idle
- Motorcycle speed is under 1.2 mph (2 km/h)
- Engine speed is under 1200 RPM
- Engine Temperature (ET) sensor input reading is above preset level
- Ambient Air Temperature (AAT) sensor reading is above preset level (radio equipped models only)

### Deactivation

EITMS will deactivate and the rear cylinder fuel injector will resume operation **if any one of the following conditions occur:**

- Ambient Air Temperature (AAT) sensor reading drops below preset levels (radio equipped models only)
- Engine Temperature (ET) sensor reading drops below preset level

- Throttle position is above idle (rider rolls throttle)
- Motorcycle speed exceeds 1.9 mph (3 km/h)
- Engine speed exceeds 1350 RPM
- The clutch is released with the motorcycle in gear

## Enabling / Disabling EITMS

### NOTE

- *EITMS can be enabled or disabled with the engine running or shut off.*
- *On vehicles equipped with radios, the EITMS activation and enabled / disabled can be viewed in the Information Screen.*

**Enabled:** The EITMS engine cooling feature automatically activates whenever the vehicle comes to a complete stop and is idling during elevated temperature conditions. When the feature is enabled, it may not activate under cool riding conditions.

**Disabled:** The EITMS feature is not active under any conditions.

EITMS can be enabled or disabled by performing the following procedure.

1. Turn ignition switch ON. Push the engine OFF/RUN switch on the right handlebar to the RUN position.

2. Push the throttle to roll-off position and hold.
3. See Figure 22 and Figure 23. After 3 seconds, the cruise control indicator lamp will flash indicating the EITMS status.
  - Flashing green indicates EITMS is enabled.
  - Flashing amber indicates that EITMS is disabled.
4. Repeat the procedure to enable or disable EITMS.

### NOTE

- *A flashing cruise lamp indicates the EITMS setting. A solid (non-flashing) lamp indicates the cruise control setting.*
- *The EITMS setting remains in effect until it is changed by the rider or dealer. There is no need to reconfigure EITMS at each startup.*

## STOPPING THE ENGINE

1. Push the off/run switch to off.
2. Turn ignition switch to off.

### NOTE

*If the engine stalls or stops for any reason, turn the ignition switch off to prevent battery discharge.*

## BRAKE SYSTEM

### Front Brake Lever

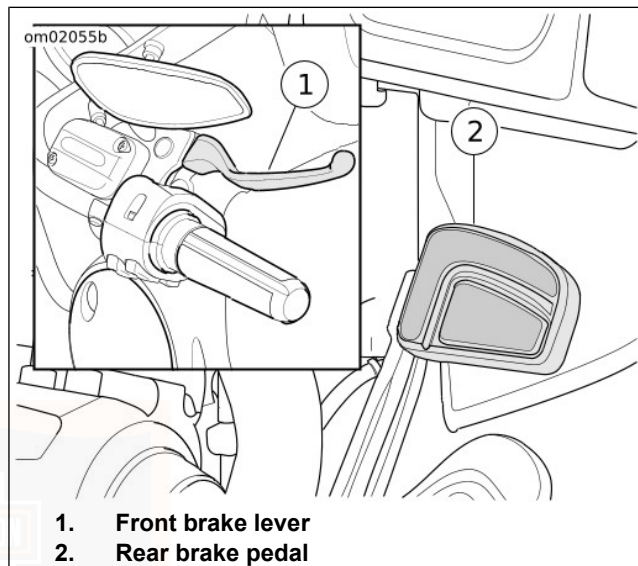
#### **⚠ WARNING**

**Do not position fingers between hand control lever and handlebar grip. Improper hand positioning can impair control lever operation and cause loss of vehicle control, which could result in death or serious injury. (00032a)**

See Figure 47. The front brake hand lever (1) controls the front wheel brake. The lever is on the right handlebar. Operate the hand lever with the fingers of the right hand.

### Rear Brake Pedal

See Figure 47. The rear brake pedal (2) controls the rear wheel brake. The pedal is on the right side. Operate the rear brake pedal with the right foot.



**Figure 47. Brake Controls**

### Non-ABS Brake System

Apply brakes uniformly and evenly to prevent wheels from locking. Use front and rear brakes equally for best results.

## **▲ WARNING**

**Do not apply brake strongly enough to lock the wheel. A locked wheel will skid and can cause loss of vehicle control, which could result in death or serious injury. (00053a)**

### **Reflex Linked Anti-lock Brake System (ABS)**

Harley-Davidson's reflex linked anti-lock brake system assists the rider in maintaining control when braking in an emergency situation. Reflex Linked ABS monitors front and rear brakes to keep the wheels rolling and prevent uncontrolled wheel lock-ups either on dry pavement or on slick surfaces such as gravel, leaves or when riding in wet conditions.

Reflex Linked ABS is more responsive than conventional ABS and allows for more balanced front and rear braking under a wide variety of brake applications.

At speeds greater than 7 km/h (4 mph), the system dynamically adjusts the linking for the amount of brake applied as well as vehicle speed to achieve an optimized brake balance. The system provides more linking when the rider is applying heavier braking and reduces or eliminates linking for light braking and low speeds.

## *NOTE*

*When applying both brakes, the rider may detect slight feedback in the front brake lever or rear brake pedal while the dynamic balancing occurs.*

When linked, applying the front brake lever alone causes the system to also dynamically apply an amount of braking to the rear. Applying the rear brake pedal alone causes the system to also apply an amount of braking to the front. When applying both brakes, the system attempts to dynamically balance braking across both the front and rear wheels.

At speeds less than 3 km/h (2 mph), the brakes are not linked so that low speed maneuverability is not adversely affected, such as when riding the motorcycle in a parking lot.

### **How ABS Works**

The ABS monitors sensors at the front and rear wheels to determine wheel speed. If the system detects one or more wheels are slowing down too quickly, which indicates they are close to locking, or if the deceleration rate does not match a criteria stored in memory, the ABS reacts. The system rapidly opens and closes valves to modulate the brake pressure. During ABS activation, the system provides the electronic equivalent of manually pumping the brakes. The system can cycle many times per second.

The rider recognizes ABS activation by the slight pulsing sensation in the hand lever or the rear brake pedal. A clicking sound from the ABS module can also be heard. Both are the result of normal operation. Refer to Table 35.

For additional ABS information visit [www.harley-davidson.com](http://www.harley-davidson.com).

## How To Use ABS

While an advantage in emergency braking, ABS is not a substitute for safe riding. The safest way to stop a motorcycle is using both brakes.

Harley-Davidson ABS is a manual assist system. During an emergency stopping situation, maintain pressure on the brakes through all ABS events. Do not modulate or "pump" the brake controls. The wheels do not lock until the end of the stop when motorcycle speed slows to a rate at which ABS is no longer needed.

## ABS: Tires and Wheels

Motorcycles equipped with ABS must always use Harley-Davidson tires and wheels. The ABS monitors the rotational speed of the wheels through individual wheel speed sensors. Changing to different diameter wheels or different size tires can alter the rotational speed. Different-sized wheels and tires can upset the calibration of the ABS and have an adverse effect on its ability to detect and prevent uncontrolled wheel lockups. Operating at tire pressures other than those pressures specified can reduce ABS braking performance. Refer to OWNER MANUAL > SPECIFICATIONS (Page 29).

## Cornering Rider Safety Enhancements

For vehicles equipped with Cornering Rider Safety Enhancements see OPERATION > CORNERING RIDER SAFETY ENHANCEMENTS (Page 129).

**Table 35. ABS Symptoms and Conditions**

SYMPTOM	CONDITION
ABS lamp continuously lit	ABS fault detected. See a Harley-Davidson dealer for service.
ABS lamp slow flashing	This indicates a normal self-diagnostics process when the motorcycle is first turned on and the speed is under 5 km/h (3 mph). ABS is not operational until the lamp turns off. If the lamp continues flashing at speeds greater than 5 km/h (3 mph), see a Harley-Davidson dealer for service.

**Table 35. ABS Symptoms and Conditions**

<b>SYMPTOM</b>	<b>CONDITION</b>
ABS lamp rapid flashing and solid security/fault indicator lamp	This indicates a potential brake system fault. Apply both front and rear brakes to reduce speed and to stop motorcycle. The brake controls could feel stiff when applied. If this occurs, move the motorcycle to a safe location to stop. Service is required to correct the fault before continuing to ride. See a Harley-Davidson dealer for service.
Pulsing brake lever or pedal during an ABS event	Normal condition.
Clicking sound during an ABS event	Normal condition.
"Surge" sensation while braking	Normal condition. This is most noticeable when braking with one brake (front only or rear only). Result of a reduction in deceleration which can be caused by cracks or bumps in road, engine braking (high engine RPMs causing the rear wheel to slow down), hard braking at slow speeds, and other conditions. This is due to ABS modulating caliper brake pressure to prevent uncontrolled wheel lock.
Temporarily stiff rear brake pedal	Normal condition. Engine braking (high engine RPMs causing the rear wheel to slow down) or down shifting can activate ABS. If applying the rear brake at the same time or immediately after, the ABS may be closing a valve to prevent pressure to the rear brake. This is due to ABS modulating caliper brake pressure to prevent uncontrolled wheel lock.
Tire chirp	Normal condition. Depending on surface, tire can chirp without locking the wheel.
Black mark on pavement	Normal condition. Depending on surface, tire can leave a black mark without locking the wheel.
Wheel lock at low speed	Normal condition. ABS does not activate on front wheel below 5 km/h (3 mph) or on rear wheel below 8 km/h (5 mph).

## CORNERING RIDER SAFETY ENHANCEMENTS

### Cornering Enhanced ABS (C-ABS) Functions

The Cornering Enhanced Antilock Braking System (C-ABS) is a variant of ABS that takes into consideration the lean angle of the motorcycle. While cornering, the available grip for braking is reduced and C-ABS automatically compensates for this reality.

Models equipped with C-ABS have a traction control button and a traction control icon that lights when power is turned on, see OPERATION > LEFT HAND CONTROL SWITCHES (Page 92) and OPERATION > INSTRUMENTS (Page 82).

For additional C-ABS information visit [www.harley-davidson.com](http://www.harley-davidson.com).

### Cornering Enhanced Electronic Linked Braking (C-ELB)

The C-ELB system provides balanced front and rear braking under a wide variety of brake applications. The system provides more linking when the rider is applying heavier braking and reduces or eliminates linking for light braking and low speeds. When linked, applying the front brake lever alone will cause the system to also dynamically apply an amount of braking to the rear. C-ELB takes into account the motorcycle lean angle and will alter the proportioning of brake pressure

between the front and rear brakes while cornering in an attempt to improve the ability of the bike to maintain the rider's intended path.

### Vehicle Hold Control (VHC)

Vehicle Hold Control (VHC) uses brake pressure to keep the motorcycle from rolling downhill when it is stopped on an incline, making it easier to ride away when starting on an incline, such as a hill, a bridge or a parking ramp. The VHC holds brake pressure when activated and prevents the motorcycle from moving after the rider has released the brake controls. The system holds brake pressure until the rider actuates the throttle and clutch to pull away.

#### NOTE

*VHC is not intended to be used as a parking brake.*

**Activation:** The rider activates VHC by applying extra pressure to either the front brake hand lever or the rear brake foot control after the motorcycle has come to a complete stop. If rider brakes very hard to a stop, and holds the brake pressure after stopped, VHC may also set without any added squeeze. A VHC indicator light will illuminate to confirm that the rider has activated VHC and the ABS system will hold brake pressure after the rider releases the brake control.

**Deactivation:** VHC is deactivated automatically as the rider begins to pull away from a stop, or if the rider firmly applies

and releases either brake control. VHC may deactivate if rider aggressively revs the engine with clutch lever pulled in. VHC will also deactivate if the rider lowers the side stand on models with a side stand sensor (not in all markets) or shifts into neutral on models without a side stand sensor. VHC will deactivate when engine stops running. VHC will deactivate after between approximately 3 minutes and 5 minutes. In most situations, the indicator light will flash and the VHC will release if there is no rider action. (VHC may deactivate in less than five minutes to prevent overheating if being used often on steep grades.)

## **Tire Pressure Monitoring System (TPMS)**

TPMS alerts the rider to low tire air pressure. Maintaining proper tire air pressure is important both for safety and for tire life. The TPMS displays current front and rear tire pressure on the Instrument Module (IM) and displays an indicator to alert the rider when tire pressure is low, and the pressure should be checked.

## **C-ABS: Tires and Wheels**

Motorcycles equipped with C-ABS must always use Harley-Davidson tires and wheels. The C-ABS monitors the rotational speed of the wheels through individual wheel speed sensors. Changing to different diameter wheels or different size tires can alter the rotational speed. Different-sized wheels and tires can upset the calibration of the C-ABS and have an

adverse effect on its ability to detect and prevent uncontrolled wheel lockups. Operating at tire pressures other than those pressures specified can reduce C-ABS braking performance. Refer to OWNER MANUAL > SPECIFICATIONS (Page 29).

## **TRACTION CONTROL**

### **Traction Control System**

While an advantage in certain situations, traction control is not a substitute for safe riding.

Harley-Davidson's cornering traction control system can detect when the drive wheel loses traction. In wet or slippery conditions, or under abrupt acceleration, the traction-control system will limit torque or apply brakes to the drive wheel during loss of traction.

By reducing tire spin, the Traction Control System will maintain control, while allowing maximum acceleration.

The vehicle is also equipped with a Drag Torque Slip Control System to help maintain control under deceleration. When you deliver an abrupt reduction in acceleration to the vehicle, during early downshifts, or when the powertrain decelerates on wet or slippery surfaces, the vehicle may experience rear wheel slip.

## Ride Modes

**Rain mode:** Used for surfaces with reduced traction like wet roads or gravel.

**Road mode:** Used for optimum riding conditions like dry paved roads.

## How Traction Control Works

The cornering enhanced traction control system constantly monitors the vehicles lateral acceleration when going straight and during turns, and will adjust torque to the drive wheel when it senses a loss of traction.

This adjustment is designed to limit wheel spin and help the rider maintain the desired course of travel in corners.

During start up, the traction-control lamp flashes simultaneously with the ABS lamp, this indicates that both systems are waiting for the vehicle to complete a wheel speed sensor check. The traction control system is operational after startup even during the wheel speed sensor check. The traction control lamp should turn off when the sensor check is complete.

If the drag torque slip control system senses rear wheel slip under powertrain deceleration, it may decrease drag torque, by increasing engine Revolutions Per Minute (RPM), to limit the slip and maintain control.

## How To Use Traction Control

### NOTE

*When running a vehicle on a dyno it is advised that traction control be disabled to prevent intervention based on tire speed differences front to rear.*

Traction control is automatically enabled at each ignition start cycle. The rider may choose to disable traction control anytime the vehicle is at a complete stop and the engine is running by pressing and holding the traction control switch for one full second.

The rider may find it beneficial to disengage traction control in low speed low traction situations such as, riding in deep sand, riding uphill on wet grass, or similar situations. The traction control lamp will illuminate and remain illuminated to indicate traction control is disabled. However, if the TC lamp remains on in conjunction with the fault indicator lamp, it means the traction control system has faulted, if this occurs see an authorized Harley-Davidson dealer.

During some fault conditions Traction Control will be enabled with degraded function and cannot be disabled.

The rider may again enable traction control at any time during vehicle operation by pressing and releasing the Traction control switch.

If the traction control lamp begins fast-blinking while riding, it means the traction-control system is intervening.

Intervention of the Drag Torque Slip Control is indicated by fast-blinking of the traction control lamp. However, disabling your Traction Control will not disable Drag Torque Slip Control.

**Table 36. Traction Control Symptoms and Conditions**

SYMPTOM	CONDITION
Traction control lamp off	Traction control system active.
Traction control lamp continuously lit	Traction control system deactivated by user.
Traction control lamp and security/fault indicator lamp continuously lit	Traction control system faulted.
Traction control lamp flashing	Normal condition. Traction control intervention.
Reduction of throttle response during a traction control event	Normal condition. Traction control intervention.
"Surge" sensation while decelerating	Normal condition. Drag torque slip control intervention.

## SHIFTING GEARS

### NOTICE

The clutch must be fully disengaged before attempting a gear shift. Failure to fully disengage the clutch can result in equipment damage. (00182a)

### Stopped, Engine Off

Slowly pull clutch hand lever in against handlebar grip to fully disengage clutch. Gears do not engage because the transmission shafts are not turning and shifter components

are not lined up. **This condition is commonly referred to as shift rejection caused by gear abutment.** Rock the motorcycle backward and forward while lightly pressing the shift lever.

### Starting from a Stop

#### NOTE

*Always start the engine with the transmission in neutral. Always start forward motion in first gear.*

*Shift rejection or gear abutment can also happen when the vehicle is running and the transmission shafts stop rotating. More common when the clutch lever is held in for*

long periods of time before attempting to shift into first gear. Gear lube temperatures can also influence the frequency of this condition. Occurring more often when temperatures are cold and lubrication is more resistant to motion. If this condition occurs while the engine is running and the vehicle is stopped, make sure you are in neutral, then release the clutch lever to start the shafts spinning. Pull the clutch lever back in and immediately attempt to shift into first gear.

1. With the engine running and the jiffy stand retracted, pull the clutch hand lever against the handlebar grip to disengage the clutch.
2. Press the gear shift lever down to the end of its travel and release. The transmission is now in first gear.
3. Ease out the clutch lever and at the same time, gradually open the throttle.

## Upshift (Acceleration)

See Figure 48. Engage the next higher gear when the motorcycle reaches the shifting speed. Refer to Table 37.

**Table 37. Recommended Upshift Speeds**

GEAR CHANGE	mph	km/h
First to second	15	25
Second to third	25	40
Third to fourth	35	55

**Table 37. Recommended Upshift Speeds**

GEAR CHANGE	mph	km/h
Fourth to fifth	45	70
Fifth to sixth	55	85

1. Close the throttle.
2. Slowly pull clutch hand lever in against handlebar grip to fully disengage clutch.
3. Lift the gear shift lever up to the end of its travel and release.
4. Ease out the clutch lever and gradually open the throttle.
5. Repeat the previous steps to engage remaining gears.

### NOTE

- Disengage the clutch completely before each gear change.
- Partially open the throttle so the engine does not drag when the clutch lever is released.

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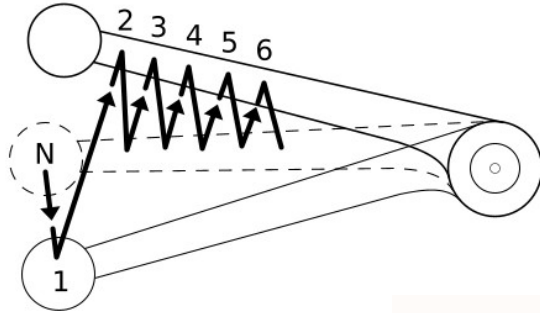


Figure 48. Shifting Sequence: Upshift

## Downshift (Deceleration)

### ▲ WARNING

Do not downshift at speeds higher than those listed. Shifting to lower gears when speed is too high can cause the rear wheel to lose traction and lead to loss of vehicle control, which could result in death or serious injury. (00045b)

See Figure 49. When speed decreases, as when climbing a hill or slowing for a turn, shift to the next lower gear. Refer to Table 38.

Table 38. Recommended Downshift Speeds

GEAR CHANGE	mph	km/h
Sixth to fifth	50	80
Fifth to fourth	40	65
Fourth to third	30	50
Third to second	20	30
Second to first	10	15

### NOTE

The shifting points shown in the table are recommendations. Individual shifting points can differ from the table.

1. Close the throttle.
2. Slowly pull clutch hand lever in against handlebar grip to fully disengage clutch.
3. Press the gear shift lever down to the end of its travel and release.
4. Ease out the clutch lever and gradually open the throttle.
5. Repeat the previous steps to engage remaining gears.

### NOTE

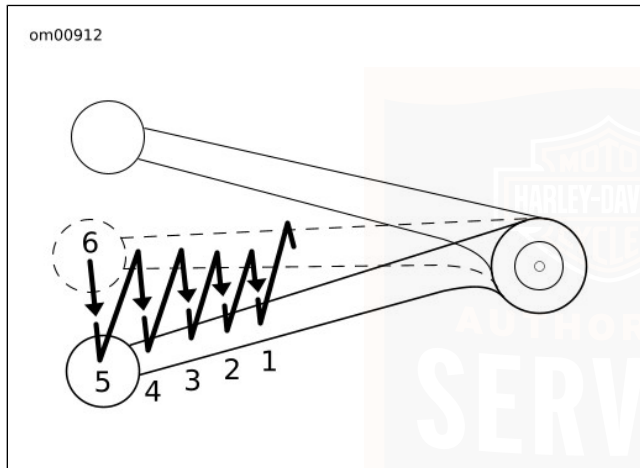
- Disengage the clutch completely before each gear change.

- Partially open the throttle so the engine does not drag when clutch lever is released.

### NOTICE

**Shift to neutral before stopping engine. Shifting mechanism can be damaged by shifting gears while engine is stopped. (00183a)**

The gear shifter mechanism permits shifting the transmission to neutral from either first or second gear.



**Figure 49. Shifting Sequence: Downshift**

## PASSENGER FOOTBOARDS/FOOTRESTS

If equipped, the passenger footboards and footrests are adjustable up or down to one of three positions. The passenger footrests only can be angled for passenger comfort.

### Height Adjustment

See Figure 50 and Figure 51.

#### NOTE

- Remove plastic plugs from holes in the frame footboard mount (3) as necessary.
- If the bracket (4) does not slide up or down, loosen but do not remove the lower shoulder bolt (5).

1. Remove screw (1) and lockwasher (2) from top of bracket.
2. Slide the bracket to the desired position.
3. Install the screw and lockwasher. Tighten to  
Torque: 49–56 N·m (36–41 ft-lbs) *Passenger footboard/footrest screw*
4. If loosened, tighten the lower shoulder bolt. Tighten to  
Torque: 5.4–8.1 N·m (48–72 in-lbs) *Passenger footboard lower shoulder bolt.*

## Footrest Angle Adjustment

1. See Figure 51. Remove the end screw (6).
2. Rotate as desired.
3. Apply **LOCTITE 243 MEDIUM STRENGTH THREADLOCKER AND SEALANT** (blue) to threads of screw.
4. Install the screw and tighten.

Torque: 20.3–27.1 N·m (15–20 ft-lbs) *Passenger footboard end screw*

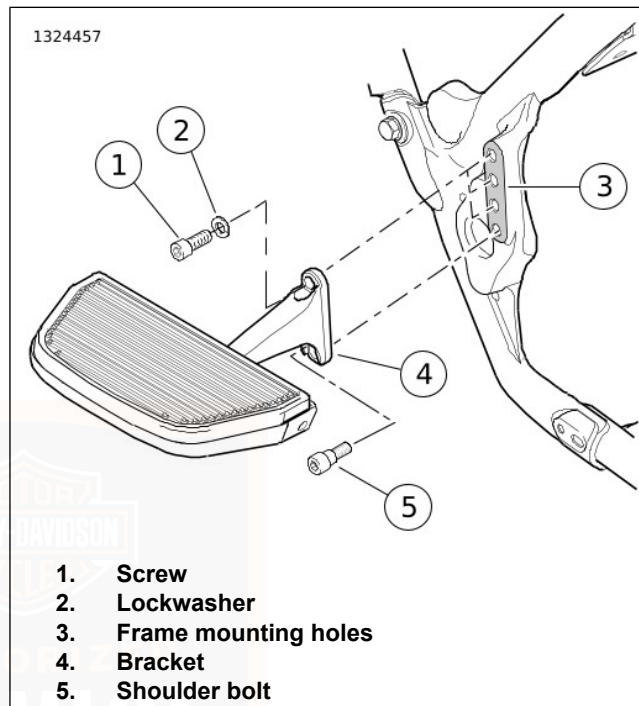
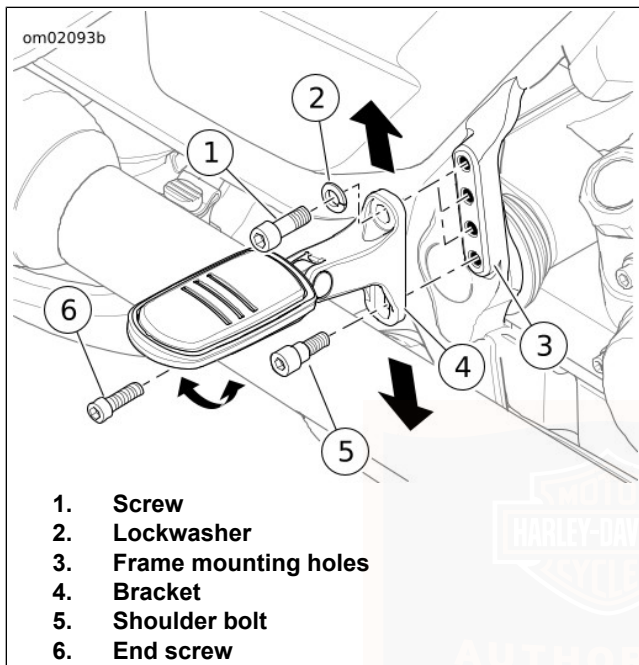


Figure 50. Passenger Footboard



**Figure 51. Passenger Footrest (typical)**

## WINDSHIELD

Models without fairings may feature a removable windshield. The windshield can be removed or installed before riding.

### NOTE

*Windshields require special care. Do not use ammonia-based or gas station window cleaners. These cleaners can damage the windshield. For proper windshield maintenance, see AFTER RIDING > WINDSHIELD CARE (Page 156).*

### Removal

1. See Figure 52. Lift the wire form latch springs on both sides of the windshield bracket.
2. Push the top of the windshield forward to disengage from the top grommets.
3. Lift the windshield up to disengage from the bottom grommets.

### Installation

1. See Figure 52. Firmly seat the bottom of the windshield bracket to engage the lower grommets.
2. Lift the wire form latch springs on both sides of the windshield bracket.
3. Push the top of the windshield rearward to engage the top grommets.
4. Release the wire form latch springs. Check that all four bracket notches are seated in the grommets and the windshield is secure on the motorcycle.

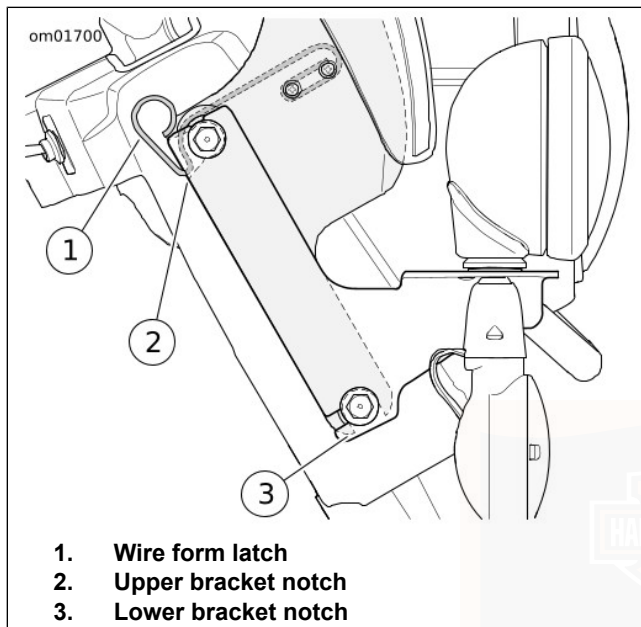


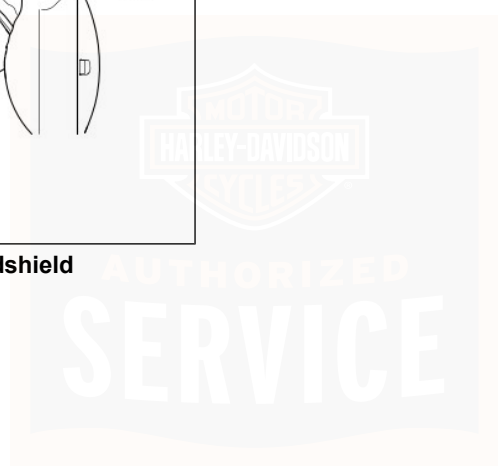
Figure 52. Removeable Windshield

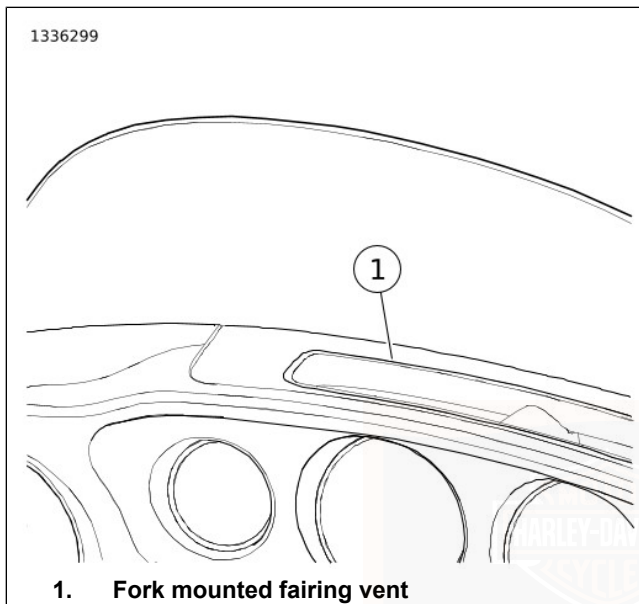
## FAIRING VENTS

### Fork Mounted Fairing

See Figure 53. Fork mounted fairings have a vent in the upper dash for ventilation. The vent provides a comfortable flow of air to the rider and to minimize wind buffeting.

Keep the vent free of foreign objects. Periodically clean the vent to remove dirt, bugs and leaves. See AFTER RIDING > FAIRING SPLITSTREAM VENT CARE (Page 159).





**Figure 53. Fairing Splitstream Vent (Fork Mounted Fairing)**

### **Frame Mounted Fairing**

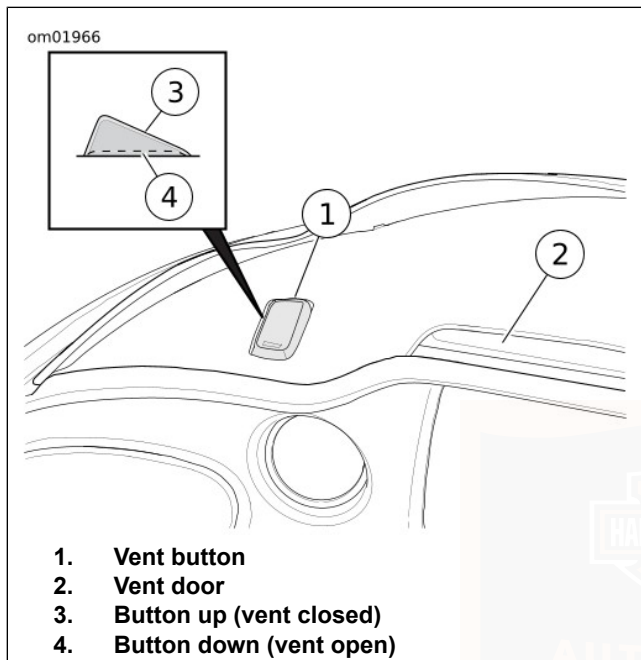
Frame mounted fairings have a vent in the upper dash. This vent can be closed or opened to provide a comfortable flow of air to the rider and to reduce wind buffeting. The preferred position is to keep the vent open for improved turbulence.

**Open:** See Figure 54. Press down the vent button until it clicks. The vent door remains in the open position.

**Close:** Press down the vent button and release. The button pops up and the vent door closes.

**Reset:** If the latch does not catch, firmly press the button to open, close and reopen the vent until the mechanism engages.

Keep the vent free of foreign objects. Periodically clean the vent mechanism to remove dirt, bugs and leaves, and to keep all parts from sticking. Clean the button and vent door if they become difficult to open or close. See AFTER RIDING > FAIRING SPLITSTREAM VENT CARE (Page 159).



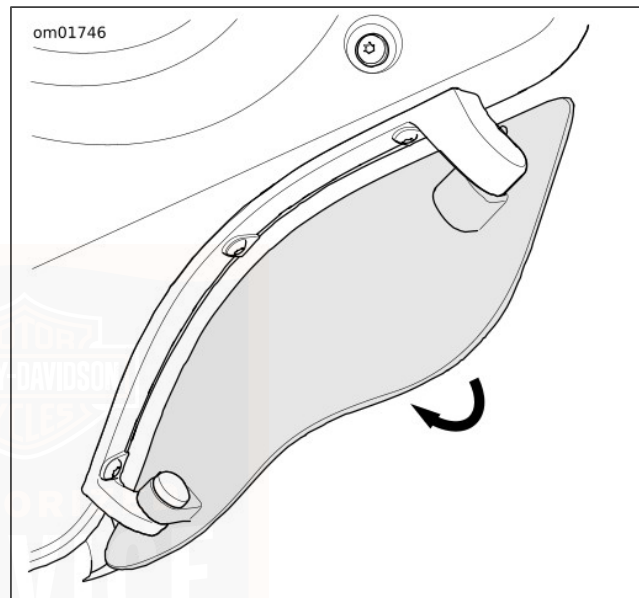
**Figure 54. Fairing Splitstream Vent (Frame Mounted Fairing)**

## ADJUSTABLE AIR DEFLECTORS

See Figure 55. Some models have adjustable air deflectors located along the left and right edge of the fairing. These

deflectors can be rotated to direct airflow for rider and passenger comfort.

**Adjust:** With the vehicle parked, grasp the outer edge of the deflector and pivot to the desired position.



**Figure 55. Air Deflector**

## FAIRING LOWERS

Some models have fairing lowers. The fairing lowers provide an extra level of riding comfort by blocking wind and water from the rider's legs.

### NOTE

*The fairing lowers on Twin-Cooled models contain cooling system components and do not have a storage compartment.*

*Do not remove fairing lowers on Twin-Cooled vehicles.*

*Do not store any items in the fairing lowers on a Twin-Cooled vehicle.*

## Vent Door

See Figure 56. The fairing lower vent door can be adjusted to direct airflow for rider comfort and circulate air across the engine. Slide the vent door lever to adjust or close the vent door.

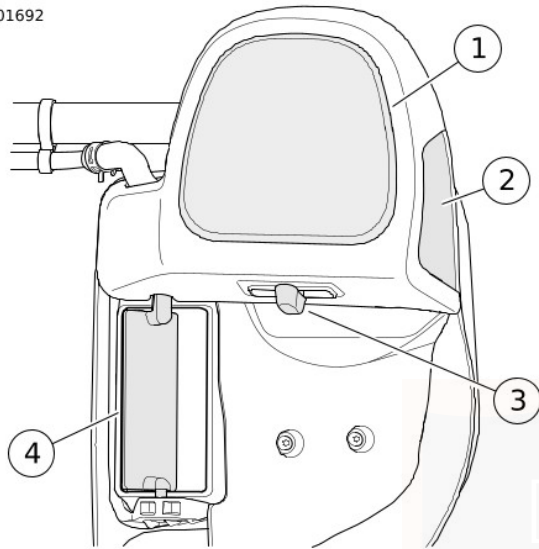
## Cooling System: Twin-Cooled Vehicles

See Figure 56. On Twin-Cooled vehicles, the fairing lowers include cooling system components. The coolant bottle is behind the access panel in the right side fairing lower. See MAINTENANCE AND LUBRICATION > COOLING SYSTEM (Page 177) to check the coolant level.

The access panel is secured with three retainers. Carefully pry at the top and at each lower corner to remove the access panel. To install, push the panel until the retainers snap into place.

Keep the radiator screen and outlet duct clean and free from obstructions.

om01692



1. Access panel
2. Outlet duct
3. Vent door lever
4. Vent door

**Figure 56. Fairing Lower: Twin-Cooled Models**

## SADDLEBAGS

### ⚠ WARNING

Do not exceed saddlebag weight capacity. Put equal weight in each bag. Too much weight in saddlebags can cause loss of control, which could result in death or serious injury. (00383a)

### ⚠ WARNING

Do not operate motorcycle without saddlebags attached because they contain side and/or rear reflectors. Motorcycle operation without reflectors can violate local regulations and lead to decreased visibility of the motorcycle to other motorists, which could result in death or serious injury. (12904a)

### NOTE

Maximum saddlebag weight capacity is 9.1 kg (20 lb) in each saddlebag.

## Opening

1. See Figure 57. Unlock saddlebag lock with the key.
2. Lift the saddlebag lever.
3. Lift the lid from the inner side of the saddlebag.

## Closing

1. See Figure 57. Close the saddlebag lid.
2. Push the lever down to engage the latches. Check that the lid is secure.
3. Lock the saddlebag.

## Removing

1. See Figure 57. Open the saddlebag.
2. See Figure 58. Turn the mounting screw levers counterclockwise to remove the mounting screws from the support bracket.
3. Lift the saddlebag from the saddlebag rail.

### NOTE

- *Do not drag or scrape saddlebags on the ground.*
- *Saddlebags with a curved bottom will not rest upright on the ground. Set saddlebags on a level surface to prevent tipping.*

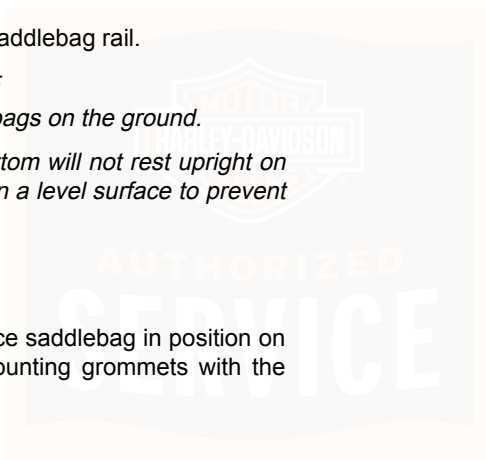
## Installing

1. See Figure 58. Carefully place saddlebag in position on saddlebag rail. Align the mounting grommets with the support bracket.

### NOTE

*The rear mounting screw lever will interfere with the saddlebag cover unless positioned with lever pointed downward.*

2. Install the mounting screws through the grommet into support bracket. Turning the lever clockwise, tighten the mounting screws so the levers are pointed downward between the 3 o'clock and 9 o'clock positions as shown.
3. Check that the saddlebag is secure on the motorcycle.
4. Close and lock the saddlebag.



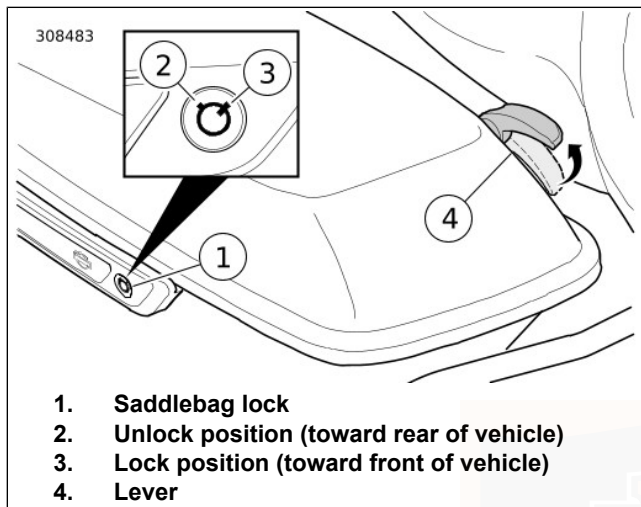


Figure 57. Saddlebag

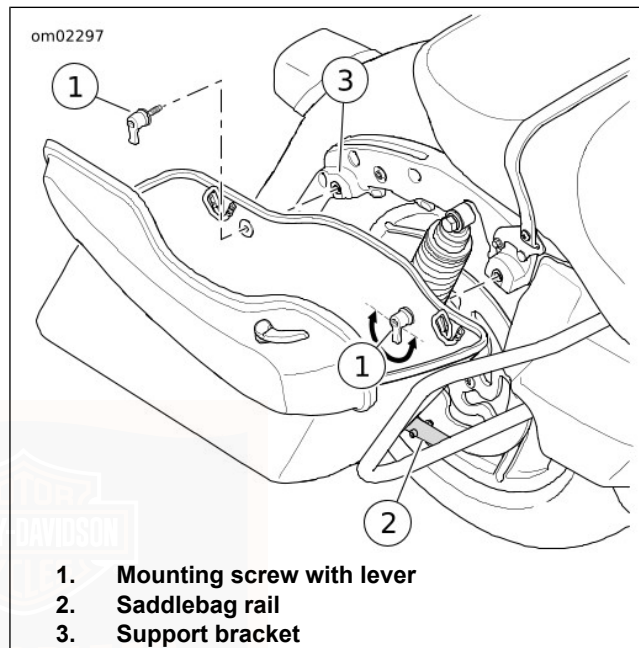


Figure 58. Saddlebag Removal/Installation (typical)

## TOUR-PAK

### ⚠ WARNING

Do not exceed Tour-Pak weight capacity. Too much weight can cause loss of control, which could result in death or serious injury. (00401c)

### ⚠ CAUTION

Do NOT pull on any electrical wires. Pulling on electrical wires may damage the internal conductor causing high resistance, which may result in minor or moderate injury. (00168a)

#### NOTE

Maximum luggage rack weight capacity is 4.5 kg (10 lb). Combined load of luggage rack and Tour-Pak must not exceed 13.6 kg (30 lb).

See Figure 59. Some vehicles have a lockable Tour-Pak for storing cargo.

**Lock/Unlock:** Use the ignition key to lock or unlock the latch handle.

**Open:** Pull the latch handle. Raise the lid.

**Close:** Close the lid. Push the latch handle to secure the lid. Lift on lid to check that it is secure.

Some vehicles have a luggage rack. Tie down and secure cargo on the luggage rack before riding.

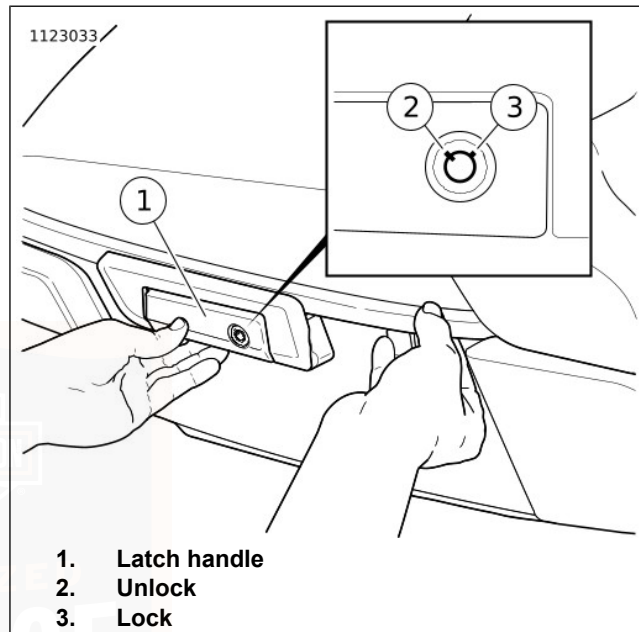


Figure 59. Tour-Pak

## Adjustment

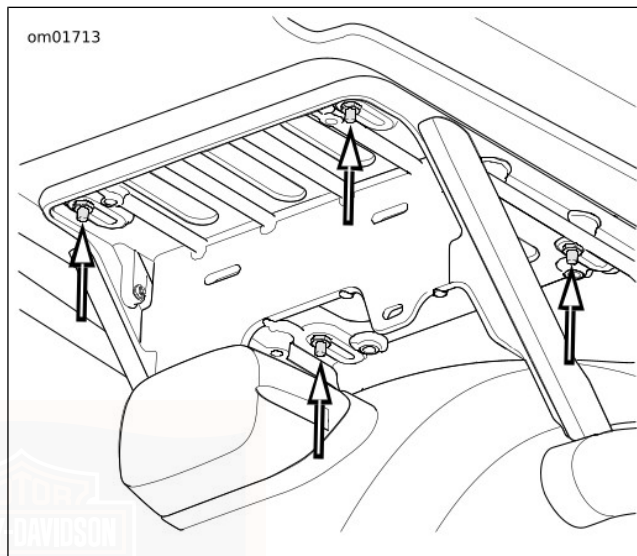
The position of the Tour-Pak can be adjusted forward or rearward for passenger comfort.

### NOTE

*The Tour-Pak position cannot be adjusted on Asia Pacific (APC) configuration motorcycles, except to access the seat screw. To determine vehicle configuration, check the VIN identifier in Table 7. See SEAT ACCESS (APC MODELS) to move the Tour-Pak on APC configuration vehicles.*

1. See Figure 60. Loosen the four nuts securing the Tour-Pak to the support.
2. Slide the Tour-Pak to the desired position.
3. Tighten the four nuts.

Torque: 6.8–8.1 N·m (5.0–6.0 ft-lbs) *Tour-Pak mounting nuts*



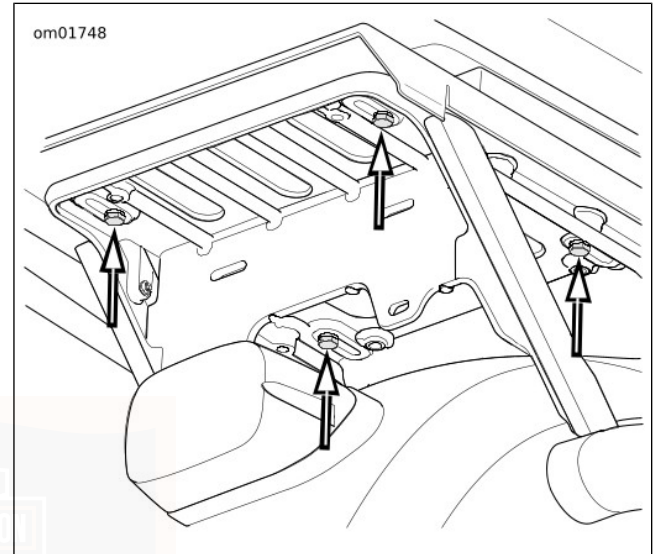
**Figure 60. Tour-Pak Position Adjustment**

### Seat Access: APC Models

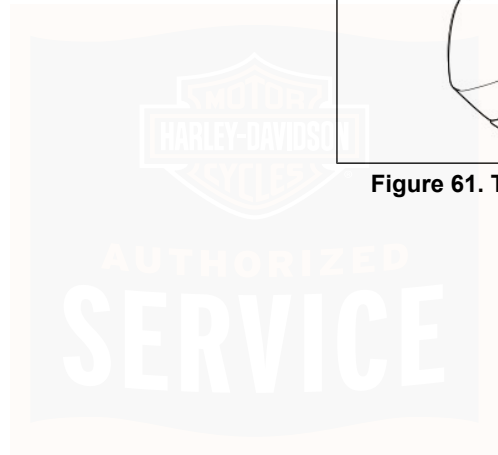
On APC vehicles, the Tour-Pak can be moved rearward to access the seat screw. Refer to the vehicle configuration for the motorcycle in Table 7. The Tour-Pak must be installed in its original position before riding.

1. See Figure 61. Remove the four screws securing the Tour-Pak bracket to the support.
2. Pull the Tour-Pak rearward to access the seat screw.
3. When finished, move the Tour-Pak to its original position. Align all four holes in the bracket with the slots in the support.
4. Install the four screws. Tighten.

Torque: 6.8–8.1 N·m (5.0–6.0 ft-lbs) *Tour-Pak bracket screws (APC models)*



**Figure 61. Tour-Pak Bracket Screws (APC Models)**



## LUGGAGE

### ⚠ WARNING

See **ACCESSORIES AND CARGO** section within the **SAFETY FIRST** section in your owner's manual. Improper cargo loading or accessory installation can cause component failure and adversely affect stability, handling and performance, which could result in death or serious injury. (00021c)

### ⚠ WARNING

Do not exceed the motorcycle's **Gross Vehicle Weight Rating (GVWR)** or **Gross Axle Weight Rating (GAWR)**. Exceeding these weight ratings can lead to component failure and adversely affect stability, handling and performance, which could result in death or serious injury. (00016f)

- GVWR is the total weight of the motorcycle, accessories, rider, passenger and cargo that can be safely carried.

- GAWR is the maximum amount of weight that can be safely carried on each axle.
- See information label on frame steering head or frame downtube for GVWR and GAWR.

### ⚠ WARNING

**Improper loading of cargo or installation of accessories can affect motorcycle stability and handling, which could result in death or serious injury. (00095a)**

- Keep cargo weight concentrated close to the motorcycle and as low as possible to minimize the change in the motorcycle's center of gravity. Distribute weight evenly on both sides of the vehicle. Do not load bulky items too far behind the rider or add weight to the handlebars or front forks. Do not exceed maximum load on the label within the luggage.
- Check that cargo is secure. The cargo cannot shift while riding. Periodically recheck load.
- Close and lock luggage before riding or leaving the vehicle unattended.

## GENUINE MOTOR PARTS AND ACCESSORIES

Stop at your Harley-Davidson dealer to pick up a copy of the Genuine Motor Parts and Accessories catalog or go to [www.harley-davidson.com](http://www.harley-davidson.com) to view thousands of Genuine Motor Accessories that are available for Harley-Davidson motorcycles.

The website includes the following tools and resources for accessorizing and personalizing your motorcycle.

### Online Catalog

The full Genuine Motor Parts and Accessories catalog is available online in Portable Document Format (PDF) format. The catalog includes hundreds of pages of Harley-Davidson accessories and maintenance products.

### Shop for Your Bike

Browse through categories of accessories and options available specifically for your motorcycle. View product descriptions, pricing, fitment and online instruction sheets for many of the available products.

## CLEANING AND GENERAL CARE

- Harley-Davidson cleaning products are tested extensively for use on motorcycle surfaces. These products are formulated to be compatible with one another. See a Harley-Davidson dealer to purchase recommended cleaning products. Refer to Table 39 and Table 40.
- Care, cleaning and protection of the vehicle surfaces is the responsibility of the owner.
- Clean and protect the cosmetic surfaces on your motorcycle as often as possible to inhibit rust and corrosion.
- Some painted finishes and other surfaces may be scratched if gravel, dirt or grime are rubbed across the surface during washing. Use clean towels and avoid rubbing sediment across gloss finishes.
- Do not use paper towels, cloth diapers or other materials with nylon fibers which can cause fine scratches to surfaces.
- For repair of scratched surfaces, see a Harley-Davidson dealer.

### **▲ WARNING**

**Observe warnings on labels of cleaning compounds. Failure to follow warnings could result in death or serious injury. (00076a)**

### **▲ WARNING**

**Do not wash brake discs with cleaners containing chlorine or silicone. Cleaners containing chlorine and silicone can impair brake function, which could result in death or serious injury. (00077a)**

### **NOTICE**

**Do not use a pressure washer to clean motorcycle. Using a pressure washer can result in equipment damage. (00489c)**

### **NOTICE**

**Use of abrasive products or powered buffing equipment will cause permanent cosmetic damage to body panels. Use only recommended products and techniques outlined in this manual to avoid damaging body panels. (00245b)**

## **Cleaning Wheels and Tires**

### *NOTE*

*Corrosion to wheels is not considered to be a defect in materials or workmanship.*

- Wheels can corrode or be cosmetically damaged if they are not properly cleaned, polished and preserved.
- Harley-Davidson recommends that wheels be cared for weekly.
- Keep wheels clean from harsh chemicals, acid-based wheel cleaners, salt, and accumulated brake dust.
- After washing wheels with WHEEL & TIRE CLEANER, use the polish and sealing products according to the type of wheels on your motorcycle. Refer to Table 39.

## **Radiator**

See MAINTENANCE AND LUBRICATION > COOLING SYSTEM (Page 177) for important information regarding the cleaning of the radiator.

## **RECOMMENDED CLEANING PRODUCTS**

The following products are recommended for Harley-Davidson motorcycles, parts and accessories. Your motorcycle may not have all the components shown in the tables.

**Table 39. Recommended Cleaning and Care Products**

<b>PRODUCT PART NO.</b>	<b>PURPOSE</b>	<b>FRAME</b>	<b>BODY PANELS</b>	<b>WHEELS</b>	<b>DENIM FINISH</b>	<b>OTHER</b>
BARE METAL POLISH 93600028 (U.S.) 93600083 (Non-U.S.)	Polishes non-clear coated polished aluminum or polished stainless steel surfaces. <sup>(1)</sup>	As applicable				
BLACK LEATHER REJUVENATOR 93600033 (U.S.) 93600081 (Non-U.S.)	Rejuvenates black leather products so they look brand new.	No	No	No	No	Black leather goods
BUG REMOVER 93600122 (U.S.) 93600140 (Non-U.S.)	Removes bugs from metal, plastic or painted surfaces.	Yes	Yes	Yes	Yes	
CHROME CLEAN & SHINE 93600031 (U.S.) 93600082 (Non-U.S.)	Shines chrome-plated surfaces and cleans brushed aluminum or stainless steel surfaces.	As applicable				
DENIM PAINT CLEANER 93600124 (U.S.) 93600127 (Non-U.S.)	Waterless quick cleaner and detailer.	Yes	Yes	Yes	Yes	
ENGINE BRIGHTENER 93600002 (U.S.) 93600068 (Non-U.S.)	Rejuvenates wrinkle black engine finish.	No	No	No	No	Wrinkle black engines
EVERYDAY DETAILER 93600157 (U.S.) 93600158 (Non-U.S.)	Cleans, shines, brightens and protects in a short amount of time.	Yes	Yes	Yes	No	

**Table 39. Recommended Cleaning and Care Products**

<b>PRODUCT PART NO.</b>	<b>PURPOSE</b>	<b>FRAME</b>	<b>BODY PANELS</b>	<b>WHEELS</b>	<b>DENIM FINISH</b>	<b>OTHER</b>
GRAPHENE SPRAY COATING 93600166 (U.S.) 93600169 (Non-U.S.)	Provides a protective barrier for glossy paint surfaces and chrome. Repels water and dust.	Yes	Yes	As applicable	No	
GLOSS DETAILER 93600123 (U.S.) 93600125 (Non-U.S.)	Produces high gloss with UV protection. Allows chrome to breathe, unlike wax. Good for windshields.	Yes	Yes	Yes	No	
HARLEY TRAVEL CARE KIT 93600149 (U.S. only)	Travel size cleaning and care products. (Not for use on denim finishes.)	Yes	Yes	Yes	No	
LEATHER PROTECTANT 93600034 (U.S.) 93600080 (Non-U.S.)	Weatherproofs and preserves leather products.	No	No	No	No	Leather goods
QUICK WASH 93600162 (U.S.) 93600171 (Non-U.S.)	A quick wash for a lightly soiled motorcycle. Cleans all surfaces, sheeting action prevents spots.	Yes	Yes	Yes	Yes	
SCRATCH & SWIRL REPAIR 93600155 (U.S.) 93600156 (Non-U.S.)	Removes fine scratches and swirls.	Yes	Yes	No	No	
SEAT, SADDLEBAG & TRIM CLEANER 93600167 (U.S.) 93600170 (Non-U.S.)	Cleans and conditions vinyl, leather and plastic. Use on seats, saddlebags, inner fairings and any other trim.	No	No	No	No	Seats, saddlebags and trim

**Table 39. Recommended Cleaning and Care Products**

<b>PRODUCT PART NO.</b>	<b>PURPOSE</b>	<b>FRAME</b>	<b>BODY PANELS</b>	<b>WHEELS</b>	<b>DENIM FINISH</b>	<b>OTHER</b>
SPRAY CLEANER & POLISH 93600029 (U.S.) 93600084 (Non-U.S.)	Aerosol quick cleaner and detailer. Reduces static attraction to dust. Works great for removing bugs. <sup>(1)</sup>	Yes	Yes	Yes	No	
SUNWASH BIKE SOAP 93600129 (U.S.) 93600141 (Non-U.S.)	Thorough washing of all surfaces with a wash mitt. Reduces hard water spots when washing a motorcycle in the sun.	Yes	Yes	Yes	Yes	
WHEEL & TIRE CLEANER 93600121 (U.S.) 93600126 (Non-U.S.)	Removes brake dust and road grime from wheels, tires and whitewalls. Do not use on frames or anodized parts.	No	No	Yes	No	Black-coated exhaust pipes and mufflers

*(1) DO NOT use BARE METAL POLISH or SPRAY CLEANER & POLISH on coated aluminum wheels, protective coating will be removed.*

**Table 40. Recommended Surface Care Products**

<b>PRODUCT PART NO.</b>	<b>PURPOSE</b>
BUG EATER SPONGE 93600110	When paired with water and BUG REMOVER, the BUG EATER SPONGE breaks down and dissolves baked on bugs and road grime.
CLEANING BRUSH KIT 94844-10	Brush kit for detailing your motorcycle.
DETAILING SWABS 93600107	Large cotton swabs for cleaning crevices and detailed surfaces.

**Table 40. Recommended Surface Care Products**

<b>PRODUCT PART NO.</b>	<b>PURPOSE</b>
BIKE WASH BUCKET 93600133	Wash bucket. Includes GRIT GUARD insert.
HOG BLASTER MOTORCYCLE DRYER 94651-09A	Blows a stream of warm dry filtered air. Reduces streaks and water spots.
MICROFIBER APPLICATORS (4 pack) 93600168	Use to apply most wax, coating, sealant, and dressing products.
MICROFIBER DETAILING CLOTH 94663-02	Highly absorbent detailing cloth for polishing and sealing. Contains no nylon fibers.
MICROFIBER DETAILING CLOTHS (3 pack) 93600136	Highly absorbent detailing cloths for polishing and sealing.
MICROFIBER SOFT DRYING TOWEL 93600132	Washable and reusable. Provides a lint- and streak-free drying action for a professional results.
MICROFIBER WASH MITT 93600130	Premium quality microfiber washing mitten. Use with either hand.
WHEEL & SPOKE BRUSH 43078-99	Cone-shaped scrub brush for wheels.

## **WASHING THE MOTORCYCLE**

Use only recommended cleaning and care products. Refer to Table 39 and Table 40.

### *NOTE*

*During rinsing and washing, avoid direct spray on electrical components, air filter element and any luggage or saddlebag*

*sealing areas (if equipped). Avoid spraying water under leather saddlebag covers (if equipped).*

## **Preparation**

1. Allow motorcycle to cool before rinsing or washing. Spraying water on hot surfaces can leave water spots and mineral deposits.

2. Rinse the motorcycle from the bottom up.
3. To loosen dried bugs or hardened dirt, allow surfaces to soak under a damp towel.

### **Cleaning Wheels and Tires**

1. Rinse wheel and tire surfaces. Avoid splashing brake dust on chrome or painted parts.
2. Apply WHEEL & TIRE CLEANER. Allow cleaner to set for one minute.
3. Clean the wheel with a BUG EATER SPONGE or WHEEL & SPOKE BRUSH. Thoroughly scrub all brake dust and other sediments off the wheel. Accumulated brake dust can trap moisture and dirt, which leads to wheel corrosion.
4. Rinse well.

### **Washing the Motorcycle**

#### *NOTE*

*See the appropriate instructions in this section for cleaning leather, denim (flat) finishes, windshields or other special surfaces.*

1. If necessary, use BUG REMOVER to remove bug splatters.
  - a. Rinse the affected surfaces during preparation.

- b. Spray the area with BUG REMOVER.
- c. Wait one minute while the BUG REMOVER penetrates the bug splatters.
- d. Use the BUG EATER SPONGE while washing to easily remove bugs.

2. Prepare the wash.
  - a. Fill a HARLEY WASH BUCKET with clean water.
  - b. Add SUNWASH BIKE SOAP, following the directions on the package.
  - c. Soak the WASH MITT and/or a BUG EATER SPONGE in the SUNWASH solution.
3. Wash all surfaces starting at the top working down toward the ground.
4. Rinse the motorcycle twice in both directions:
  - a. Rinse from the bottom up.
  - b. Rinse from the top down.

### **Drying the Motorcycle**

1. Dry the surfaces from the top down using a SYNTHETIC DRYING CHAMOIS or a HOG BLASTER MOTORCYCLE DRYER. Avoid using any type of forced air on speakers or other sensitive components.

2. Dampen chamois in clean water and wring out the excess. The chamois is more absorbent when wet.
3. Wipe across the vehicle surface.
4. Repeat as necessary until surface is dry.

## Polishing and Sealing

### NOTE

*If motorcycle has denim finish, skip the Polishing and Sealing procedure.*

1. Apply GLAZE POLY SEALANT with a DISPOSABLE DETAILING SOFT CLOTH or MICROFIBER DETAILING CLOTH, following the instructions on the package.
2. Buff with a DISPOSABLE DETAILING SOFT CLOTH.
3. Polish and seal the wheels to prevent corrosion.

## WINDSHIELD CARE

### NOTICE

**Polycarbonate windshields/wind deflectors require proper attention and care to maintain. Failure to maintain polycarbonate properly can result in damage to the windshield/wind deflector. (00483e)**

### NOTICE

**Use only Harley-Davidson recommended products on Harley-Davidson windshields. Do not use harsh chemicals or rain sheeting products, which can cause windshield surface damage, such as dulling or hazing. (00231c)**

- Powdered, abrasive or alkaline cleanser can damage windscreen/windshields. Ammonia-based window cleaners cause permanent yellow effects to windshields.
- Do not use gas station windshield cleaner as finish can be damaged.
- Do not use a brush or squeegee as finish can be damaged.
- Do not clean in hot sun or high temperature.

Windshields require special care. However, windshields can be washed with WINDSHIELD CLEANER - INDIVIDUAL WIPES, SUNWASH BIKE SOAP or QUICK WASH when washing the entire motorcycle. Refer to Table 39.

### NOTE

- Use BUG REMOVER to soft bug splatters. Wipe clean with a BUG EATER SPONGE.
- Covering windshields with a clean, wet cloth for approximately 15-20 minutes before washing makes dried bug removal easier.

1. Use WINDSHIELD CLEANER to detail windshields.
2. Wipe dry with a clean MICROFIBER DETAILING CLOTH.

#### NOTE

*To minimize swirl marks, clean windshield when the motorcycle is cool and parked in the shade. Faint swirl marks are normal. Swirl marks are more visible on tinted windshields.*

## LEATHER AND VINYL CARE

### NOTICE

**Do not use bleach or detergents containing bleach on saddlebags, seats, tank panels or painted surfaces. Doing so can result in equipment damage. (00229a)**

Do not use ordinary soap to clean leather or fur. It could dry or remove the oils from the leather.

Leather, vinyl and other synthetic surfaces must be periodically cleaned and treated to maintain its appearance and extend its life. Clean and treat these surfaces once a season or more frequently under adverse conditions.

These surfaces are not designed for long-term exposure to inclement weather. Protect these surfaces with a Harley-Davidson Seat Rain Cover or Motorcycle Storage Cover (sold separately).

1. Vacuum or blow dust off surface.

2. Thoroughly clean surfaces with SEAT, SADDLEBAG & TRIM CLEANER, following directions on the bottle.
3. Allow the material to dry naturally and completely at room temperature before applying other products to the material. Do not use artificial means to dry the material quickly.
4. For leather only, rejuvenate faded black surfaces with BLACK LEATHER REJUVENATOR, and apply LEATHER PROTECTANT to weatherproof and preserve the leather.

#### NOTE

*Many Harley-Davidson accessories and seats are made of either treated or untreated leather or have leather inserts. Natural materials age differently and require different care than man-made materials. Seat covers and panels made of leather gain "character", such as wrinkles, with age. Leather is porous and organic. Each leather product settles into its own distinct form with use. Your leather product matures into its own custom shape and style from the sun, rain and time. This maturing is natural and enhances the custom quality of your Harley-Davidson motorcycle.*

## DENIM FINISH

Some motorcycles have a denim (flat or matte) finish. The denim finish has qualities which differ from high gloss finishes on all other Harley-Davidson motorcycles. Like denim fabric, denim paint will burnish or mar with age and use, thus adding

character and personality to the finish. For recommended products, refer to Table 39.

- If scratched, the color coat of paint does nick/scuff and these marks cannot be rubbed out.
- If polished, the finish will become less matte and more glossy over time.

## Cleaning Denim Finish

**For Light deposits:** Use DENIM PAINT CLEANER and a SOFTCLOTH.

**For heavier deposits:** Use either SUNWASH BIKE SOAP and a clean H-D WASH MITT or QUICK WASH. Rinse thoroughly with clean water.

## AUDIO SYSTEM CARE

Use only Harley-Davidson recommended products and methods to keep the radio, speakers and other audio system components clean and in good condition. Do not use any abrasives, polishes or rubbing compounds to clean the screen or other components. Do not use any ammonia-based cleaners on the screen. Use of other products or methods may cause damage to components.

## Screen

### NOTE

*Do not use any chemical cleaners or chemical containing wipes or cloths. These can cause damage to the screen surface.*

Gently clean the display glass surface with a clean, dry microfiber cloth. Prior to cleaning it is suggested to remove any deposits of visible dust, dirt, sand particles with a gentle stream of compressed air. Cleaning the display glass in the presence of above can create scratches.

## Cleaning the Radio

Spray a light amount of HARLEY GLOSS on a MICROFIBER DETAILING CLOTH. Be careful to gently remove any sediments without rubbing them into the screen. Apply circular motions from the center and outwards. Use a dry MICROFIBER DETAILING CLOTH to dry the screen. Repeat the process as necessary.

### NOTE

*Do not use any screen enhancing chemicals or products. These can damage the screen surface.*

## Speaker Care

If a haze develops on speakers with a protective grille, use HARLEY SEAT, SADDLEBAG, AND TRIM CLEANER and a SOFTCLOTH or SOFT DETAILING PAD to clean. Do not apply wax or any other similar products on speaker grilles.

Do not use compressed or forced air on speakers.

Vehicles with saddlebag speakers are designed to prevent water intrusion and to allow water to drain during washing or riding in all weather. To remove any standing water from saddlebag speakers, open the saddlebags and gently shake any remaining water from the speakers.

## FAIRING SPLITSTREAM VENT CARE

### Fork Mounted Fairing

Keep the vent free of foreign objects. Periodically clean the vent to remove dirt, bugs and leaves.

1. Using mild soapy water and a soft brush, remove dirt, leaves and bugs from vent.

### Frame Mounted Fairing

Keep the vent free of foreign objects. Periodically clean the vent mechanism to remove dirt, bugs and leaves, and to keep

all parts from sticking. Clean the button and vent door if they become difficult to open or close.

1. With the vent door closed (button up), spray clean water into the area under the button.

### ⚠ WARNING

**Compressed air can pierce the skin and flying debris from compressed air could cause serious eye injury. Wear safety glasses when working with compressed air. Never use your hand to check for air leaks or to determine air flow rates. (00061a)**

2. Blow low-pressure air in the same direction.
3. Using mild soapy water and a soft brush, remove dirt, leaves and bugs from vent duct and vent door.
4. Operate vent and repeat cleaning as necessary.

## EXHAUST CARE

Allow exhaust components to cool before cleaning.

For chrome exhaust surfaces, apply Boot Mark Remover to remove boot marks, melted plastic or asphalt resin. Allow the

gel to set for a few minutes, scrape off the melted material, and rinse clean.

For black-coated exhaust surfaces, apply Wheel & Tire Cleaner while motorcycle is wet during washing. Wipe or scrub exhaust surfaces and rinse clean.

#### NOTE

*There is no warranty on exhaust pipes and mufflers with regard to any discoloration. Blueing is caused by tuning characteristics, cam timing, over-heating, and so on. It is not caused by defective manufacturing.*

## WHEEL CARE

Wheels can corrode or be cosmetically damaged if they are not properly cleaned, polished and preserved. Cleaning and

sealing wheels with the proper treatment guards against pitting, corrosion, spots and stains. Harley-Davidson recommends that wheels be cared for weekly. Corrosion to wheels is not considered a defect in materials or workmanship.

#### NOTE

*Bare aluminum wheels do not have a protective coating and corrode unless properly treated. Apply BARE ALUMINUM WHEEL PROTECTANT when purchasing the motorcycle and at least twice per year to prevent cosmetic damage.*

Keep wheels clean from harsh chemicals, acid-based wheel cleaners, salt and accumulated brake dust. After washing wheels with WHEEL & TIRE CLEANER, use the polish and sealing products according to the type of wheels. Refer to Table 41.

**Table 41. Wheel Polish and Sealing Products**

WHEELS	PRODUCT	DESCRIPTION
Anodized	GRAPHENE	Cleans surface, removes fine scratches. Provides a breathable sealant against acid, chemicals, salt and brake dust.
	GLOSS DETAILER	Seals and protects against harsh chemicals, salt and other sediments to prevent corrosion.

**Table 41. Wheel Polish and Sealing Products**

WHEELS	PRODUCT	DESCRIPTION
Chrome	CHROME CLEAN & SHINE	Non-abrasive cleaner to brighten chrome wheels.
	GLOSS DETAILER	Seals and protects against harsh chemicals, salt and other sediments to prevent oxidation.
Polished and bare aluminum or stainless steel	BARE METAL POLISH <sup>(1)</sup>	Microabrasive polish to refurbish polished wheels. Do not use on chrome.
<i>(1) DO NOT use BARE METAL POLISH on coated aluminum wheels, protective coating will be removed.</i>		

## WHITEWALL TIRES

Use HARLEY-DAVIDSON WHEEL & TIRE CLEANER to clean whitewall tires following directions on the bottle.

## STORING MOTORCYCLE

If the motorcycle will not be operated for several months, take steps to protect the motorcycle. Always protect parts against corrosion, preserve the battery and prevent the build-up of gum and varnish in the fuel before storage.

Make a list of everything you do and fasten it to a handlebar grip. When you take the motorcycle out of storage, this list is your reference/checklist to get your motorcycle in operating condition.

### ⚠ WARNING

**Do not store motorcycle with gasoline in tank within the home or garage where open flames, pilot lights, sparks or electric motors are present. Gasoline is extremely flammable and highly explosive, which could result in death or serious injury. (00003a)**

1. Fill fuel tank. Add a gasoline stabilizer. Use one of the commercially available gasoline stabilizers and follow the manufacturer's instructions.
2. Warm motorcycle to operating temperature. Change oil and turn engine over to circulate the new oil. See MAINTENANCE AND LUBRICATION > CHANGE OIL AND OIL FILTER (Page 168).
3. Prepare battery for storage. See SERVICE PROCEDURES > BATTERY MAINTENANCE (Page 197).

4. Check and fill the cooling system on applicable vehicles. See MAINTENANCE AND LUBRICATION > COOLING SYSTEM (Page 177).
5. To protect the body panels, engine, chassis and wheels from corrosion, follow the cosmetic care procedures before storage. See AFTER RIDING > CLEANING AND GENERAL CARE (Page 149).
6. Cover the motorcycle with a material such as light canvas that breathes. Plastic materials that do not breathe promote condensation and corrosion.



## SAFE OPERATING MAINTENANCE

### ⚠ WARNING

Perform the service and maintenance operations as indicated in the regular service interval table. Lack of regular maintenance at the recommended intervals can affect the safe operation of your motorcycle, which could result in death or serious injury. (00010a)

### ⚠ WARNING

If you operate your motorcycle under adverse conditions (severe cold, extreme heat, very dusty environment, very bad roads, through standing water, etc.), you should perform the regular maintenance intervals more frequently to ensure the safe operation of your motorcycle. Failure to maintain your motorcycle could result in death or serious injury. (00094a)

### NOTICE

When lifting a motorcycle using a jack, be sure jack contacts both lower frame tubes where down tubes and lower frame tubes converge. Never lift by jacking on cross-members, oil pan, mounting brackets, components or housings. Failure to comply can cause serious damage resulting in the need to perform major repair work. (00586d)

Keep the motorcycle maintained according to SERVICE INTERVALS AND RECORDS > SERVICE RECORDS (Page 261). Frequently inspect the motorcycle between regular service intervals and after periods of storage to determine if additional maintenance is necessary.

Check the following items:

1. Tires for correct pressure, excessive wear or any signs of tire damage.
2. Belt for proper tension, wear or damage.
3. Brakes, steering and throttle for responsiveness and freedom from binding.
4. Brake fluid level and condition. Hydraulic lines and fittings for leaks. Coolant level if applicable. Also, check brake pads and discs for wear.
5. Cables for fraying or crimping and free operation.
6. Engine oil and primary chaincase/transmission fluid levels.
7. Headlamp, tail lamp, brake lamp and turn signals for proper operation.

## BREAK-IN MAINTENANCE

### NOTE

*The performance of new motorcycle initial service is required to keep your new motorcycle warranty in force and for proper emissions system operation.*

After a new motorcycle has been ridden 1,600 km (1000 mi), visit an authorized Harley-Davidson dealer for initial service. Refer to SERVICE INTERVALS AND RECORDS > SERVICE RECORDS (Page 261).

## PREPARING THE MOTORCYCLE FOR MAINTENANCE

### ⚠ WARNING

Be sure to check capacity rating and condition of hoists, slings, chains and cables before use. Exceeding capacity ratings or using lifting devices that are in poor condition can lead to an accident, which could result in death or serious injury. (00466c)

### NOTE

Always support a motorcycle that is being serviced with blocks or stands.

## Setting Motorcycle Upright

1. Place motorcycle upright on a level surface or suitable lift, if available.
2. Verify that the motorcycle is level.
3. Secure with tie-downs.

## DISPOSAL AND RECYCLING

Help protect our environment! Many communities maintain facilities for recycling used fluids, plastics and metals. Dispose of or recycle used oil, lubricants, fuel, coolant, brake fluid and batteries in accordance with local regulations. Many Harley-Davidson parts and accessories are made of plastics and metals which can also be recycled.

## ENGINE LUBRICATION

### Engine Lubrication

### ⚠ CAUTION

Prolonged or repeated contact with used motor oil may be harmful to skin and could cause skin cancer. Promptly wash affected areas with soap and water. (00358b)

### ⚠ CAUTION

If engine oil is swallowed, do not induce vomiting. Contact a physician immediately. In case of contact with eyes, immediately flush with water. Contact a physician if irritation persists. (00357d)

### NOTICE

Do not switch lubricant brands indiscriminately because some lubricants interact chemically when mixed. Use of inferior lubricants can damage the engine. (00184a)

Always use the proper grade of oil for the lowest temperature expected before the next scheduled oil change. Refer to Table 42.

This motorcycle was originally equipped with GENUINE HARLEY-DAVIDSON H-D 360 MOTORCYCLE OIL 20W50. H-D 360 is the preferred oil under normal operating conditions. If operation under extreme cold or heat are expected, refer to Table 42 for alternative choices.

If necessary and H-D 360 is not available, add oil certified for diesel engines. Acceptable designations include: CH-4, CI-4 and CJ-4. The preferred viscosities, in descending order are: 20W50, 15W40 and 10W40.

At the first opportunity, see an authorized dealer to change back to 100 percent Harley-Davidson oil.

**Table 42. Recommended Engine Oils**

TYPE	VISCOSITY	LOWEST AMBIENT TEMPERATURE	COLD-WEATHER STARTS BELOW 50 °F (10 °C)
Screamin' Eagle SYN3 Full Synthetic Motorcycle Lubricant	SAE 15W50	Above -1 °C (30.2 °F)	Excellent
Screamin' Eagle SYN3 Full Synthetic Motorcycle Lubricant	SAE 20W50	Above -1 °C (30.2 °F)	Excellent
Genuine Harley-Davidson H-D 360 Motorcycle Oil	SAE 20W50	Above 4 °C (39.2 °F)	Good
Genuine Harley-Davidson H-D 360 Motorcycle Oil	SAE 50	Above 16 °C (60.8 °F)	Poor
Genuine Harley-Davidson H-D 360 Motorcycle Oil	SAE 60	Above 27 °C (80.6 °F)	Poor

### Low Temperature Lubrication

Change engine oil often in colder climates. If motorcycle is frequently ridden less than 24 km (15 mi), in ambient

temperatures below 16 °C (60 °F), reduce oil change intervals to 2,400 km (1500 mi).

### NOTE

Lower ambient temperatures require more frequent oil changes.

Water vapor is a normal by-product of combustion. During cold-weather operation, some water vapor condenses to liquid form on the cool surfaces inside the engine. In freezing weather, this water becomes slush or ice. If the engine is not warmed to operating temperature, accumulated slush or ice blocks the oil lines and causes engine damage. Over time, water will accumulate, mix with the engine oil and form a sludge that is harmful to the engine.

If the engine is allowed to warm to normal operating temperature, most of the water evaporates and exits through the crankcase breather.

## CHECK ENGINE OIL LEVEL

### ▲ CAUTION

**Prolonged or repeated contact with used motor oil may be harmful to skin and could cause skin cancer. Promptly wash affected areas with soap and water. (00358b)**

### NOTICE

**Do not overfill oil. Doing so can result in oil carryover to the air cleaner leading to equipment damage and/or equipment malfunction. (00190b)**

### NOTE

Check engine oil level at each complete fuel refill.

## Oil Level Cold Check

1. Place vehicle on level ground resting on the jiffy stand.

### NOTE

*Oil level on a cold engine should never be above the midway point.*

2. See Figure 62. Check engine oil level.
  - a. Remove filler plug/dipstick.
  - b. Wipe off the dipstick.
  - c. Insert the dipstick and tighten into the fill spout.
  - d. Remove filler plug/dipstick.
  - e. See Figure 63. Check oil level. The correct cold oil level is midway (2) between the ADD QT (1) and FULL HOT (3) marks on the dipstick.
3. If oil level is at or below the ADD QT mark, add only enough oil to bring the level to the ADD QT mark.
4. Start and idle engine on jiffy stand for two minutes. Turn off engine.

5. Check oil level. Add only enough to bring level midway between the ADD QT (1) and FULL HOT (3).

## Oil Level Hot Check

### NOTICE

**Do not allow hot oil level to fall below Add/Fill mark on dipstick. Doing so can result in equipment damage and/or equipment malfunction. (00189a)**

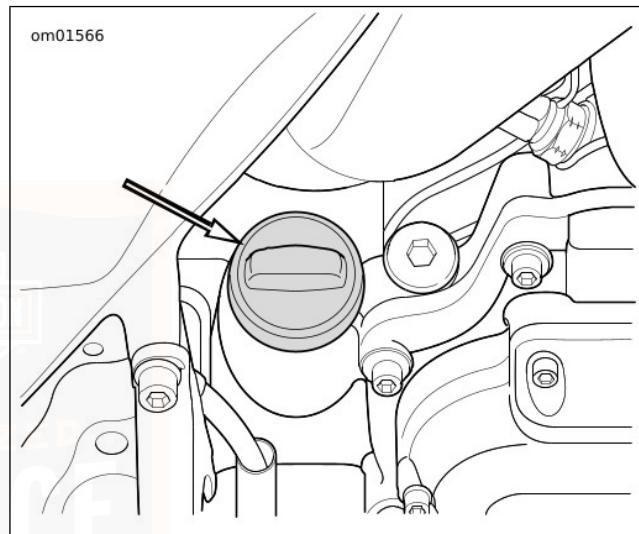
### NOTE

*Perform engine oil level hot check only with engine oil at normal operating temperature.*

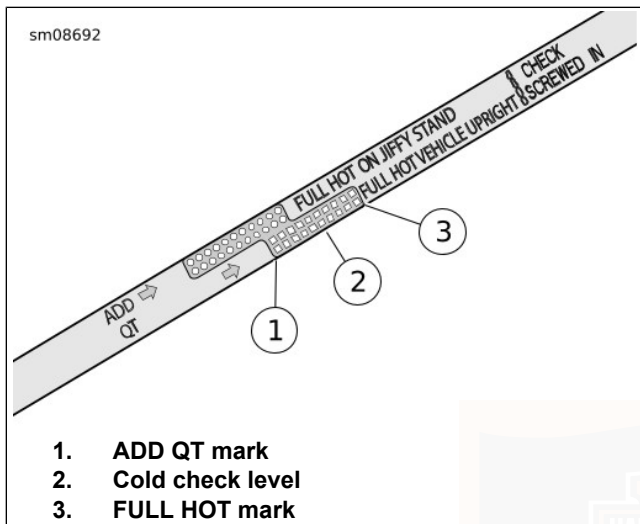
1. Ride motorcycle until engine oil reaches at least 93 °C (200 °F) or higher.
2. Allow engine to idle for 1-2 minutes on jiffy stand. Turn off engine.
3. See Figure 62. Check oil level.
  - a. Remove filler plug/dipstick.
  - b. Wipe off the dipstick.
  - c. Insert the dipstick and tighten into the fill spout.
  - d. Remove filler plug/dipstick.

- e. See Figure 63. Check oil level. Oil level must register between the ADD QT and FULL HOT marks on the dipstick.

4. If oil level is at or below the ADD QT mark, add only enough oil to bring the level to the FULL HOT mark. Do not overfill.



**Figure 62. Engine Oil Filler Plug**



**Figure 63. Engine Oil Dipstick (VEHICLE UPRIGHT Gauge)  
CHANGE OIL AND OIL FILTER**

**⚠ WARNING**

Be sure that no lubricants or fluids get on tires, wheels or brakes when changing fluid. Traction can be adversely affected, which could result in loss of control of the motorcycle and death or serious injury. (00047d)

**NOTICE**

Do not switch lubricant brands indiscriminately because some lubricants interact chemically when mixed. Use of inferior lubricants can damage the engine. (00184a)

**⚠ CAUTION**

Prolonged or repeated contact with used motor oil may be harmful to skin and could cause skin cancer. Promptly wash affected areas with soap and water. (00358b)

- Change engine oil at the first 1,600 km (1000 mi) for a **new** engine. After the initial service, change oil at regular intervals in normal service at warm or moderate temperatures. Refer to SERVICE INTERVALS AND RECORDS > SERVICE RECORDS (Page 261).
- Change oil at more frequent intervals in cold weather or severe operating conditions. See Winter Lubrication in MAINTENANCE AND LUBRICATION > ENGINE LUBRICATION (Page 164).

1. Run motorcycle until engine is at normal operating temperature. Turn off engine.
2. Remove filler plug/dipstick.

**NOTE**

*Replace drain plug O-ring.*

3. See Figure 64. Remove the oil drain plug (2) and O-ring. Allow oil to drain completely.

**NOTE**

*Use P&A Oil Catcher (Part No. 62700199) or equivalent to keep drain oil off crankcase when removing oil filter. Residual drain oil could falsely appear as a crankcase oil leak at a later time.*

4. Remove the oil filter using oil filter wrench and hand tools. Do not use with air tools.

Special Tool: OIL FILTER WRENCH (94863-10)

Special Tool: OIL FILTER WRENCH (94686-00)

5. Clean the oil filter mount flange.
6. Clean any residual oil from crankcase and transmission housing.
7. See Figure 65. Install **new** oil filter.
  - a. Lubricate gasket with a thin film of clean engine oil.
  - b. Install **new** oil filter.
  - c. Hand-tighten oil filter one-half to three-quarters of a turn after gasket first contacts filter mounting surface. Do NOT use oil filter wrench for installation.

8. Install engine oil drain plug and **new** O-ring.

Torque: 19–28.5 N·m (14–21 ft-lbs) *Engine oil drain plug*

**NOTE**

*Use the proper grade of oil for the lowest temperature expected before the next oil change. Refer to Table 42 for recommended oil.*

9. Add an initial volume of engine oil. Refer to Table 43.

**Table 43. Initial Oil Fill**

ITEM	QUANTITY
Engine oil initial fill	3.8 L (4.0 qt)

10. Verify proper oil level. See MAINTENANCE AND LUBRICATION > CHECK ENGINE OIL LEVEL (Page 166).
  - a. Perform engine oil level **cold check**.
  - b. Start engine and carefully check for oil leaks around drain plug and oil filter.
  - c. Perform engine oil level **hot check**.

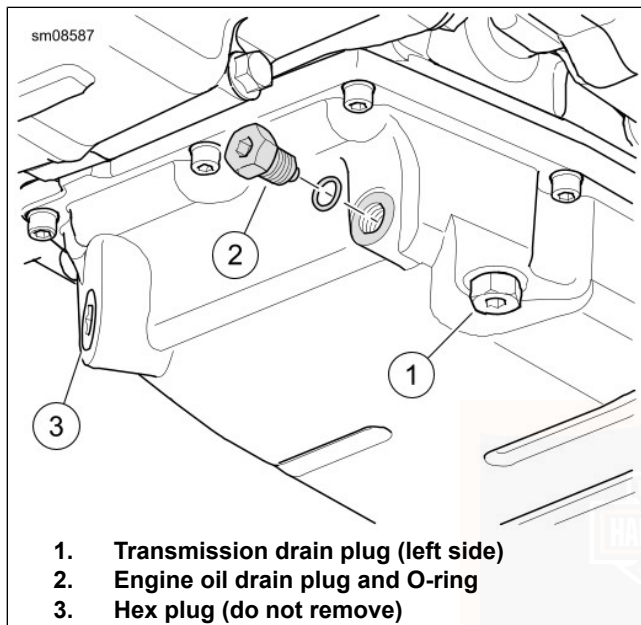


Figure 64. Oil Pan

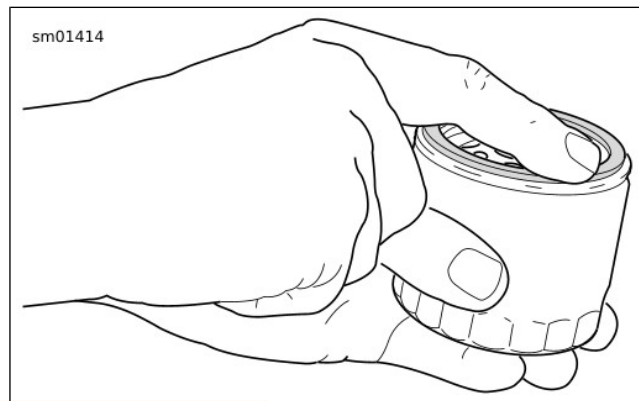


Figure 65. Lubricating New Oil Filter Gasket

## OIL COOLER

Models that are not Twin-Cooled have an oil cooler. Some also have a oil cooler fan. Keep the cooler and fan clean and free from dirt and debris to maintain maximum cooling efficiency.

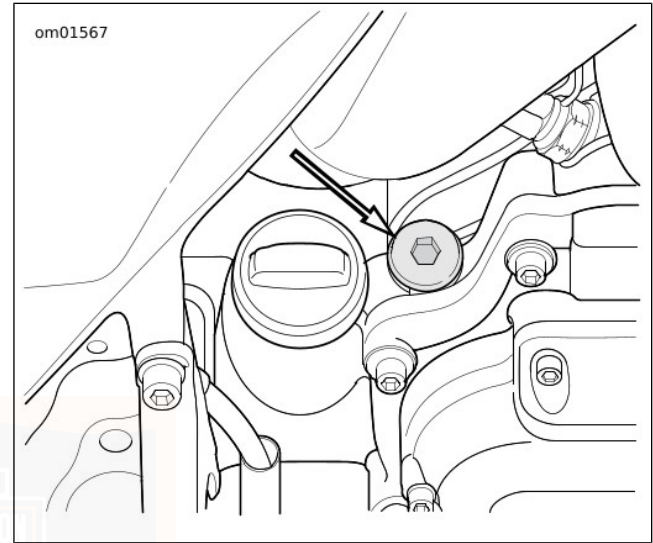
## CHECK TRANSMISSION LUBRICANT

### NOTE

Check transmission fluid with the motorcycle at ambient temperature. Inspect transmission dipstick O-ring. Replace if necessary.

1. Park motorcycle on a level surface on jiffy stand.
2. See Figure 66. Remove transmission filler plug/dipstick. Wipe dipstick clean.
3. Install filler plug/dipstick until O-ring contacts the case. Do not tighten.
4. See Figure 67. Remove filler plug/dipstick. Check lubricant level on dipstick. Proper oil level is between the Add (A) (1) and Full (F) (2) marks.
5. If lubricant level is low, add recommended Harley-Davidson lubricant to bring level to between the A mark and the F marks. Refer to Table 44.
6. Install filler plug/dipstick. Tighten to specification.

Torque: 2.8–8.5 N·m (25–75 **in-lbs**) *Transmission filler plug/dipstick*



**Figure 66. Transmission Filler Plug/Dipstick Location**

AUTHORIZED  
SERVICE

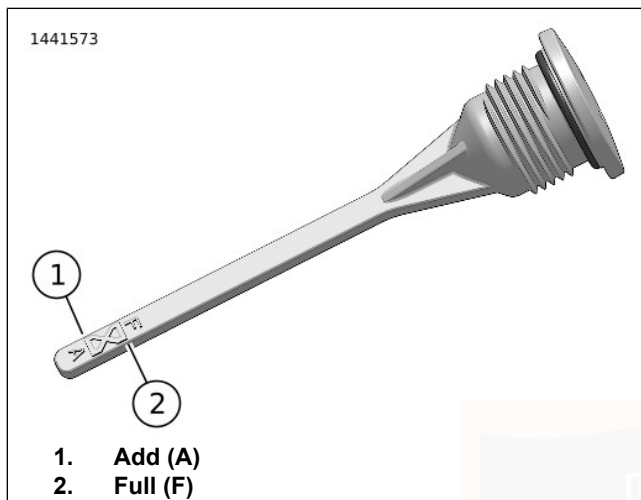


Figure 67. Transmission Lubricant Level

Table 44. Recommended Transmission Lubricants

LUBRICANT	QUANTITY *	
	fl oz	L
FORMULA+ TRANSMISSION AND PRIMARY CHAINCASE LUBRICANT	28	0.83
SCREAMIN' EAGLE SYN3 FULL SYNTHETIC MOTORCYCLE LUBRICANT 20W50	28	0.83
* Fill quantity for a transmission lubricant change.		

## CHANGE TRANSMISSION LUBRICANT

1. See Figure 67. Remove transmission filler plug/dipstick.

### ⚠ WARNING

Be sure that no lubricants or fluids get on tires, wheels or brakes when changing fluid. Traction can be adversely affected, which could result in loss of control of the motorcycle and death or serious injury. (00047d)

2. See Figure 68. Remove transmission drain plug. Drain transmission.
3. Clean and inspect drain plug and O-ring.

### NOTICE

Do not over-tighten filler or drain plug. Doing so could result in a lubricant leak. (00200b)

4. Install drain plug with **new** O-ring. Tighten. Do not over-tighten.  
Torque: 19–28.5 N·m (14–21 ft-lbs) *Transmission drain plug*

5. Fill the transmission with recommended Harley-Davidson lubricant. Refer to Table 44.  
Volume: 0.83 L (28 fl oz)
6. Check lubricant level. Add enough lubricant to bring the level between the add (A) and full (F) marks. See Figure 67.
7. Install filler plug/dipstick. Tighten.  
Torque: 2.8–8.5 N·m (25–75 **in-lbs**) *Transmission filler plug/dipstick*

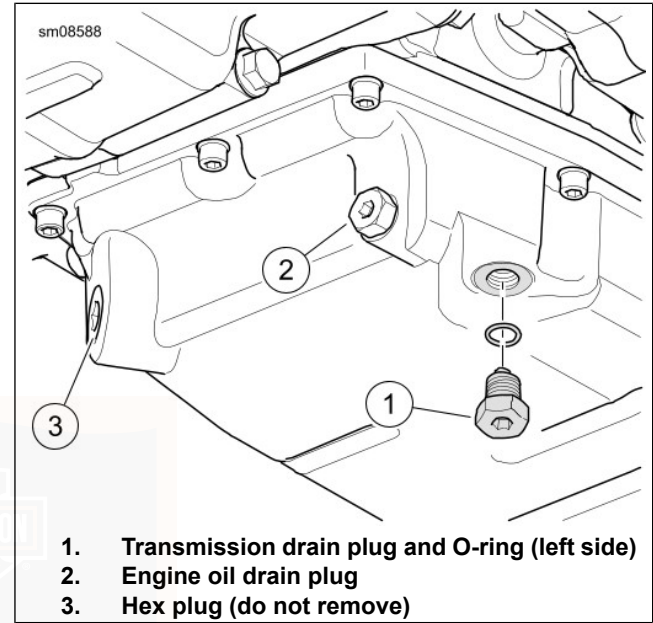


Figure 68. Transmission Drain

## CHANGE PRIMARY CHAINCASE LUBRICANT

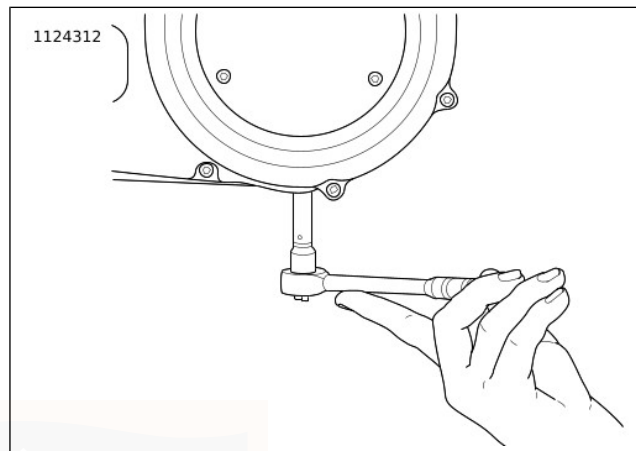
1. Run motorcycle until engine is at normal operating temperature. Turn off engine.

**▲ WARNING**

Be sure that no lubricants or fluids get on tires, wheels or brakes when changing fluid. Traction can be adversely affected, which could result in loss of control of the motorcycle and death or serious injury. (00047d)

2. Secure motorcycle upright (not leaning on jiffy stand) on a level surface.
3. See Figure 69. Drain primary chaincase.
4. Clean drain plug magnet. If plug has excessive debris, inspect the condition of chaincase components.
5. Install drain plug and **new** O-ring. Tighten.

Torque: 19–28.5 N·m (14–21 ft-lbs) *Primary chaincase drain plug*



**Figure 69. Removal/Installation of Chaincase Drain Plug**

6. See Figure 71. Remove screws (3) and clutch inspection cover (2).
7. Remove seal (1). Wipe oil from groove in chaincase cover and mounting surface.

## NOTICE

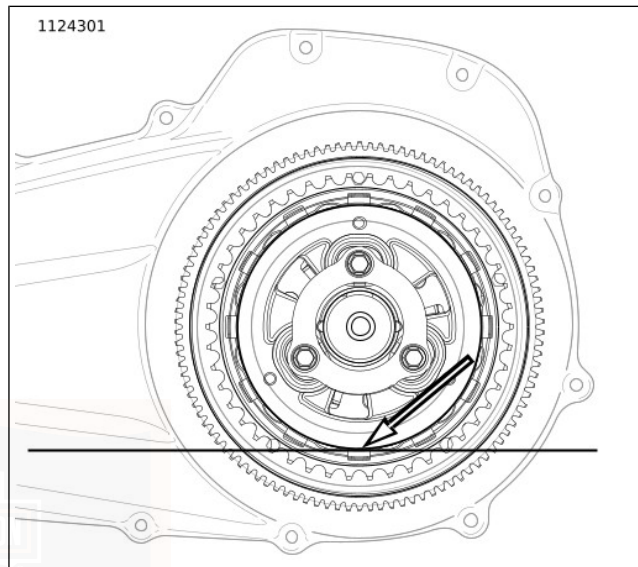
Do not overfill the primary chaincase with lubricant. Overfilling can cause rough clutch engagement, incomplete disengagement, clutch drag and/or difficulty in finding neutral at engine idle. (00199b)

8. Add lubricant.
  - a. Pour specified amount of FORMULA+ TRANSMISSION AND PRIMARY CHAINCASE LUBRICANT or SCREAMIN' EAGLE SYN3 FULL SYNTHETIC MOTORCYCLE LUBRICANT 20W50 through clutch inspection cover opening. Refer to Table 45.
  - b. See Figure 70. Proper level is approximately at bottom of pressure plate OD.

**Table 45. Primary Chaincase Lubricant**

ITEM	DRY FILL <sup>(2)</sup>		WET FILL <sup>(3)</sup>	
	Oz	L	Oz	L
Amount <sup>(1)</sup>	34	1.0	30	0.9

(1) Amount is approximate. Fill to bottom of pressure plate OD with vehicle upright.  
(2) Cover was removed and installed.  
(3) Lubricant was drained through the drain plug only.



**Figure 70. Primary Lubricant Level**

9. Install clutch inspection cover and **new** seal:
  - a. Thoroughly wipe all lubricant from cover mounting surface and groove in chaincase cover.

- b. See Figure 71. Position **new** seal (1) in groove in clutch inspection cover (2). Press each of the nubs on seal into the groove.
- c. Secure clutch inspection cover (2) with screws with captive washers (3).
- d. See Figure 72. Tighten in sequence shown to 9.5–12.2 N·m (84–108 **in-lbs**).

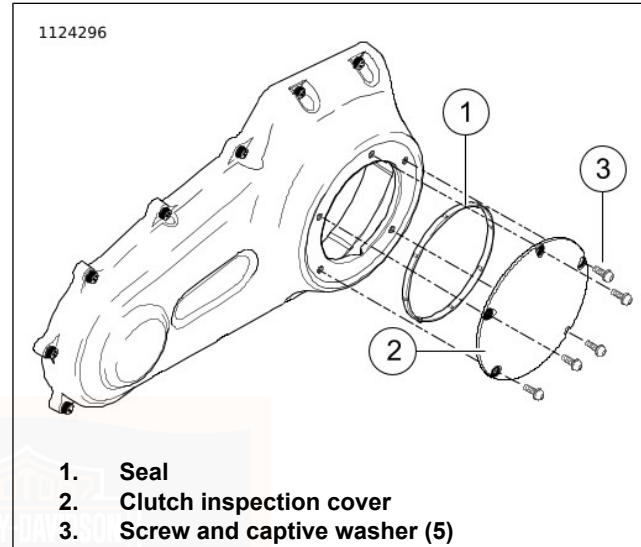


Figure 71. Clutch Cover (Typical)

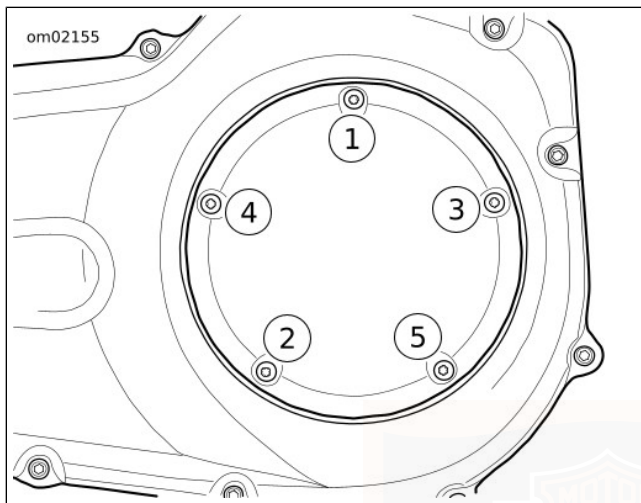


Figure 72. Clutch Cover Tightening Sequence

## COOLING SYSTEM

### ▲ WARNING

Coolant mixture contains toxic chemicals, which may be fatal if swallowed. If swallowed, do not induce vomiting; call a physician immediately. Use in a well ventilated area. Irritation to skin or eyes can occur from vapors or direct contact. In case of skin or eye contact, flush thoroughly with water and go to hospital, if necessary. Dispose of used coolant according to federal, state and local regulations. (00092a)

### ▲ CAUTION

At operating temperature, radiators and oil coolers contain hot fluids. Contact with a radiator or oil cooler can result in minor or moderate burns. (00141b)

### NOTICE

Use only Genuine Harley-Davidson Extended Life Antifreeze and Coolant. Use of other coolants/mixtures may lead to motorcycle damage. (00179c)

GENUINE HARLEY-DAVIDSON EXTENDED LIFE ANTIFREEZE AND COOLANT is pre-diluted and ready to use full strength. It provides temperature protection to  $-36.7^{\circ}\text{C}$  ( $-34^{\circ}\text{F}$ ). DO NOT add water.

## NOTICE

**De-ionized water must be used with the antifreeze in the cooling system. Hard water can cause scale accumulation in water passages which reduces cooling system efficiency, leading to overheating and motorcycle damage. (00195b)**

If GENUINE HARLEY-DAVIDSON EXTENDED LIFE ANTIFREEZE AND COOLANT is unavailable, a mixture of de-ionized water and ethylene glycol-based antifreeze may be used. At the first opportunity, change back to GENUINE HARLEY-DAVIDSON EXTENDED LIFE ANTIFREEZE AND COOLANT.

### Checking Coolant Level

#### NOTE

*Check coolant level with engine cold and motorcycle on level ground.*

1. Remove access panel from lower right fairing. Pry the center top and pull out to release retainers.

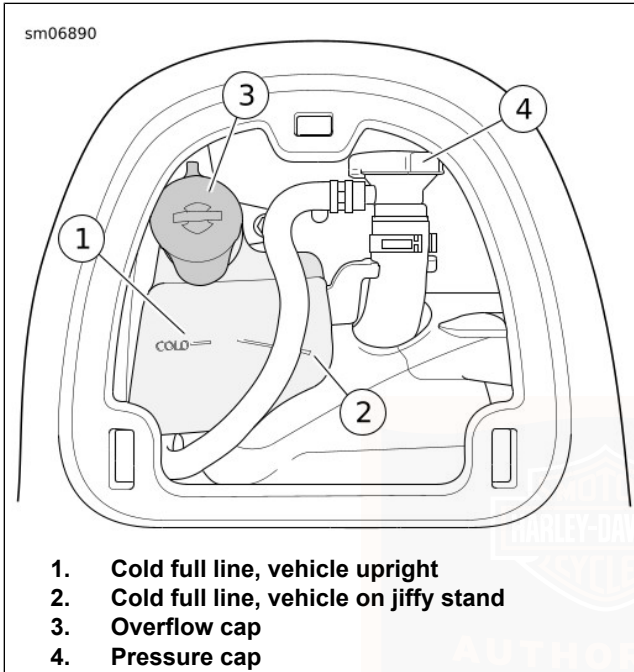
#### NOTE

*See Figure 73. The coolant bottle has two lines. Use the angled line (2) when the motorcycle is leaning on the jiffy stand.*

2. See Figure 73. Check that coolant level in coolant bottle is at or slightly above the "COLD" line (1).

#### NOTE

- *Do not remove the pressure cap (4). Fill the coolant bottle by removing the rubber plug (3).*
  - *If the coolant bottle is empty when the engine is cold, inspect the system for leaks. Repair as needed. Fill system with coolant and perform bleed procedure. See a Harley-Davidson dealer for service.*
3. If level is below "COLD" line on tank, remove rubber plug (3). Add GENUINE HARLEY-DAVIDSON EXTENDED LIFE ANTIFREEZE AND COOLANT until fluid level reaches, or is slightly above the "COLD" line.
  4. Install rubber plug.
  5. Install access panel.



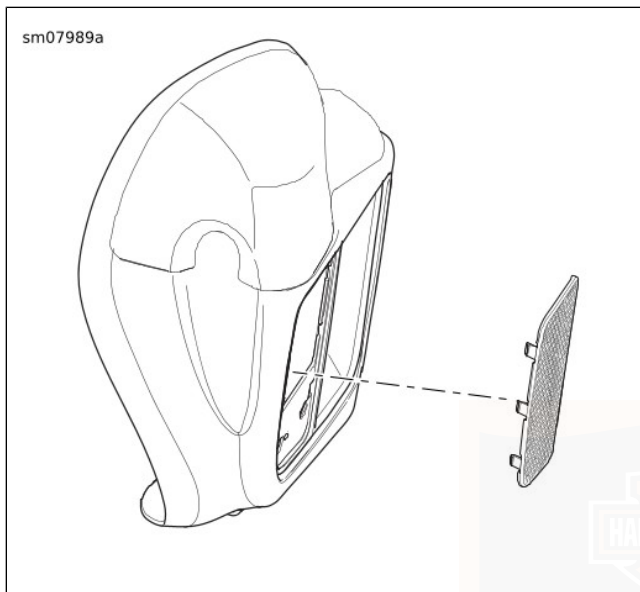
**Figure 73. Coolant Level**

## Clean Radiators

### NOTICE

**Clean the inlet surface of the radiator regularly. Leaves and other debris can collect on the radiator surface and degrade radiator performance which could lead to overheating and motorcycle damage. (00197d)**

1. See Figure 74. Remove outer grille from lower fairing.
  - a. Carefully pry on curved edge of panel to release latches.
  - b. Remove from fascia.
2. Clean debris from radiator fins.
3. Install outer grille.



**Figure 74. Lower Fairing Grille Panel**

## Checking Coolant Freeze Point

See a HARLEY-DAVIDSON dealer for coolant freeze point test.

## CHECKING FOR EXHAUST LEAKS

Refer to SERVICE INTERVALS AND RECORDS > SERVICE RECORDS (Page 261) for all maintenance schedules.

1. Allow exhaust components to cool.
2. Check exhaust system for obvious signs of leakage such as carbon marks or marks at pipe joints.
  - a. Check for loose or missing fasteners.
  - b. Check for fractured pipe clamps or brackets.
  - c. Check for loose or fractured exhaust shields.
3. Correct any detected leaks. See a Harley-Davidson dealer.

## CHECK DRIVE BELT DEFLECTION

### NOTE

*Always use BELT TENSION GAUGE (PART NUMBER: HD-35381-A) to measure belt deflection. Failure to use tension gauge may cause under-tensioned belts. Loose belts can fail due to "ratcheting" (jumping a tooth) which causes tensile cord crimping and breakage.*

Check deflection:

- With transmission in neutral.

- With motorcycle at ambient temperature.
- With motorcycle upright or on jiffy stand with rear wheel on the ground.
- With the vehicle unladen: no rider, no luggage and empty saddlebags.

**▲ WARNING**

**To prevent accidental vehicle start-up, which could cause death or serious injury, remove main fuse before proceeding. (00251b)**

1. Disarm security system. Remove main fuse. See SERVICE PROCEDURES > FUSES (Page 203).
2. Shift transmission to neutral.

*NOTE*

*When adjusting a **new** belt, rotate rear wheel a few revolutions prior to setting the tension.*

3. See Figure 75. Measure belt deflection using:  
Special Tool: BELT TENSION GAUGE (HD-35381-A)
  - a. Slide O-ring (4) to zero mark (3).

- b. **Models equipped with belt deflection window:**  
Fit belt cradle (2) against bottom of drive belt in line with belt deflection window.
- c. **All other models:** Fit belt cradle (2) against bottom of drive belt halfway between drive pulleys.
- d. Press upward on knob (6) until O-ring slides down to 4.54 kg (10 lb) mark (5) and hold steady.

4. Measure belt deflection:

- a. **Models equipped with belt deflection window:**  
See Figure 77. Measure belt deflection as viewed through belt deflection viewing window while holding gauge steady. Each deflection graduation is approximately 1.6 mm (1/16 in)
- b. **All other models:** See Figure 76. Measure amount of deflection (4) while holding gauge steady.

5.

*NOTE*

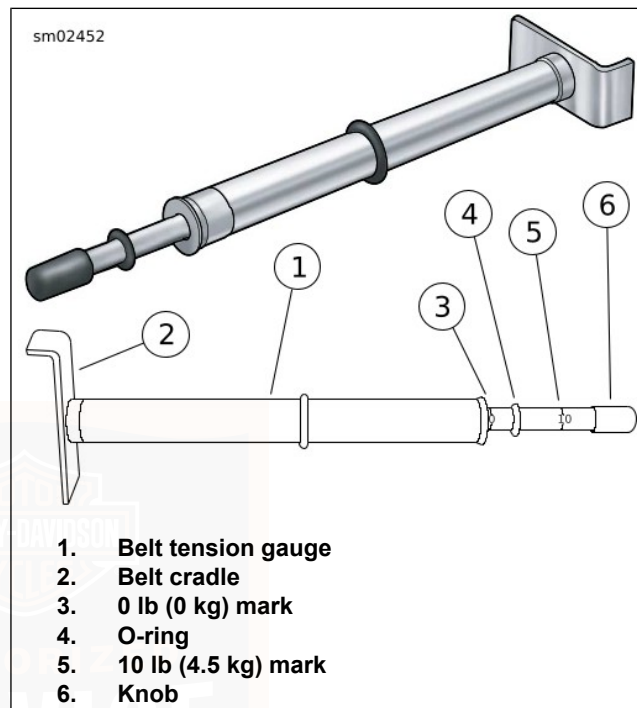
*Set to the lower (tightest) specification if the belt has less than 1,600 km (1000 mi).*

Compare with specifications. Refer to Table 46. If not within specifications, see a Harley-Davidson dealer.

6. Install main fuse.

**Table 46. Belt Deflection**

MODEL	IN	MM
Electra Glide® Standard (FLHT)	1/4-7/16	6.4-11.1
Road Glide® (FLTRX)		
Road Glide® Special (FLTRXS)		
Road King® Special (FLHRXS)		
Street Glide® (FLHX)		
Street Glide® Special (FLHXS) (low profile shock absorbers)	3/8-9/16	9.5-14.3
All other Touring models (standard shock absorbers)		



**Figure 75. Belt Tension Gauge**

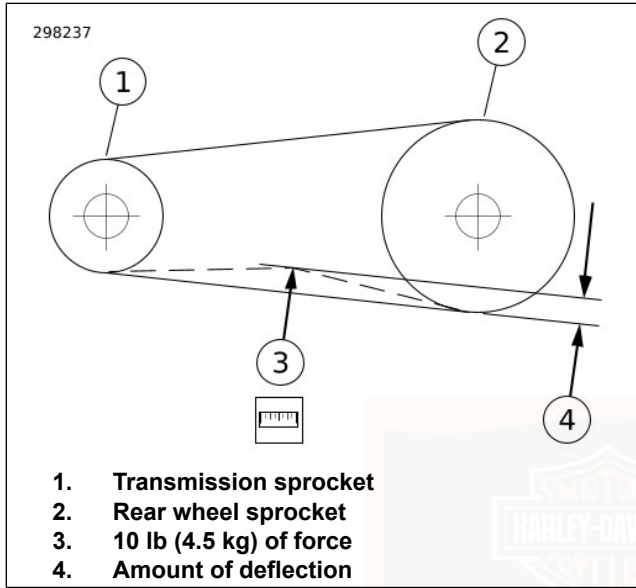


Figure 76. Checking Belt Deflection

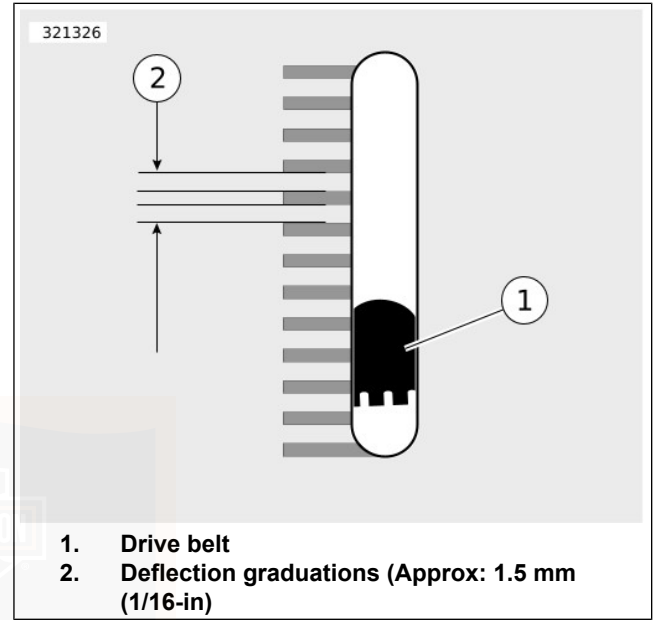


Figure 77. Belt Deflection Window

## MISCELLANEOUS LUBRICATION

Inspect and lubricate the following components according to the maintenance schedule. Refer to SERVICE INTERVALS AND RECORDS > SERVICE RECORDS (Page 261).

- Front brake lever pivot

- Clutch control cable (use HARLEY LUBE)
- Clutch control hand lever pivot
- Foot shift lever pivot
- Rear brake lever pivot
- Hinges and latches (such as fuel door and footrests)
- Locks, as required
- Jiffy stand (use ANTI-SEIZE LUBRICANT)

Use HARLEY LUBE unless otherwise specified.

If motorcycle is operated on muddy or dusty roads, clean and lubricate more frequently.

## MECHANICAL CLUTCH

### NOTICE

**The clutch control cable must be oiled and adjusted periodically to compensate for lining wear. Failure to oil and adjust the clutch control cable can result in equipment damage. (00203c)**

Adjust the clutch control cable at specified intervals. Refer to SERVICE INTERVALS AND RECORDS > SERVICE RECORDS (Page 261).

If the clutch slips under load or drags when released, the control cable may need to be adjusted or clutch service may need to be performed. See a Harley-Davidson dealer for service.

## HYDRAULIC LIFTERS

The hydraulic lifters are self-adjusting. They automatically adjust length to compensate for engine expansion and valve mechanism wear. This keeps the valve mechanism free of lash when the engine is running.

When starting an engine which has been turned off even for a few minutes, the valve mechanism may be slightly noisy until the hydraulic units completely refill with oil. If at any time the valve mechanism becomes abnormally noisy, other than for a short period immediately after engine is started, it is an indication that one or more of the hydraulic units may not be functioning properly.

Always check the engine oil level first since normal circulation of oil through the engine is necessary for proper operation of the hydraulic lifters.

If engine oil is at the proper level, the lifters may not be functioning properly because of dirt in the oil supply passages leading to the lifter units. See a Harley-Davidson dealer for service.

## MAINTAINING FRONT FORK

### ⚠ WARNING

**Regularly inspect shock absorbers and front forks. Replace leaking, damaged or worn parts that can adversely affect stability and handling, which could result in death or serious injury. (00012a)**

Have a Harley-Davidson dealer drain the front fork oil and refill at proper intervals.

Rebound action of the fork will be impaired if the fork oil level is low.

If fork does not appear to be working properly or a significant oil leak should develop, see a Harley-Davidson dealer.

Refer to SERVICE INTERVALS AND RECORDS > SERVICE RECORDS (Page 261) for all maintenance schedules.

## ADJUSTING STEERING HEAD BEARINGS

### ⚠ WARNING

**Adjustments to steering head bearings should be performed by a Harley-Davidson dealer. Improperly adjusted bearings can adversely affect handling and stability, which could result in death or serious injury. (00051b)**

Refer to SERVICE INTERVALS AND RECORDS > SERVICE RECORDS (Page 261) for all maintenance schedules.

See a Harley-Davidson dealer to adjust the steering head bearings.

## BRAKES

### ⚠ WARNING

**DOT 4 brake fluid absorbs moisture from the atmosphere over time, changing the properties of the fluid. Check brake fluid moisture content at every service interval or annually (whichever comes first). Flush and replace the brake fluid every two years, or sooner if moisture content is 3% or greater. Failure to flush and replace fluid can adversely affect braking, which could result in death or serious injury. (06304b)**

To ensure the brake system is performing to design, check the moisture content of the brake fluid at every service interval or at least annually using a DOT 4 brake fluid moisture tester (part number HD-48497-A or equivalent) following the instructions included with the tool. Flush DOT 4 fluid every 2 years or sooner if the brake system fluid test shows moisture content is 3% or greater.

Harley-Davidson recommends using Harley-Davidson Platinum Label DOT 4 Brake Fluid because of its superior moisture and corrosion inhibiting properties.

## Brake Fluid

### ⚠ WARNING

Clean reservoir filler cap or cover before removing. Use only DOT 4 brake fluid from a sealed container. Contaminated fluid can adversely affect braking, which could result in death or serious injury. (13720a)

### ⚠ WARNING

Contact with DOT 4 brake fluid can have serious health effects. Failure to wear proper skin and eye protection could result in death or serious injury.

- If inhaled: Keep calm, remove to fresh air, seek medical attention.
- If on skin: Remove contaminated clothing. Rinse skin immediately with plenty of water for 15-20 minutes. If irritation develops, seek medical attention.
- If in eyes: Wash affected eyes for at least 15 minutes under running water with eye lids held open. If irritation develops, seek medical attention.
- If swallowed: Rinse mouth and then drink plenty of water. Do not induce vomiting. Contact Poison Control. Immediate medical attention required.
- See Safety Data Sheet (SDS) for more details available at [sds.harley-davidson.com](http://sds.harley-davidson.com)

(00240e)

### NOTICE

DOT 4 brake fluid will damage painted and body panel surfaces it comes in contact with. Always use caution and protect surfaces from spills whenever brake work is performed. Failure to comply can result in cosmetic damage. (00239c)

- If DOT 4 brake fluid contacts painted surfaces, IMMEDIATELY flush area with clear water.

### NOTICE

Do not allow dirt or debris to enter the master cylinder reservoir. Dirt or debris in the reservoir can cause improper operation and equipment damage. (00205c)

### NOTE

- *If the brake system is not leaking, there should never be a need to add fluid. If the fluid level is low, the pads are probably worn. By replacing the pads, the fluid level will return to its normal level.*
- *Use only DOT 4 brake fluid and replace the brake fluid every two years or sooner if moisture content is 3% or greater. See a Harley-Davidson dealer.*

Inspect brake fluid level and check brake pads and discs for wear at proper intervals. Refer to SERVICE INTERVALS AND RECORDS > SERVICE RECORDS (Page 261).

1. Place vehicle on a flat level surface.
  - a. **Front brake:** Level the master cylinder by turning the handlebar and/or standing the motorcycle upright (not leaning on jiffy stand).
  - b. **Rear brake:** Position the motorcycle so the master cylinder reservoir is level.
2. See Figure 78. View reservoir sight glass. Fluid level must be at or above the minimum mark on glass. If fluid level is below minimum mark, see a Harley-Davidson dealer.
3. Verify front brake hand lever and rear brake foot pedal have a firm feel when applied. If brakes are not firm, the brake system must be bled. See a Harley-Davidson dealer.

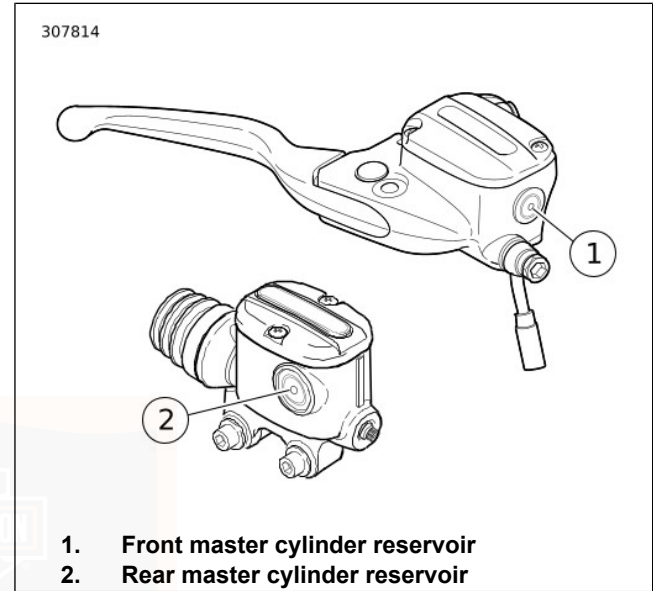


Figure 78. Sight Glass Minimum Marks

AUTHORIZED  
SERVICE

## Brake Pads

### ⚠ WARNING

Inspect brake pads for wear at service maintenance intervals. If you ride under adverse conditions (steep hills, heavy traffic, etc.), inspect more frequently. Excessively worn brake pads can lead to brake failure, which could result in death or serious injury. (00052a)

### ⚠ WARNING

Always replace brake pads in complete sets for correct and safe brake operation. Improper brake operation could result in death or serious injury. (00111a)

### ⚠ WARNING

Brakes are a critical safety component. Contact a Harley-Davidson dealer for brake repair or replacement. Improperly serviced brakes can adversely affect brake performance, which could result in death or serious injury. (00054a)

### ⚠ WARNING

Perform routine scheduled brake maintenance. Lack of maintenance at recommended intervals can adversely affect brake performance, which could result in death or serious injury. (00055a)

### ⚠ WARNING

Be sure wheel and brake caliper are aligned. Riding with a misaligned wheel or brake caliper can cause the brake disc to bind and lead to loss of control, which could result in death or serious injury. (00050a)

Harley-Davidson has provided your new motorcycle with the most optimum brake pad friction material available. It is selected to give the best performance possible under dry, wet and high operating temperature conditions. It exceeds all regulatory requirements currently in effect. However, during some braking conditions you can hear a brake noise. This noise is normal for this friction material.

**Table 47. Minimum Brake Pad Friction Material Thickness**

in	mm
0.016	0.4

1. See Figure 79. Check the brake disc as it spins. The disc should run true in the brake caliper.
2. Measure the thickness of the brake pad friction material. The pads do not necessarily wear evenly. Check each pad. The grooves on the brake pads are no longer visible when the pads are near the end of service life.

3. Replace brake pads before friction material reaches minimum thickness. Always replace brake pads in pairs. See a Harley-Davidson dealer. Refer to Table 47.

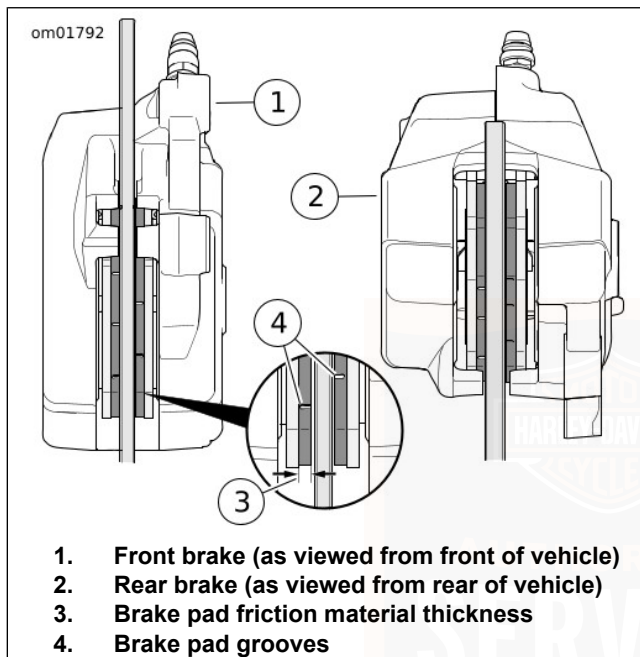


Figure 79. Brake Pad Friction Material

## SHOCK ABSORBERS

Inspect shock absorbers and rubber bushings for leaks and bushing deterioration at proper intervals.

### ⚠ WARNING

**Shock absorber cannot be serviced. Attempting service can cause an explosion, which could result in death or serious injury. (00602d)**

- Do not refill, disassemble, puncture or expose shock to flames.
- Replacement and disposal should only be done by an authorized Harley-Davidson dealer.

## SPARK PLUGS

### ⚠ WARNING

**Disconnecting spark plug cable with engine running can result in electric shock and death or serious injury. (00464b)**

### ⚠ CAUTION

**Do NOT pull on any electrical wires. Pulling on electrical wires may damage the internal conductor causing high resistance, which may result in minor or moderate injury. (00168a)**

### NOTE

*Fuel tank removal improves access to the center spark plug. Refer to the service manual or see a Harley-Davidson dealer for service.*

Check the spark plugs at proper intervals. Refer to SERVICE INTERVALS AND RECORDS > SERVICE RECORDS (Page 261).

1. Disconnect spark plug cables from plugs by pulling up on the molded connector caps.
2. Check spark plug type. Only use spark plugs specified for your model motorcycle.
3. Check spark plug gap against specifications. Refer to Table 20.
4. Always tighten to the proper torque. Spark plugs must be tightened to the torque specified for proper heat transfer. Refer to Table 20.
5. Connect each molded connector cap until the cap snaps firmly into place over the spark plug.

## INSPECTING AIR FILTER

### Removal

#### Standard air cleaner

1. See Figure 80. Remove screw (1) and air cleaner cover (2) with rubber seal (6).
2. Remove three screws (3).
3. Remove filter element (4) pulling breather tube from hole on inboard side.
4. Remove breather tube (5) from breather bolts.
5. Inspect the breather tube and fittings for damage. Replace if necessary.
6. Clean and inspect the filter element. Replace if necessary.

#### Oval air cleaner

1. See Figure 81. Remove air cleaner trim insert.
  - a. Remove trim insert screws (1).

- b. Remove trim insert (2).
2. Remove cover and filter element.
    - a. Remove screws (3).
    - b. Remove cover (4).
    - c. Remove filter element (5).
  3. Clean and inspect the filter element. Replace if necessary.

## Cone Air Cleaner

1. See Figure 82. Remove outer screws (1).
2. Remove inner screw (4).
3. Remove air cleaner cover (3) and air filter element (2).

## Cleaning Filter Element

### NOTE

- *Do not strike filter element on a hard surface to dislodge dirt.*
- *Do not use air cleaner filter oil on the Harley-Davidson paper/wire mesh or synthetic air filter element.*

### ▲ WARNING

**Do not use gasoline or solvents to clean filter element. Flammable cleaning agents can cause an intake system fire, which could result in death or serious injury. (00101a)**

1. Clean filter element.
  - a. Wash the filter element and breather tubes in lukewarm water with a mild detergent.
  - b. **Synthetic element:** Rinse filter element with clean water. The filter element is sufficiently clean when water running from the filter element appears clear.
  - c. Allow filter element to air dry or use low-pressure compressed air from the inside.
  - d. **Paper/wire mesh element:** Hold the filter element up to a strong light source. The element is sufficiently clean when light is uniformly visible through the media.
  - e. Replace the filter element if damaged or if filter media cannot be adequately cleaned.

## Rain Sock

**If equipped with oval air cleaner:** See Figure 81. In wet or rainy conditions, because the filter element is exposed, water can enter the engine. When parked, water can cause internal engine corrosion or damage. When running, water can cause the engine to misfire. In wet or rainy conditions, install the rain sock (6) over the air cleaner assembly to minimize water intrusion.

## Installation

### Standard air cleaner

#### NOTE

*Air cleaner mounting without installation of the breather tubes allows crankcase vapors to vent into the atmosphere. This violates emissions regulations.*

1. See Figure 80. Install breather tube (5) onto breather bolts.
2. Install filter element (4) while pushing breather tube into element.
3. Install screws (3). Tighten screws.

Torque: 5.4–6.8 N·m (48–60 **in-lbs**) *Air cleaner cover bracket screws*

4. Verify that rubber seal (6) is not damaged and is properly seated around perimeter of air cleaner cover.
5. Place air cleaner cover onto backplate. Apply a drop of LOCTITE 243 MEDIUM STRENGTH THREADLOCKER AND SEALANT (blue) to the threads of screw (1). Install screw. Tighten.

Torque: 5.6–7.3 N·m (50–65 **in-lbs**) *Air cleaner cover screw*

### Oval air cleaner

1. See Figure 81. Install cover and filter element.
  - a. Install filter element (5).
  - b. Install cover (4).
  - c. Install screws (3). Tighten.
2. Install air filter trim insert.
  - a. Install trim insert (2).

Torque: 5.7–6.75 N·m (50–60 **in-lbs**) *Air filter cover screws, oval cover*

- b. Install trim insert screws (1). Tighten.

Torque: 3–3.6 N·m (27–32 **in-lbs**) *Air filter trim insert screws*

## Cone Air Cleaner

1. See Figure 82. Apply thread locker to screws (1, 4).

Consumable: LOCTITE 243 MEDIUM STRENGTH THREADLOCKER AND SEALANT (BLUE) (99642-97)

2. Install air filter element (2) and cover (3).

3. Install inner screw (4). Tighten.

Torque: 2–2.7 N·m (17.7–23.9 **in-lbs**) *Air filter cover inner screw*

4. Install outer screws (1). Tighten.

Torque: 2–2.7 N·m (17.7–23.9 **in-lbs**) *Air filter cover outer screw*

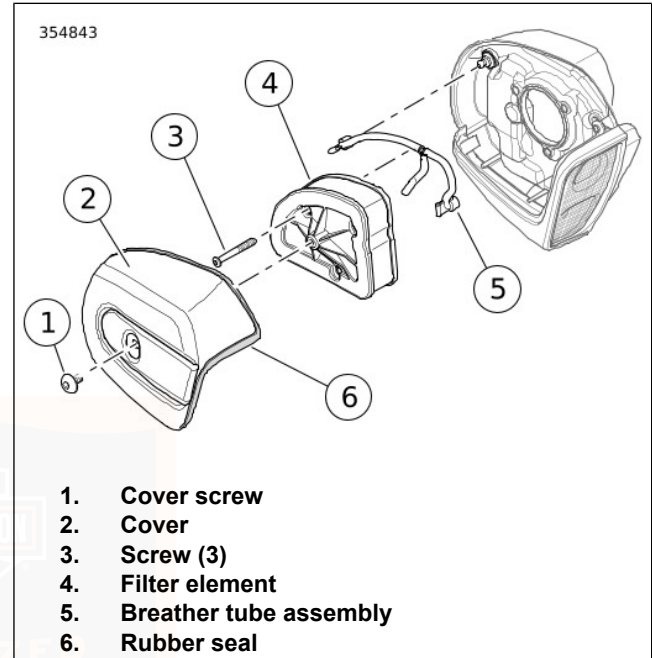


Figure 80. Air Cleaner Assembly (Standard)

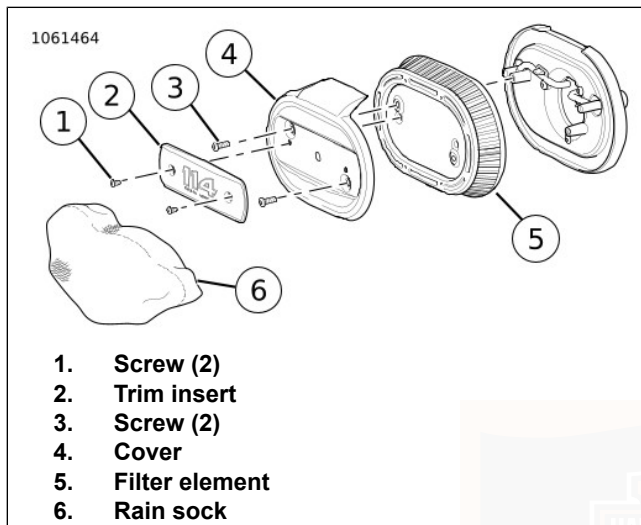


Figure 81. Air Cleaner: Oval

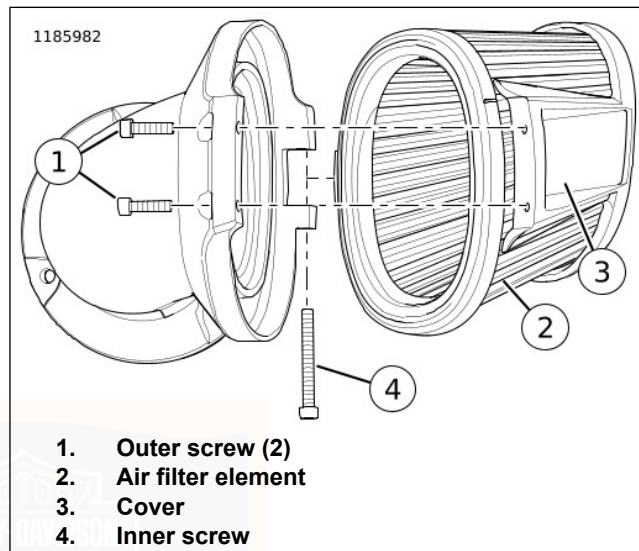


Figure 82. Air Filter: Cone

## SIDE COVERS

See Figure 83. Remove side covers to access fuses and other components.

**Remove:** Remove saddlebag. Pull side cover off.

**Install:** Align barbed studs on side cover with grommets in frame. Push in to secure cover.

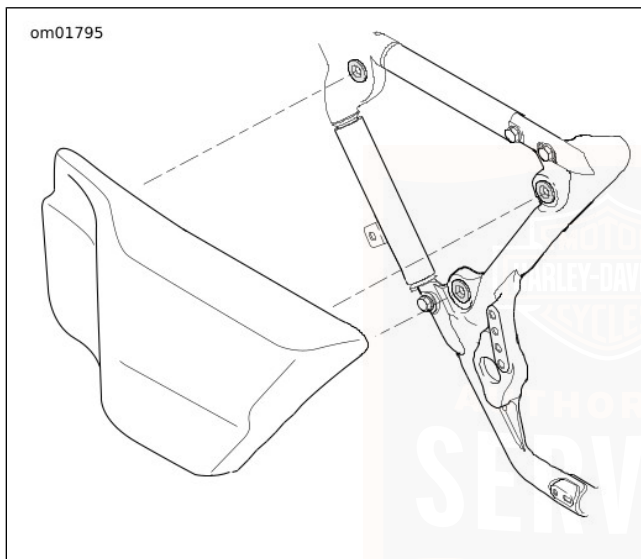


Figure 83. Side Cover

## BATTERY TENDER CONNECTOR

### NOTE

*The main fuse and P&A fuse must both be installed to use a battery tender.*

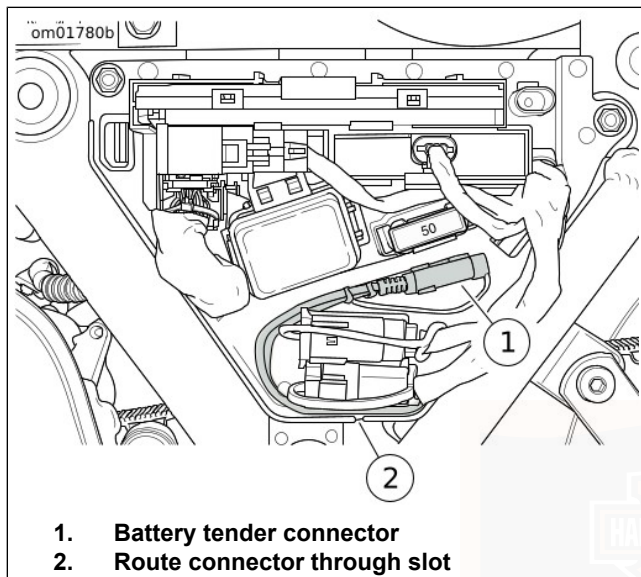
See Figure 84. The motorcycle has a quick disconnect battery tender connector under the left side cover below the main fuse. Connecting a battery tender between rides and during storage can maintain battery charge and extend the life of the battery.

To access connector, remove left side cover. See SERVICE PROCEDURES > SIDE COVERS (Page 195).

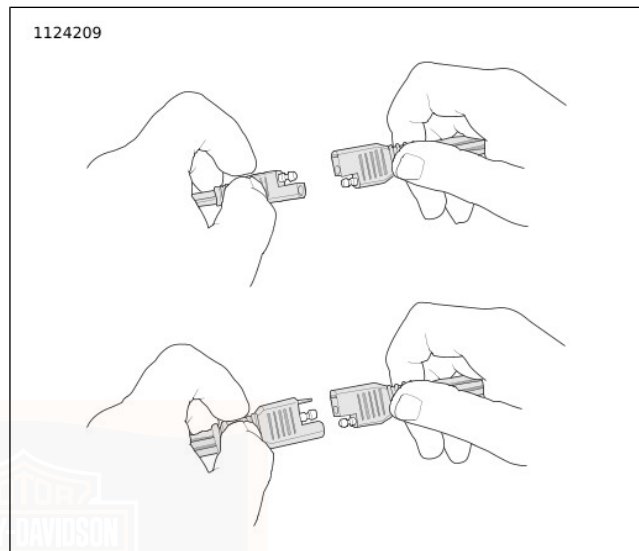
Route the connector through the slot in the bottom of the electrical caddy. Secure the harness and connector with cable straps in a location that prevents damage to the connector and surrounding areas. Make sure to apply ELECTRICAL CONTACT LUBRICANT to the terminals. Keep the connector capped to prevent moisture damage when not in use.

See Figure 85. Connect an automatic, constant monitoring battery charger/tender as shown. The connector is compatible with all Harley-Davidson battery tenders.

For more charging information, see SERVICE PROCEDURES > BATTERY MAINTENANCE (Page 197).



**Figure 84. Battery Tender Connector (under left side cover)**



**Figure 85. Battery Tender Connection**

## BATTERY MAINTENANCE

### Battery Safety

#### ⚠ WARNING

Batteries contain sulfuric acid, which could cause severe burns to eyes and skin. Wear a protective face shield, rubberized gloves and protective clothing when working with batteries. **KEEP BATTERIES AWAY FROM CHILDREN.** (00063a)

#### ⚠ WARNING

Explosive hydrogen gas, which escapes during charging, could cause death or serious injury. Charge battery in a well-ventilated area. Keep open flames, electrical sparks and smoking materials away from battery at all times. **KEEP BATTERIES AWAY FROM CHILDREN.** (00065a)

#### ⚠ WARNING

Batteries, battery posts, terminals and related accessories contain lead and lead compounds, and other chemicals known to the State of California to cause cancer, and birth defects or other reproductive harm. Wash hands after handling. (00019e)

#### ⚠ WARNING

Never remove warning label from battery. Failure to read and understand all precautions contained in warning, could result in death or serious injury. (00064b)

### Absorbed Glass Mat (AGM) Battery Charging Information

The motorcycle has a permanently sealed, maintenance-free Absorbed Glass Mat (AGM) battery design that is superior to conventional flooded lead acid batteries. This battery design will provide many years of dependable service when the proper battery charging equipment and storage procedures are used. Because of the sealed, nonspillable battery design, an automatic, constant monitoring battery charger/tender with a charging rate of 5 amps or less at less than 14.6 volts is recommended to prevent overcharging conditions that will dry out the cells of the battery. Constant current battery chargers (including trickle chargers) are not recommended and can damage AGM batteries. Do not attempt to open the battery for any reason.

A Harley-Davidson constant monitoring battery charger or tender is recommended to maintain a full charge between rides or when your motorcycle will not be ridden for more than two weeks. The best practice is installing the charger/tender any time the motorcycle is not in use. Harley-Davidson offers a variety of fully automatic charger/tenders (North American

and international versions available). These battery charger/tenders include a quick disconnect cable, allowing easy connection to charge the battery without disassembly of the motorcycle.

Lack of regular battery charging or use of constant current battery chargers may void battery warranty.

## Cleaning and Inspecting

Battery top must be clean and dry. Dirt and electrolyte on top of the battery can cause battery to self-discharge.

1. Clean top of battery.
2. Clean cable connectors and battery terminals using a wire brush or fine grit sandpaper to remove any oxidation.
3. Inspect and clean the battery screws, clamps and cables. Check for breakage, loose connections and corrosion.
4. Check the battery posts for melting or damage caused by over-tightening.
5. Inspect the battery for discoloration, a raised top or a warped or distorted case. Any of these conditions indicate that the battery has been frozen, overheated or overcharged.
6. Inspect the battery case for cracks or leaks.

## Charging and Storing the Battery

A battery that is left in the motorcycle can either self-discharge or discharge from parasitic loads. Parasitic loads occur from things like diode leakage and maintaining computer memory. A battery that is removed from the motorcycle can also self-discharge. It is not necessary to remove battery from vehicle for storage.

- Batteries self-discharge at a faster rate at higher ambient temperatures.
- To reduce the self-discharge rate, store battery in a cool, dry place.

An automatic, constant monitoring battery charger/tender with a charging rate of 5 amps or less at less than 14.6 volts is recommended. The use of constant current chargers (including trickle chargers) to charge sealed AGM batteries is not recommended. Any overcharge will cause dry-out and premature battery failure. Never charge a battery without first reviewing the instructions for the charger being used. In addition to the manufacturer's instructions, follow the general safety precautions.

Charge the battery when:

- Motorcycle lights appear dim.
- Electric starter sounds weak.
- Battery has not been used for two weeks or more.

**⚠ WARNING**

**Unplug or turn OFF battery charger before connecting charger cables to battery. Connecting cables with charger ON can cause a spark and battery explosion, which could result in death or serious injury. (00066a)**

*NOTE*

*Make sure that the ignition and all electrical accessories are turned off.*

*Always follow charging instructions supplied with the charger/tender.*

1. With battery in the motorcycle.
  - a. Connect battery charger/tender lead to motorcycle battery tender connector. See SERVICE PROCEDURES > BATTERY TENDER CONNECTOR (Page 195).
  - b. When charging is completed turn OFF the charger. Disconnect the motorcycle battery tender connector.
2. With battery removed from motorcycle.
  - a. Place the battery on a level surface.

- b. Connect battery charger/tender lead to battery connector adapter lead supplied with the battery charger/tender.

**NOTICE**

**Do not reverse the charger connections described in the following steps or the charging system of the motorcycle could be damaged. (00214a)**

- c. Connect the red battery charger lead to the positive terminal of the battery.
- d. Connect the black battery charger lead to the negative terminal of the battery.
- e. Step away from the battery and turn on the charger.

**⚠ WARNING**

**Unplug or turn OFF battery charger before disconnecting charger cables from battery. Disconnecting clamps with charger ON can cause a spark and battery explosion, which could result in death or serious injury. (00067a)**

- f. When charging is completed turn OFF the charger. Disconnect the black battery charger lead. Disconnect the red battery charger lead.

# BATTERY REPLACEMENT

## Disconnection and Removal

1. Remove seat.
  2. See Figure 86. Release ECM (1) from top caddy. Move out of the way.
  3. If present, move purge solenoid (2) up to release from top caddy.
  4. **Models with security system:** Release security antenna (3) from top caddy and move out of the way.
  5. Release connectors (7) from anchors on top caddy.
  6. Remove fasteners (5).
  7. Cut cable straps (4). Move harnesses to allow more clearance for the top caddy.
  8. Push top caddy forward to disengage front of caddy from front hold-down bracket. Remove top caddy.
  9. In order to prevent damage to electrical components, use the following procedure to deactivate the electrical system before disconnecting power.
    - a. Verify that the hands-free fob is present.
    - b. Turn the ignition switch to ON position.
    - c. Remove left side cover.
    - d. Remove the main fuse from its connector.
- ▲ WARNING**
- Disconnect negative (-) battery cable first. If positive (+) cable should contact ground with negative (-) cable connected, the resulting sparks can cause a battery explosion, which could result in death or serious injury. (00049a)**
10. See Figure 87. Disconnect both battery cables, negative battery cable first.
  11. Pull up battery strap to raise battery. When battery is extracted far enough to get a good grip, grasp battery and remove completely.

## Installation and Connection

1. Turn ignition switch OFF.
2. Run battery strap rearward across the bottom of the battery tray, then up and across the frame crossmember.
3. See Figure 87. Place the battery into the battery tray, terminal side forward.

### ⚠ WARNING

**Connect positive (+) battery cable first. If positive (+) cable should contact ground with negative (-) cable connected, the resulting sparks can cause a battery explosion, which could result in death or serious injury. (00068a)**

### NOTICE

**Connect the cables to the correct battery terminals. Failure to do so could result in damage to the motorcycle electrical system. (00215a)**

### NOTICE

**Do not over-tighten bolts on battery terminals. Use recommended torque values. Over-tightening battery terminal bolts could result in damage to battery terminals. (00216a)**

4. Connect both battery cables, positive battery cable first. Tighten.

Torque: 6.8–7.9 N·m (60–70 **in-lbs**) *Battery terminal bolt*

### NOTICE

**Keep battery clean and lightly coat terminals with petroleum jelly to prevent corrosion. Failure to do so could result in damage to battery terminals. (00217a)**

5. Apply a light coat of petroleum jelly or ELECTRICAL CONTACT LUBRICANT to both battery terminals.
6. Fold battery strap forward over top of battery.
7. See Figure 86. Place top caddy into position and engage latch on hold-down bracket.
8. Fasten top caddy to frame crossmember with fasteners (5). Tighten.  
Torque: 8.1–10.9 N·m (72–96 **in-lbs**) *Top caddy screws*
9. Engage security antenna (3) and purge solenoid (2) on top caddy. Verify that all other connectors and harnesses are routed properly.
10. Secure connectors (7) to anchors on top caddy.

11. Latch ECM (1) into place on top caddy.
12. Secure harnesses to frame with cable straps (4).
13. Install seat. After installing seat, pull up on the seat to be sure it is secure.
14. Install main fuse.
15. Install left side cover.

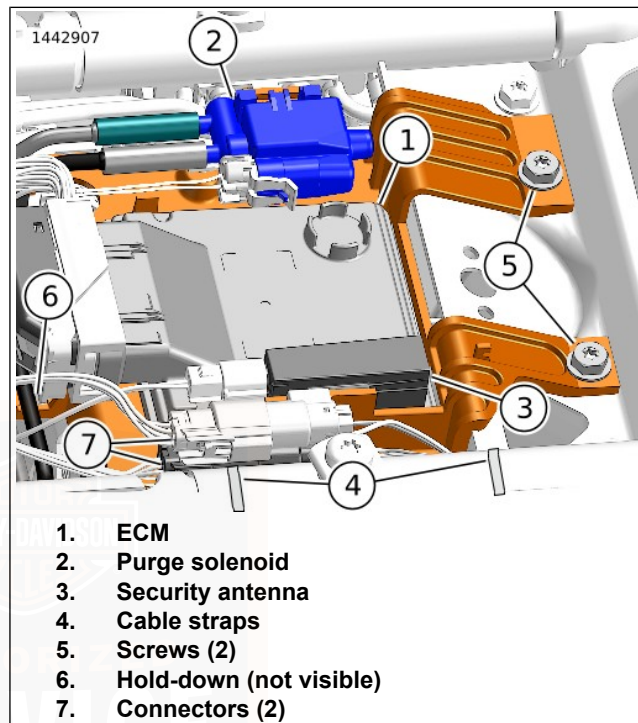


Figure 86. Top Caddy

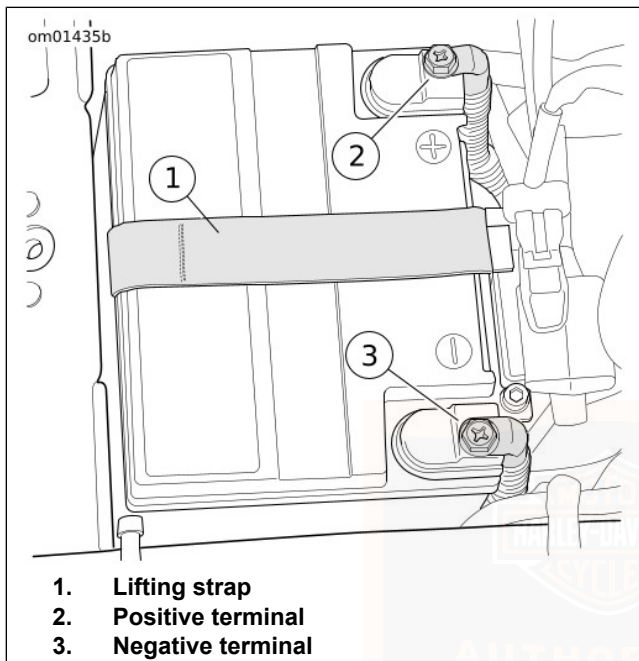


Figure 87. Battery Compartment

## FUSES

### Main Fuse

See Figure 88. A 50 amp main fuse is located near the fuse block. Removing the main fuse disconnects power to all systems except the starter motor/solenoid.

In order to prevent damage to electrical components, use the following procedure to deactivate the electrical system before disconnecting power.

1. Verify that the hands-free fob is present.
2. Turn the ignition switch to ON position.
3. Remove the main fuse from its connector.

#### NOTE

*Place the ignition switch in the OFF position before installing the main fuse.*

### System Fuses

#### NOTICE

**Do not skip any steps for fuse replacement. Skipping fuse replacement steps can result in damage to the sound system and/or other motorcycle systems. (00223a)**

See Figure 88. Fuses are located under left side cover.

If fuse replacement does not correct a problem, see a Harley-Davidson dealer for electrical diagnosis.

1. Turn ignition switch OFF.
2. Remove left side cover. See SERVICE PROCEDURES > SIDE COVERS (Page 195).
3. Press in tabs on the left and right sides of fuse block cover. Remove the cover.
4. See Figure 89. Remove fuse and inspect the element.

**NOTICE**

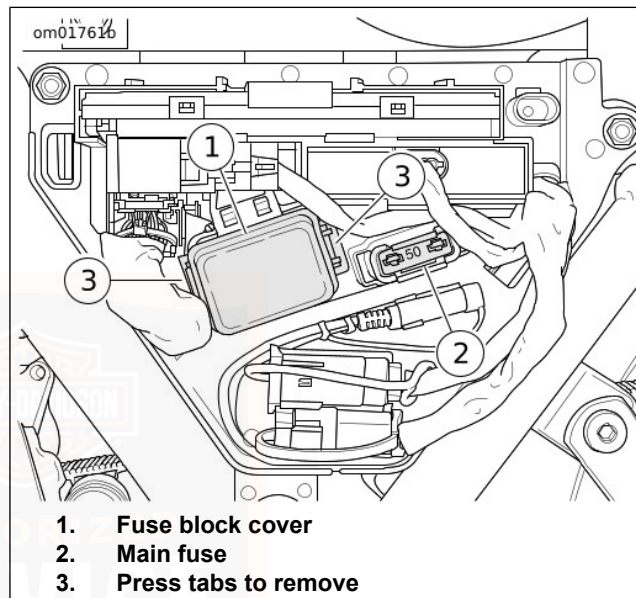
**Always use replacement fuses that are of the correct type and amperage rating. Use of incorrect fuses can result in damage to electrical systems. (00222a)**

5. Replace the fuse if the element is burned or damaged.

**NOTE**

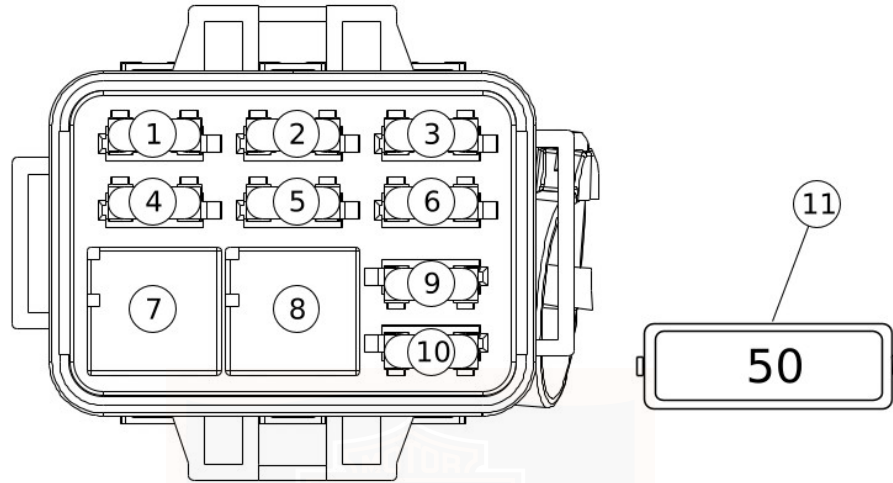
*Use automotive-type fuses for replacements. The fuse block has spare fuses.*

6. Install the fuse block cover.
7. Install left side cover.



**Figure 88. Fuse Block (under left side cover)**

om01841



1. Radio power (30 A)
2. System power (7.5 A)
3. Battery (5 A)
4. P&A (20 A)
5. Cooling (15 A)
6. Spare (5 A)

7. P&A relay
8. Cooling relay
9. Spare (7.5 A)
10. Spare (20 A)
11. Main fuse (50 A)

Figure 89. Fuses and Relays

## CHECK HEADLAMP ALIGNMENT

1. Check tire pressure.
2. Adjust rear shocks for the rider and intended load.
3. Fill fuel tank or add an equal amount of ballast.

### NOTE

*Choose a wall in minimum light.*

4. See Figure 90. Park the motorcycle on a line (1) perpendicular to the wall.
5. Position motorcycle with the front axle 7.6 m (25 ft) from wall.
6. Draw a vertical centerline (2) on the wall aligned with line (1).

### NOTE

*The upper lens is low beam on LED headlamps.*

7. With the motorcycle loaded, point the front wheel straight forward at wall. Measure the distance (4) from the floor to the bulb centerline:
  - a. **Quartz halogen:** Center of **high** beam bulb.
  - b. **LED, fork-mounted fairing:** Center of **low** beam bulb.
  - c. **LED, frame-mounted fairing:** Center of headlamp face.

8. Draw a horizontal line (5) through the vertical line:
  - a. **Quartz halogen:** See Figure 90. 53.3 mm (2.1 in) lower than the measured distance.
  - b. **LED, fork-mounted fairing:** See Figure 91. At the measured distance.
  - c. **LED, frame-mounted fairing:** See Figure 90. 53.3 mm (2.1 in) lower than the measured distance.
9. The headlamp is aligned when the light beam hot spot is located as shown.
  - a. **Quartz halogen:** See Figure 90. Hot spot centered on mark with headlamp set to **high beam**.
  - b. **LED, fork-mounted fairing:** See Figure 91. Top of hot spot at mark with headlamp set to **low beam**.
  - c. **LED, frame-mounted fairing:** See Figure 97. Center of hot spot at mark with headlamp set to **high beam**.

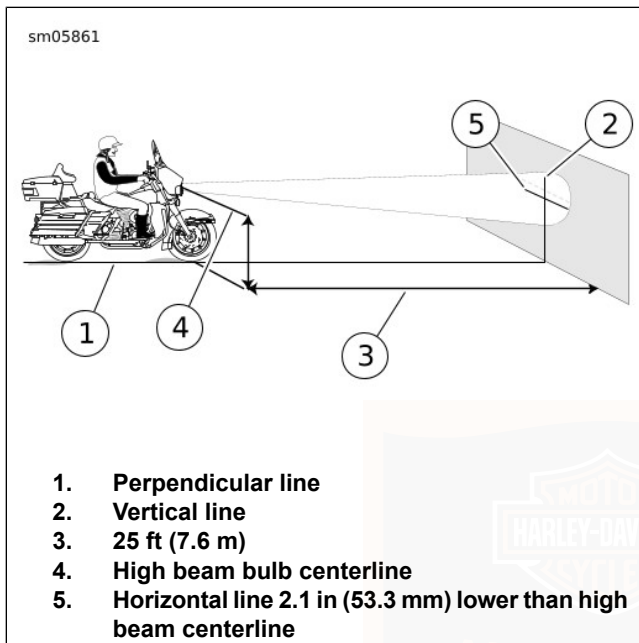


Figure 90. Headlamp Alignment: Quartz Halogen Type

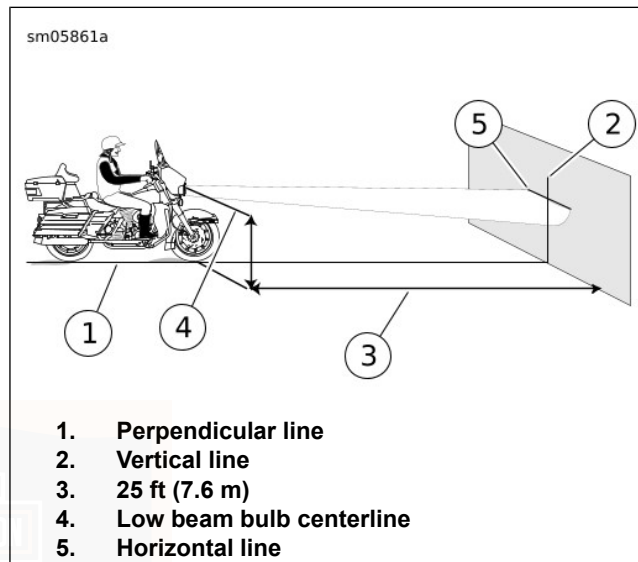


Figure 91. Headlamp Alignment: LED Type (typical)  
**HEADLAMP ALIGNMENT**

*NOTE*

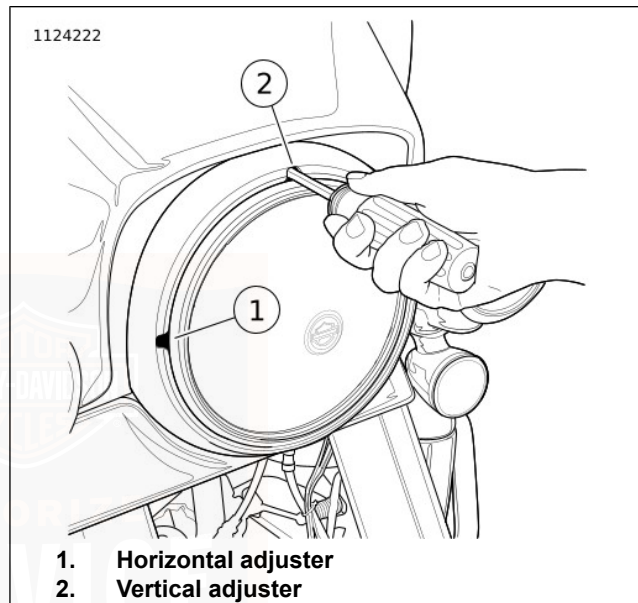
*Do not remove trim ring for headlamp adjustment.*

1. Set headlamp beam:
  - a. **Quartz halogen:** Set headlamp to **high beam**.

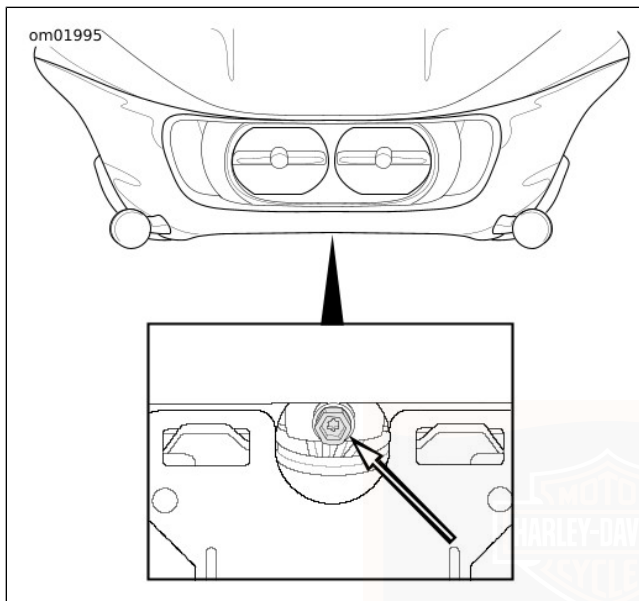
- b. **LED, fork-mounted fairing:** Set headlamp to **low beam**.
  - c. **LED, frame-mounted fairing:** Set headlamp to **high beam**.
2. **All except frame-mounted fairing:** See Figure 92. Insert a 5/32 in ball end hex wrench through adjuster slots in trim ring.
    - a. **Horizontal:** Turn the horizontal adjusting screw (1) to adjust light beam left and right.
    - b. **Vertical:** Turn the vertical adjusting screw (2) to adjust light beam up and down.
    - c. See Figure 95 or Figure 96. Adjust headlamp light beam.

**NOTE**

- *Frame-mounted fairing models allow only vertical adjustment.*
- *Any of three tools can be used: 9 mm socket, 6 mm hex or T15 Torx.*
- *Do not continue turning adjuster past the point resistance is felt.*



**Figure 92. Headlamp Adjusters: All except Frame-Mounted Fairing (typical)**



**Figure 93. Headlamp Adjuster: Frame-Mounted Fairing**  
**HEADLAMP REPLACEMENT**

See Table 48 for models equipped with a replaceable bulb halogen headlamp.

**Table 48. MODELS EQUIPPED WITH HALOGEN HEAD-LAMP**

Electra Glide<sup>®</sup> Standard (FLHT)  
 Road King<sup>®</sup> (FLHR)  
 Road King<sup>®</sup> Special (FLHRXS)  
 Street Glide<sup>®</sup> (FLHX)  
 Street Glide<sup>®</sup> Special (FLHXS)

**Removal**

1. Remove screw at bottom of headlamp door (chrome ring).
2. Rotate door counterclockwise a few degrees. Pull headlamp door straight forward to remove.
3. See Figure 94. Remove screws (1) securing retaining ring.
4. Remove headlamp. Disconnect headlamp connectors.

**Bulb Replacement**

**⚠ WARNING**

**Handle bulb carefully and wear eye protection. Bulb contains gas under pressure, which, if not handled carefully, could cause serious eye injury. (00062b)**

### NOTICE

**When replacement is required, use only the specified sealed beam unit or bulb, available from a Harley-Davidson dealer. An improper wattage sealed beam or bulb, can cause charging system problems. (00209a)**

### NOTE

*This headlamp assembly uses separate quartz halogen bulbs for the low beam and the high beam. HDI models also contain a position lamp bulb.*

1. Remove headlamp assembly.
2. Disconnect wire harness connectors from the bulbs.
3. Rotate bulb assembly 1/4 turn counterclockwise to remove from the reflector/lens.

### NOTICE

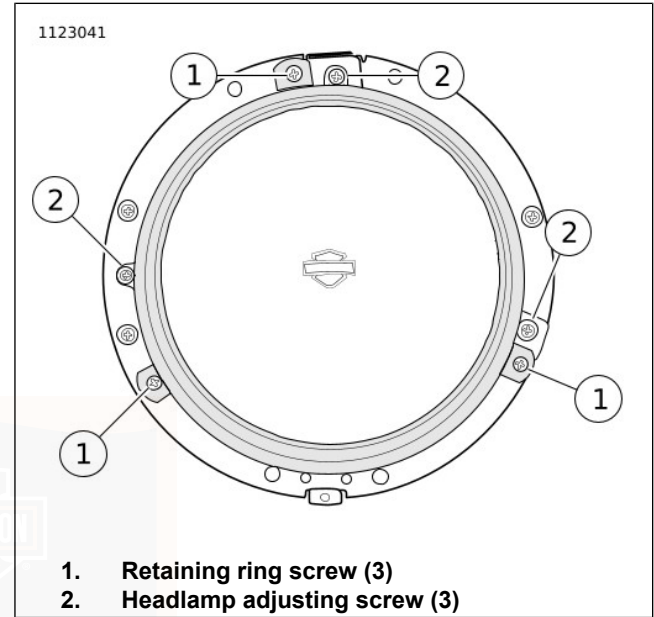
**Never touch the quartz bulb. Fingerprints will etch the glass and decrease bulb life. Handle the bulb with paper or a clean, dry cloth. Failure to do so could result in bulb damage. (00210b)**

4. Insert **new** bulb into reflector/lens and rotate 1/4 turn clockwise.
5. **HDI models:** Rotate position lamp bulb retainer 1/4 turn counterclockwise to remove. Replace bulb and install bulb retainer in lamp housing.
6. Connect the wiring harness connectors to the bulbs.
7. Secure the headlamp assembly and headlamp door.

### Installation

1. Install headlamp connectors.
2. See Figure 94. Secure headlamp assembly with retaining ring and screws (1). Tighten.  
Torque: 2.6–2.9 N·m (23–26 **in-lbs**) *Headlamp retaining ring screws*
3. Install the headlamp door (chrome ring):
  - a. Verify that rubber seal is in place on headlamp door. Apply glass cleaner to seal to ease installation.

- b. With the headlamp door rotated a few degrees counterclockwise, push headlamp door straight onto headlamp.
- c. Rotate clockwise until screw can be installed.
- d. Install screw. Tighten.  
Torque: 1–2 N·m (9–18 **in-lbs**) *Headlamp door screw*



**Figure 94. Headlamp Retaining Ring**  
**ADJUST AUXILIARY/FOG LAMPS**

1. Place the vehicle facing a target wall as described in SERVICE PROCEDURES > CHECK HEADLAMP ALIGNMENT (Page 206).

**NOTE**

*Have a person weighing roughly the same as the principal rider sit on the motorcycle.*

2. With the vehicle upright and a rider seated on the motorcycle, measure the distance from the floor to the centerline of each auxiliary/fog lamp.
3. Measure the horizontal distance from the headlamp vertical centerline to the vertical centerline of each auxiliary/fog lamp.
4. See Figure 95 or Figure 96. Mark the auxiliary/fog lamp horizontal and vertical centerlines (2, 3) on the wall.
5. Remove the turn signal lamp from the mounting bracket.
6. Using special tool, loosen the auxiliary/fog lamp flange nut only enough to allow movement of the lamp.  
Special Tool: FLARE NUT SOCKET (FRX181)
7. Turn on the headlamp low beam and cover both the headlamp and the right auxiliary/fog lamp.

**NOTE**

*Figure 95 shows a pattern for motorcycles in countries that drive in the right lane. Flip the graphic horizontally for countries that drive in the left lane.*

- a. **Quartz halogen:** Adjust the left auxiliary/fog lamp so the entire high intensity zone (4) is below and to the right of the left auxiliary/fog lamp centerlines as shown in Figure 95.
  - b. **LED:** Adjust the left auxiliary/fog lamp so the entire high intensity zone (4) is below the centerline as shown in Figure 96.
8. Repeat procedure with right lamp.
  9. Tighten auxiliary/fog lamp nut:
    - a. **Models with flat lens turn signal lamps:**  
20.3–24.4 N·m (15–18 ft-lbs).
    - b. **Models with bullet style turn signal lamps:**  
27.1–32.5 N·m (20–24 ft-lbs).

10. Install turn signal:

- a. **Models with flat lens turn signal lamps:** Start two screws to secure turn signal lamp to mounting bracket. Verify that conduit fits in slot at back of bracket and is not pinched. Tighten to 4.1–6.8 N·m (36–60 in-lbs).
- b. **Models with bullet style turn signal lamps:** Secure turn signal lamp to mounting bracket. Tighten to 10.9–13.5 N·m (96–120 in-lbs).

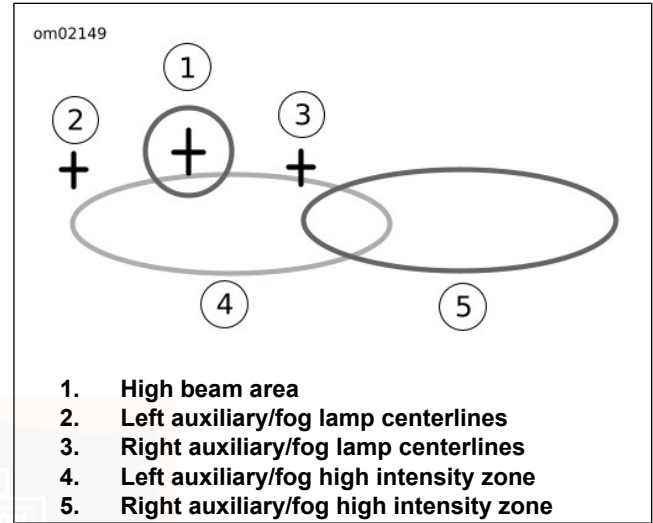
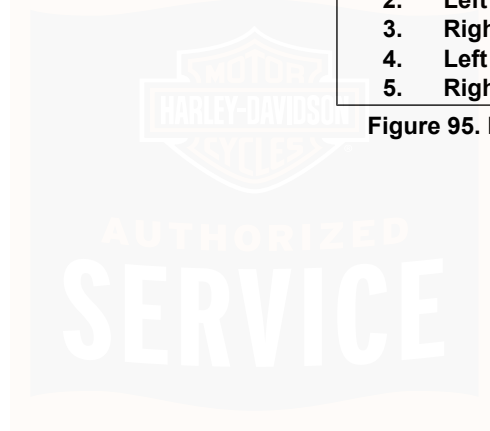
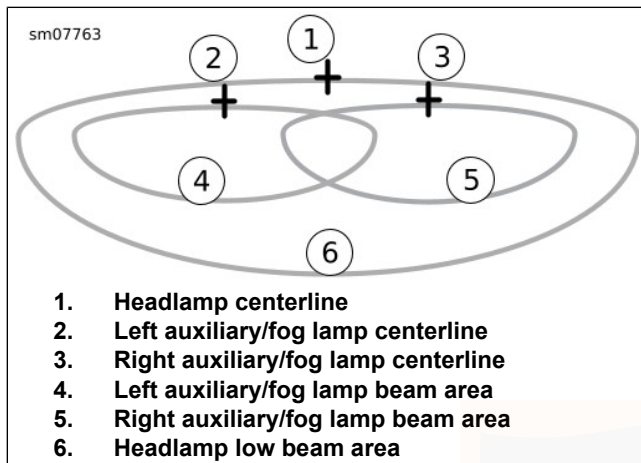
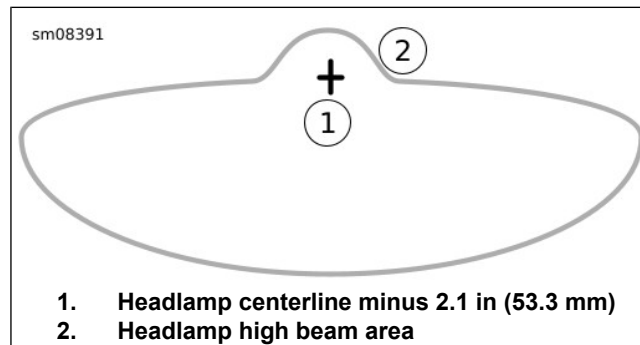


Figure 95. Headlamp Pattern: Quartz Halogen Type





**Figure 96. Headlamp Pattern: LED Type with Auxiliary/Fog Lamps**



**Figure 97. Headlamp Pattern: Frame-Mounted Fairing Models**

## **TAIL LAMP BULB REPLACEMENT: INCANDESCENT**

### **Removal**

1. Remove two screws to release tail lamp assembly from chrome base.
2. See Figure 98. Disconnect tail lamp connector (3).
3. Rotate bulb socket (4) a quarter turn counterclockwise and remove from tail lamp assembly. Remove bulb.

## Installation

1. Coat base of **new** bulb with ELECTRICAL CONTACT LUBRICANT. Install **new** bulb.
2. See Figure 98. Insert socket (4) into tail lamp assembly. Rotate a quarter turn clockwise.
3. Attach tail lamp connector (3).
4. Place tail lamp into position against chrome base.

### NOTE

*Do not over-tighten screws.*

5. Install two screws. Tighten to 2.3–2.7 N·m (20–24 in-lbs).

### **▲ WARNING**

**Be sure that all lights and switches operate properly before operating motorcycle. Low visibility of rider can result in death or serious injury. (00316a)**

6. Check operation of all lamps.

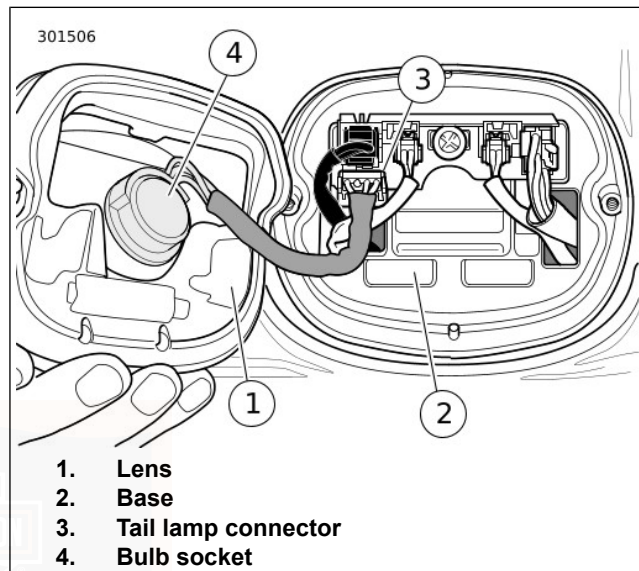


Figure 98. Tail Lamp Assembly

## TURN SIGNAL BULB REPLACEMENT: LED

The Light Emitting Diode (LED) turn signal lamp is a sealed assembly. Replace the turn signal lamp as a unit. See a Harley-Davidson dealer.

## TURN SIGNAL BULB REPLACEMENT: BULLET STYLE

### NOTE

*Models with LED lamps do not contain replacement bulbs. Replace the LED assembly.*

1. See Figure 99. Insert a coin or the blade of a small screwdriver into the notch at the bottom of the lens cap. Carefully twist until the lens cap pops out of the lamp housing.
2. Push bulb in and rotate counterclockwise. Pull bulb from socket.
3. Inspect condition of electrical contacts in socket. If necessary, clean with a small wire brush and electrical contact cleaner.
4. Apply ELECTRICAL CONTACT LUBRICANT to contacts in socket and at bottom of **new** bulb.
5. Align pins on **new** bulb with pin guides in bulb socket. Push bulb in and turn clockwise to lock in place.
6. Snap lens cap onto the lamp housing with notch at bottom.

### ▲ WARNING

**Be sure that all lights and switches operate properly before operating motorcycle. Low visibility of rider can result in death or serious injury. (00316a)**

7. Check operation of all lamps.



**Figure 99. Lens Cap Notch**

## TURN SIGNAL BULB REPLACEMENT: FLAT LENS STYLE

1. See Figure 100. Remove two screws (1) to release lens (2) from lamp housing (4).
2. While pushing bulb (3) in, rotate counterclockwise to remove.
3. Inspect condition of electrical contacts in socket. If necessary, clean with a small wire brush and electrical contact cleaner.
4. Apply ELECTRICAL CONTACT LUBRICANT to contacts in socket and at bottom of **new** bulb.
5. Align pins on **new** bulb with guides in bulb socket. Push and rotate new bulb clockwise into socket.
6. Secure lens (2) to lamp housing (4) with two screws (1).

### **⚠ WARNING**

**Be sure that all lights and switches operate properly before operating motorcycle. Low visibility of rider can result in death or serious injury. (00316a)**

7. Check operation of all lamps.

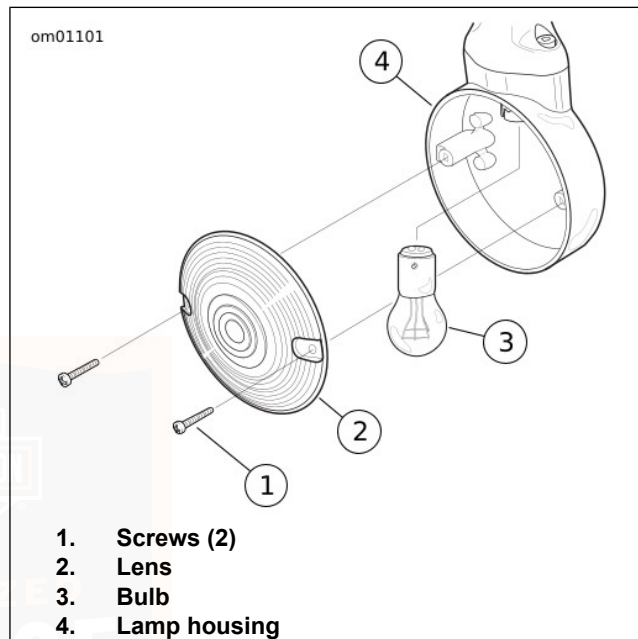


Figure 100. Turn Signal Lamp Assembly: Flat Lens Style

# SEAT

## Removal

### Solo Seat

1. See Figure 101 and Figure 102. Remove seat.
  - a. **Hidden seat nuts:** Lift up the flap and foam covering the mounting nuts on the rear of the seat.
  - b. Remove seat nuts (1).
  - c. See Figure 104 and Figure 105. Raise rear of seat. Pull seat rearward to disengage the tongue from the slot in the seat.

### Two-Up One-Piece Seat

#### NOTE

*The seat screw may be difficult to access if the Tour-Pak is in the forward position. If necessary, see OPERATION > TOUR-PAK (Page 145) to temporarily move the Tour-Pak.*

1. Open Tour-Pak lid.
2. Open one of the saddlebag lids.

3. See Figure 103. Remove screw to release seat strap from bracket.
4. Remove screw to release seat from top of rear fender.

#### NOTE

*Cover the seat mount mounting bracket with palm of hand to prevent damage to Tour-Pak.*

5. See Figure 104 and Figure 105. Raise rear of seat. Pull seat rearward to disengage the tongue from the slot in the seat.

## Installation

### Solo Seat

1. See Figure 101. Install seat.
  - a. See Figure 104 and Figure 105. Align seat slot with tongue behind the fuel tank. Push seat forward to engage seat.
  - b. Install seat nuts (1). Tighten.  
Torque: 0.9–1.7 N·m (0.7–1.3 ft-lbs) *Seat nut*
2. Pull up on seat to verify that it is secure.

3. **Hidden seat nuts:** Lower seat foam and flap down over seat nuts.

### Two-Up One-Piece Seat

#### NOTE

Cover the seat mount mounting bracket with palm of hand to prevent damage to Tour-Pak.

1. See Figure 104 and Figure 105. Align seat slot with tongue behind the fuel tank. Push seat forward to engage seat.
2. See Figure 103. Secure seat bracket to rear fender with screw. Tighten.  
Torque: 5.4–8.1 N·m (48–72 in-lbs) *Seat bracket screw*
3. Pull up on seat to check that it is properly secured.
4. See Figure 103. Insert strap in slot on seat strap bracket.
5. Install screw and washer. Tighten.  
Torque: 5.4–8.1 N·m (48–72 in-lbs) *Seat strap bracket*
6. Close the saddlebag lid.
7. Close Tour-Pak lid.

#### NOTE

Install Tour-Pak back in desired position if removed. See OPERATION > TOUR-PAK (Page 145).

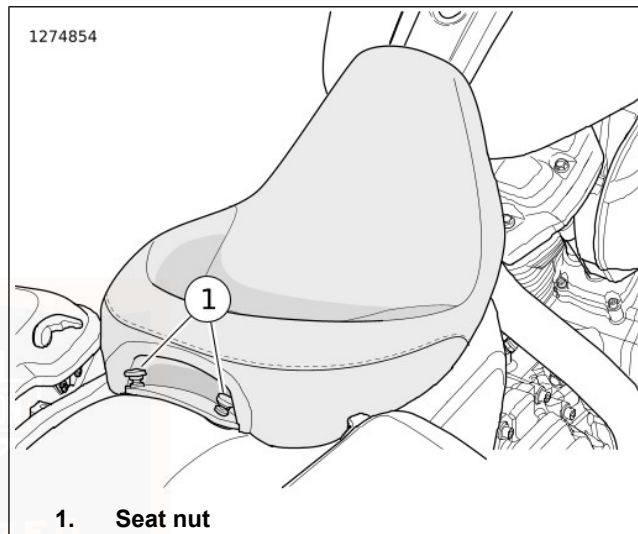
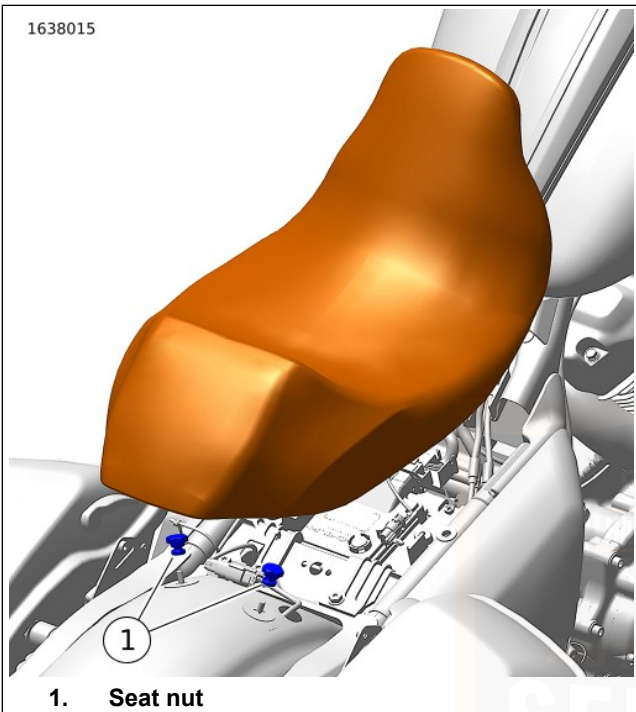


Figure 101. Solo Seat: FLHT

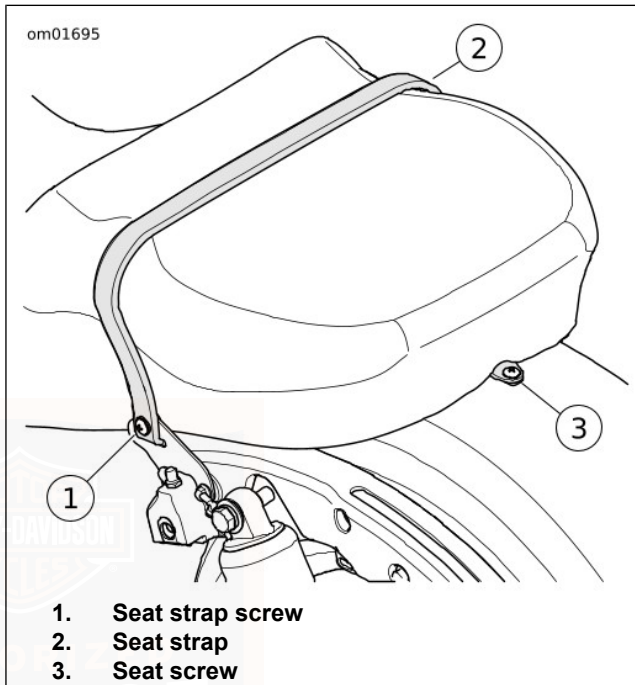
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1. Seat nut

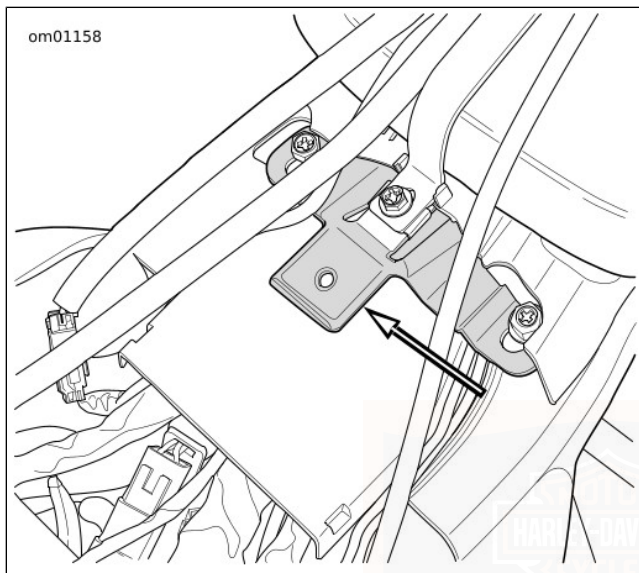
Figure 102. Solo Seat: Hidden Seat Nuts

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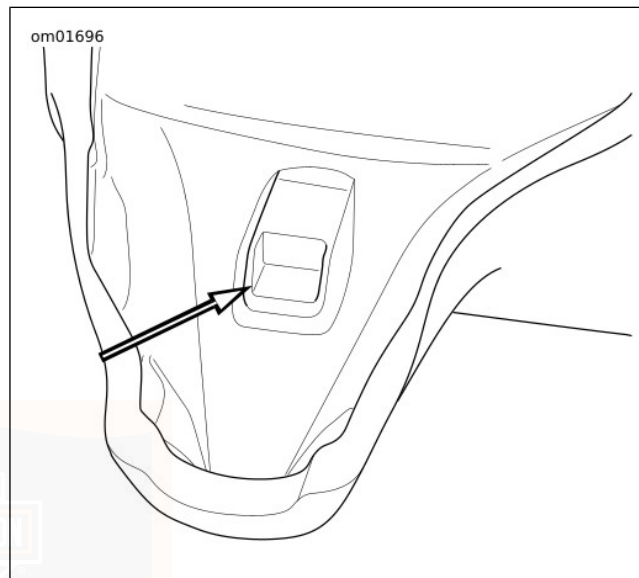


1. Seat strap screw
2. Seat strap
3. Seat screw

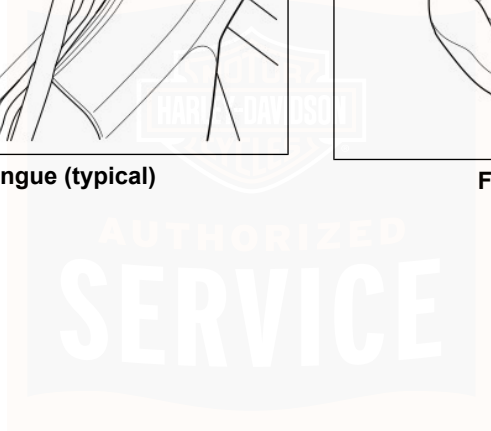
Figure 103. Seat Strap Screw



**Figure 104. Seat Tongue (typical)**



**Figure 105. Seat Mounting Slot**



# NOTES

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## TROUBLESHOOTING: GENERAL

### ⚠ WARNING

The troubleshooting section of the Owner's Manual is a guide to diagnose problems. Read the service manual before performing any work. Improper repair and/or maintenance could result in death or serious injury. (00080a)

Use the following checklists for troubleshooting. Carefully check each cause because more than one condition can cause trouble.

## ENGINE

### Starter Does Not Operate or Does Not Turn Engine Over

1. Engine OFF/RUN switch off.
2. Ignition switch off.
3. Discharged battery or loose or corroded connections (solenoid chatters).
4. Clutch lever not squeezed against handlebar or transmission not in neutral.
5. Jiffy stand not in retracted position (for models equipped with jiffy stand interlock).

6. Blown fuse.

### Engine Turns Over But Does Not Start

1. Fuel tank empty.
2. Fuel filter clogged.
3. Discharged battery or loose or damaged battery terminal connections.
4. Fouled spark plugs.
5. Spark plug cable connections loose or in bad condition and shorting.
6. Loose or corroded wire or cable connection at coil or battery.
7. Fuel pump inoperative.
8. Blown fuse.

### Starts Hard

1. Spark plugs in bad condition, have improper gap or are partially fouled.
2. Spark plug cables in bad condition and leaking.
3. Battery nearly discharged.
4. Loose wire or cable connection at one of the battery terminals or at coil.

5. Engine oil too heavy (cold weather).
6. Fuel tank vent plugged or fuel line closed off, restricting fuel flow.
7. Water or dirt in fuel system or filter.
8. Fuel pump inoperative.

### **Starts But Runs Irregularly or Misses**

1. Spark plugs in bad condition or partially fouled.
2. Spark plug cables in bad condition and leaking.
3. Spark plug gap too close or too wide.
4. Battery nearly discharged.
5. Damaged wire or loose connection at battery terminals or coils.
6. Intermittent short circuit due to damaged wire insulation.
7. Water or dirt in fuel system or filter.
8. Fuel vent system plugged. See dealer.
9. One or more injectors fouled.

### **A Spark Plug Fouls Repeatedly**

1. Fuel mixture too rich.
2. Incorrect spark plug for service

### **Pre-ignition or Detonation (Knocks or Pings)**

1. Incorrect fuel.
2. Incorrect spark plug for service

### **Overheats**

1. Insufficient oil supply or oil not circulating.
2. Heavy carbon deposit from lugging engine. See dealer.
3. Insufficient air flow over cylinder heads during extended periods of idling or parade duty.

### **Excessive Vibration**

1. Rear fork pivot shaft loose. See dealer.
2. Front engine mounting bolts loose. See dealer.
3. Front chain or links tight as a result of insufficient lubrication or belt badly worn.
4. Engine to transmission mounting bolts loose (applicable models). See dealer.
5. Damaged frame. See dealer.
6. Wheels and/or tires damaged. See dealer.
7. Vehicle not properly aligned. See dealer.

## **Engine Oil Not Circulating (Oil Pressure Lamp Lit)**

1. Insufficient or diluted oil supply.
2. Oil feed clogged with ice and sludge in freezing weather.
3. Grounded oil signal switch wire or faulty signal switch. See dealer.
4. Damaged or improperly installed check valve. See dealer.
5. Oil pump problem. See dealer.

## **ELECTRICAL SYSTEM**

### **Alternator Does Not Charge**

1. Regulator not grounded. See dealer.
2. Engine ground wire loose or damaged. See dealer.
3. Loose or damaged wires in charging circuit. See dealer.

### **Alternator Charge Rate is Below Normal**

1. Weak battery.
2. Excessive use of add-on accessories.
3. Loose or corroded connections.
4. Extensive periods of idling or low speed riding.

## **TRANSMISSION**

### **Transmission Shifts Hard**

1. Clutch controls improperly adjusted. See dealer.
2. Bent shifter rod. See dealer.

### **Transmission Jumps Out of Gear**

1. Worn shifter dogs in transmission. See dealer.

### **Clutch Slips**

1. Clutch controls improperly adjusted. See dealer.
2. Worn friction discs. See dealer.
3. Insufficient clutch spring tension. See dealer.

### **Clutch Drags or Does Not Release**

1. Clutch controls improperly adjusted. See dealer.
2. Primary chaincase overfilled.
3. Clutch discs warped. See dealer.

### **Clutch Chatters**

1. Friction discs or steel discs worn or warped. See dealer.

## **BRAKES**

### **ABS System Behavior**

1. Anti-lock Braking System (ABS) lamp does not shut off above 5 km/h (3 mph). See dealer.
2. Other ABS symptoms. Refer to Table 35.

### **Brakes Do Not Hold Normally**

1. Master cylinder low on fluid. See dealer.
2. Brake line contains air bubbles. See dealer.
3. Master cylinder or caliper piston worn. See dealer.
4. Brake pads contaminated with grease or oil. See dealer.
5. Brake pads badly worn. See dealer.
6. Brake disc badly worn or warped. See dealer.
7. Brake fades because of heat build up. Excessive braking or brake pads dragging. See dealer.
8. Brake drags. Insufficient hand lever free play. See dealer.

## **COOLING SYSTEM: TWIN-COOLED MODELS**

### **Overheats**

1. Low coolant level.

2. Restricted radiator air flow.
3. Coolant pump or fans inoperative. See dealer.
4. Vent hose crimped.
5. Air in coolant.

## **HANDLING**

1. Improperly loaded motorcycle. Non-standard equipment such as heavy radio receivers, extra lighting equipment excess or unsecured luggage may cause unstable handling.
2. Load (rider, passenger and gear) exceeds maximum GVWR.
3. Damaged tires or improper front-rear tire combination. See dealer.
4. Incorrect, non-specified tire mounted on front or rear wheel. See dealer.
5. Incorrect tire pressure.
6. Irregular or peaked front tire tread wear. See dealer.
7. Tire and wheel unbalanced. See dealer.
8. Shock absorber not functioning normally. See dealer.
9. Incorrect suspension adjustment.

10. Loose wheel axle nuts. Tighten to recommended torque specification. See dealer.
11. Excessive wheel bearing play. See dealer.
12. Swing-back (steering head bearing adjustment) out-of-specification. Adjust and replace pitted or worn bearings and races. See dealer.
13. Rear fork pivot assembly improperly tightened or assembled, or loose/pitted or damaged pivot bearings. See dealer.

14. Engine mounts and/or stabilizer links loose, worn or damaged. See dealer.

## **HEATED HAND GRIPS**

1. Engine must be running. Start engine.
2. Check fuse.
3. See dealer.



# NOTES

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## WARRANTY AND MAINTENANCE

This owner's manual contains your new motorcycle limited warranty and your owner's maintenance record.

It is your responsibility as the owner to follow the maintenance schedule at the mileage intervals as specified in the owner's manual. All of the specified maintenance services must be performed on schedule to keep your limited warranty valid.

Some countries, states or other locations may require all regular maintenance and service work to be done by an authorized Harley-Davidson dealer for your limited warranty to remain in effect. Check with your authorized Harley-Davidson dealer for local requirements.

1. Make an appointment with a Harley-Davidson dealer for inspection and service prior to the first 1,600 km (1000 mi), and as soon as possible after any issue arises.
2. Bring this owner's manual with you when you visit your authorized Harley-Davidson dealer to have your motorcycle inspected and serviced.
3. Have the dealer technician sign the maintenance record in the owner's manual at the proper mileage interval. These records should be retained by the owner as proof of proper maintenance.
4. Keep receipts covering any parts, service or maintenance performed.

These records should be transferred to each subsequent owner.

Use only Harley-Davidson approved parts and accessories that have been designed, tested and approved for your model and model year motorcycle.

Use of aftermarket performance parts may void all or parts of your limited warranty. See an authorized Harley-Davidson dealer for details.

Harley-Davidson authorized dealerships are independently owned and operated and may sell and install parts and accessories that are not manufactured or approved by Harley-Davidson for use on your motorcycle. Therefore, you should understand that Harley-Davidson is not and cannot be responsible for the quality, suitability, or safety of any non-Harley-Davidson part, accessory or design modification, including labor, which may be sold and/or installed by authorized Harley-Davidson dealerships.

### KEEPING IT ALL HARLEY-DAVIDSON

Genuine Harley-Davidson parts are engineered and tested specifically for use on your motorcycle. Insist that your authorized Harley-Davidson dealer uses only genuine Harley-Davidson replacement parts and accessories to keep your Harley-Davidson motorcycle and its limited warranty intact. Not all Harley-Davidson parts and accessories are appropriate for your model or model year motorcycle.

## NOTICE

It is possible to overload the vehicle's charging system by adding too many electrical accessories. If the combined electrical accessories operating at any one time consume more electrical current than the vehicle's charging system can produce, the electrical consumption can discharge the battery and cause damage to the vehicle's electrical system. (00211d)

### NOTE

*Installing off-road or competition parts to enhance performance may void all or parts of your limited warranty. See the Harley-Davidson Motorcycle Limited Warranty in this owner's manual or an authorized Harley-Davidson dealer for details.*

## CALIFORNIA AND SELECT INTERNATIONAL MARKETS EVAPORATIVE EMISSION CONTROLS

All new Harley-Davidson motorcycles sold in the State of California and select international markets have an evaporative emission control system. This system is designed to meet CARB and local regulations in effect at the time of manufacture.

The system requires a small amount of maintenance. Periodically inspect system to verify that hoses are properly routed, not kinked or blocked and that all fittings are secure. Periodically check mounting hardware for tightness.

230 Warranties and Responsibilities

## EPA NOISE REGULATIONS IN THE UNITED STATES

EPA noise regulations require that the following statements be included in the Owner's Manual.

### EPA Regulations

**Tampering with noise control / exhaust emissions control system prohibited:** Federal law prohibits the following acts or the causing thereof: (1) The removal or rendering inoperative by any person other than for purposes of maintenance, repair, or replacement of any device or element of design incorporated into any new vehicle for the purpose of noise control prior to its sale or delivery to the ultimate purchaser or while it is in use, or (2) the use of the vehicle after such device or element of design has been removed or rendered inoperative by any person.

Among those acts presumed to constitute tampering are the following:

1. Replacing the muffler(s) and/or the entire exhaust system with parts not certified to be noise legal for street use.
2. Removing or modifying the muffler internal baffles in any way.
3. Replacing the air intake/cleaner assembly with one not certified to be noise legal for street use.

4. Modifying the air intake/cleaner assembly in such a way as to make the vehicle no longer noise legal for street use.

Harley-Davidson recommends that any and all noise related maintenance be done by an authorized Harley-Davidson dealer using Genuine Harley-Davidson® parts.

## WARRANTY/SERVICE INFORMATION

Any authorized Harley-Davidson dealer may provide warranty repair work on your motorcycle. The fact that an authorized Harley-Davidson dealership performs warranty repairs does not create an agency relationship between Harley-Davidson and the authorized dealership. If you have any questions regarding warranty obligations contact your authorized Harley-Davidson dealer.

For normal service work or warranty work under the above conditions, you may obtain the name and location of your nearest U.S. authorized Harley-Davidson dealer by calling 1-800-258-2464 (U.S. only). To find dealers worldwide, see [www.harley-davidson.com](http://www.harley-davidson.com).

## REPORTING SAFETY DEFECTS IN THE UNITED STATES

Safety defects must be reported to the National Highway Traffic Safety Administration (NHTSA) and Harley-Davidson.

## NHTSA Statement

If you believe that your motorcycle has a defect which could cause a crash or could cause injury or death, you should immediately inform the National Highway Traffic Safety Administration (NHTSA) in addition to notifying Harley-Davidson.

If NHTSA receives similar complaints, it may open an investigation, and if it finds that a safety defect exists in a group of motorcycles, it may order a recall and remedy campaign. However, NHTSA cannot become involved in individual problems between you, your authorized Harley-Davidson dealer, or Harley-Davidson.

You can contact NHTSA through the following means. Additional information about motor vehicle safety is available through the website.

**Telephone:** Vehicle Safety Hotline (toll-free) at 1-888-327-4236 (TTY: 1-800-424-9153).

**Website:** [www.safercar.gov](http://www.safercar.gov)

**Address:** Administrator, NHTSA, 400 Seventh Street SW, Washington, DC 20590

## **REQUIRED DOCUMENTATION FOR IMPORTED MOTORCYCLES**

If a Harley-Davidson motorcycle is imported into the United States, additional documentation is required for that motorcycle to be eligible for the United States Harley-Davidson Motorcycle Limited Warranty. An authorized Harley-Davidson dealer can provide a form explaining the requirements.

## **OWNER CONTACT INFORMATION**

If you move from your present address, sell your motorcycle, or purchase a pre-owned Harley-Davidson motorcycle, see an authorized Harley-Davidson dealer to update your owner contact information.

This will provide Harley-Davidson with an accurate registration (as required by law in some countries), and will allow Harley-Davidson to notify you in the event of a recall or product program.

The rights and benefits conferred upon you and the obligations of Harley-Davidson as set forth herein are separate and distinct from any rights and duties set forth in any service contract you may have purchased from a dealership and/or third-party insurance company. Harley-Davidson does not authorize any entity to expand Harley-Davidson's warranty obligations in connection with your motorcycle or this limited warranty.

When updating your contact information, your authorized Harley-Davidson dealer will need your Vehicle Identification Number (VIN), odometer mileage, and date of vehicle transfer (if applicable).

## **QUESTIONS AND CONCERNS**

If you have questions or concerns regarding the performance of your motorcycle or the application of the limited warranty described here, or are not satisfied with the service you are receiving from an authorized Harley-Davidson dealership, do the following:

1. Contact the selling and/or servicing dealership and speak to the sales and/or service manager.
2. If your concern cannot be addressed to your satisfaction by the dealership, contact the Harley-Davidson Customer Support Center by mailing your concern to the following address or calling the phone number below.

In the U.S., state warranty laws, often referred to as lemon laws, may provide you with certain rights not specifically mentioned here. To the extent allowed by your state, Harley-Davidson requests that you first send written notification of any defect or warranty non-conformity that you have experienced with your motorcycle to Harley-Davidson. Harley-Davidson appreciates the opportunity to investigate your concerns and restore your satisfaction in your motorcycle by making the necessary repairs consistent with the terms of

Harley-Davidson's limited warranty. Harley-Davidson requests that you send your complaint to the Harley-Davidson Customer Support Center.

- Harley-Davidson Motor Company Attention:  
Harley-Davidson Customer Support Center P.O. Box 653  
Milwaukee, Wisconsin 53201 1-800-258-2464 (U.S. only)  
1-414-343-4056

This warranty does not mean that each Harley-Davidson motorcycle is free from defects. Defects may be unintentionally introduced into motorcycles during the design and manufacturing processes and such defects could result in the

need for repairs. For this reason, Harley-Davidson provides the Limited Warranty in order to remedy any such defects that result in a component malfunction or failure during the warranty period. The remedy under this written warranty, and any implied warranty, is limited to repair, replacement or adjustment of the defective part. This exclusive remedy shall not be deemed to have failed its essential purpose so long as Harley-Davidson, through its authorized dealers, is willing and able to repair, replace or adjust defective parts in the prescribed manner. Harley-Davidson's liability, if any, shall in no event exceed the cost of correcting any defect as herein provided and upon expiration of this warranty, any such liability shall terminate.



# NOTES

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## 2022 HARLEY-DAVIDSON LIMITED MOTORCYCLE WARRANTY

APPLICABILITY	
<input type="checkbox"/>	• BRZ

### 24 Months/Unlimited Miles

Harley-Davidson warrants for any new 2022 Harley-Davidson® motorcycle that an authorized Harley-Davidson dealer will repair or replace without charge any parts found on your motorcycle that malfunction or fail during normal use during the applicable coverage period due to an issue with factory supplied materials or factory workmanship. Such repair or replacement of failed parts will be Harley-Davidson's sole obligation and your sole and exclusive remedy under this limited warranty. This limited warranty applies only for the duration identified below.

No person, including Harley-Davidson dealers, may modify, extend or waive any part of this warranty. As a condition of this warranty, you are responsible for properly using, maintaining, and caring for your motorcycle as outlined in your Owner's Manual. Harley-Davidson recommends that you maintain copies of all maintenance records and receipts.

THERE IS NO OTHER EXPRESS WARRANTY (OTHER THAN THE SEPARATE EMISSIONS, NOISE AND RADIO

LIMITED WARRANTIES) ON THE MOTORCYCLE. Any implied warranty of merchantability or fitness for particular purpose is limited to the duration of the express warranty, or to the duration set forth in your state's warranty statutes, whichever is shorter. Any implied warranty is not transferred to subsequent purchasers/buyers of the motorcycle.

The implied warranty of fitness for a particular purpose does not apply if your motorcycle is used for racing, even if the motorcycle is equipped for racing. Some states do not allow limitations on how long an implied warranty lasts, so the above limitation may not apply to you.

TO THE FULLEST EXTENT ALLOWED BY A LAW, NEITHER HARLEY-DAVIDSON, NOR ITS AUTHORIZED DEALERS SHALL BE LIABLE FOR LOSS OF TIME, INCONVENIENCE, LOSS OF MOTORCYCLE USE, COMMERCIAL LOSS OR ANY OTHER INCIDENTAL OR CONSEQUENTIAL DAMAGES.

Harley-Davidson and your dealer are not responsible for any time or income that you lose, any inconvenience, the loss of your transportation or use of your motorcycle, the cost of a rental motorcycle, fuel, travel, meals, or lodging, or for any other incidental or consequential damages you may have.

Punitive, exemplary, or multiple damages may not be recovered unless applicable law prohibits their disclaimer. You may not bring any warranty-related claim as a class

representative, a private attorney general, a member of a class of claimants or in any other representative capacity.

Harley-Davidson shall not be liable for any damages caused by delay in delivery or furnishing of any products and/or services.

Some states do not allow the exclusion or limitation of incidental or consequential damages, so the above limitation or exclusion may not apply to you.

This warranty gives you specific legal rights, and you may also have other rights which vary from state to state. Decisions based on state lemon laws, state arbitration awards and/or dispute resolution awards supersede Company policy.

The following terms and conditions apply to this limited warranty:

### **Duration**

1. The duration of this limited warranty is 24-months, starting from the earlier of:
  - a. The date of initial retail purchase and delivery of the motorcycle from an authorized Harley-Davidson dealer, or:

- b. Two (2) years after the model-year (MY) launch of the motorcycle in question.

- i. Example: An unsold MY22 motorcycle's limited warranty will start when the MY24 motorcycles start to ship.

Your authorized Harley-Davidson dealer will submit an electronic Sales and Warranty Registration form to initiate your limited warranty.

2. Any unexpired portion of this limited warranty will be transferred to subsequent owners, upon the resale of the motorcycle during the limited warranty period.

### **Owner's Obligations**

To obtain warranty service, return your motorcycle at your expense within the limited warranty period, to an authorized Harley-Davidson dealer. The authorized Harley-Davidson dealer should be able to provide warranty service during normal business hours, depending upon the workload of the authorized dealer's service department and the availability of necessary parts. The dealer may request that you make an appointment and deliver the motorcycle for diagnosis and repair at the scheduled time.

## Exclusions

This limited warranty will not apply to any On-Road motorcycle.

1. Which has not been operated or maintained as specified in the owner's manual.
2. Which has been abused, neglected, misused, improperly stored, used "off the highway," or used for racing or competition of any kind.
3. Which is not equipped to comply with the laws of the market in which it is registered.
4. Which has off-road parts or competition parts installed to enhance performance, a trailer hitch, or has other unapproved modifications (even if these modifications include genuine Harley-Davidson® parts and accessories that are not approved for use on your motorcycle). These modifications may void all or parts of your new motorcycle limited warranty. See an authorized Harley-Davidson dealer for details.
5. Which has been subjected to an act of God, war, riot, insurrection, nuclear contamination, natural disasters, including, but not limited to, lightning, forest fires, dust storms, hail storms, ice storms, earthquakes, or floods, or other circumstances out of Harley-Davidson's control.
6. Which has been in an accident or collision, dropped or struck.

## On-Road/Off-Road Vehicles

Harley-Davidson's Pan America was designed for on-road and moderate off-road use. This entails use on paved and gravel roads and groomed trails, but does not include competition courses, rally routes or similar uses.

### **This limited warranty will not apply to any On-Road/ Off-Road motorcycle**

1. Which has not been operated or maintained as specified in the Owner's Manual.
2. Which has been abused, neglected, misused, improperly stored, or used for racing or competition of any kind.
3. Which is not equipped to comply with the laws of the market in which it is registered.
4. Which has aftermarket off-road parts, competition parts installed to enhance performance, a trailer hitch, or has other unapproved modifications (even if these modifications include genuine Harley-Davidson® parts and accessories that are not approved for use on your motorcycle). These modifications may void all or parts of your new motorcycle limited warranty. See an authorized Harley-Davidson dealer for details.

5. Which has been subjected to an act of God, war, riot, insurrection, nuclear contamination, natural disasters, including, but not limited to, lightning, forest fires, dust storms, hail storms, ice storms, earthquakes, or floods, or other circumstances out of Harley-Davidson's control.
  6. Which has been in an accident, collision, dropped or struck.
4. Defects or damage to the motorcycle caused by alterations outside of Harley-Davidson factory specifications or caused by alterations or use of parts or accessories not approved for the make and model year of your motorcycle.
  5. Damage caused by installation or use of non-Harley-Davidson components, even those installed by an authorized Harley-Davidson dealership, that cause a genuine Harley-Davidson<sup>®</sup> part to fail. Examples include but are not limited to performance-enhancing powertrain components or software, exhaust systems, trailer hitches, non-approved tires, lowering kits, handlebars, add-ons connected to the factory electrical system, and auxiliary storage or luggage.

## Other Limitations

This limited warranty does not cover:

1. Parts and labor for normal maintenance as recommended in the Owner's Manual, or the replacement of parts due to normal wear and tear including, but not limited to, the following: light bulbs, tires, lubrication, oil and filter change, fuel system cleaning, battery maintenance, engine tune-up, spark plugs, brake, clutch, chain/belt adjustments and chain replacement.
2. Cosmetic concerns that arise as a result of owner abuse, lack of proper maintenance or environmental conditions (except concerns that result from defects in factory materials or workmanship, which are covered by this limited warranty for the duration of the limited warranty period).
3. Any cosmetic condition existing at the time of retail delivery that has not been documented by the authorized Harley-Davidson selling dealer prior to retail delivery.
6. Upgraded parts are not allowed as a warranty replacement. The limited warranty allows for repair or replacement of failed parts to put the vehicle, component or part back to its original condition with factory supplied materials and as delivered. We will take all steps to repair/replace the part to make it correct for the customer. This does not include upgrades to parts - unless no other suitable component is available as a direct replacement. This would require an authorization prior to repair.

7. **United States customers:** Defects or damage impacting the functionality of powertrain components in a motorcycle that has been tuned using a tuner or calibration that was not covered by a California ARB Executive Order or otherwise approved by EPA.

### **Important: Read Carefully**

1. Authorized Harley-Davidson dealers are independently owned and operated and may sell non-Harley-Davidson products. Because of this, HARLEY-DAVIDSON IS NOT RESPONSIBLE FOR THE SAFETY, QUALITY, OR SUITABILITY OF ANY NON-HARLEY-DAVIDSON PART, ACCESSORY OR DESIGN MODIFICATION INCLUDING, BUT NOT LIMITED TO, LABOR WHICH MAY BE SOLD AND/OR INSTALLED BY AUTHORIZED HARLEY-DAVIDSON DEALERS.
2. This limited warranty is a contract between you and Harley-Davidson. It is separate and apart from any warranty or service plan you may receive or purchase from an authorized Harley-Davidson dealer. An authorized Harley-Davidson dealer is not authorized to alter, modify, expand, or in any way change the terms and conditions of this limited warranty.
3. Any warranty work or parts replacement authorized by Harley-Davidson will not preclude Harley-Davidson from later relying on any exclusion where applicable.

4. Harley-Davidson and its authorized dealers reserve the right to modify or service motorcycles designed and manufactured by Harley-Davidson at any time without incurring any additional obligation to make the same alteration or change to a motorcycle previously built and sold. Harley-Davidson reserves the right to provide post-warranty repairs, conduct repair campaigns, offer good-will or customer satisfaction repairs or extend the warranty coverage for certain motorcycles at its sole discretion. Said repairs or extensions of warranty coverage in no way obligate Harley-Davidson to provide similar accommodations to other owners of similar motorcycles. Sometimes Harley-Davidson may offer a special adjustment program to pay all or part of the cost of certain repairs beyond the terms of your limited warranty. Check with your authorized Harley-Davidson dealer to learn whether such programs are available. Your state may prohibit these types of offers, in which case, they may not be available.
5. The fact that a part is labeled, or branded Harley-Davidson does not necessarily make it appropriate or warranted for the make and model of the motorcycle. The use of parts not designed and tested for the motorcycle may have negative consequences on the performance of the motorcycle and may create conditions not covered by the limited warranty.

## Environmental Factors

1. Warranty will cover rust/corrosion and/or pitting on one component, one time only, under appropriate conditions. If a vehicle is exhibiting any of these conditions on more than one component, warranty coverage will be denied.
2. Warranty will cover rust/corrosion and/or pitting on multiple components only if they are the same component (i.e. both mirrors, both rider footboards, etc.)
3. Warranty will not cover rust/corrosion and/or pitting on wheels at any time unless the condition had been properly documented in the DPQA. For warrantable conditions see Cosmetic Quality Guide.

4. Warranty will not cover rust/corrosion and/or pitting as a result of damage from road debris, hazards, neglect, chemical exposure or abuse/misuse of the motorcycle.
5. Warranty will not cover rust/corrosion inside fuel tanks.
6. Warranty will not cover rust/corrosion and/or pitting or part wear that results from off-road use.

The owner is responsible for protecting the motorcycle from any cosmetic concerns that result from use and/or from exposure to the elements.



## 2022 AUSTRALIA/NEW ZEALAND HARLEY-DAVIDSON MOTORCYCLE LIMITED WARRANTY

### 24 Months/Unlimited Miles

This motorcycle limited warranty, referred to below as the "H-D Motorcycle Warranty" applies to all persons who purchase a new 2022 or prior-model Harley-Davidson motorcycle in Australia and New Zealand only after 1st January 2021.

### Your Consumer Rights

The benefits given to you under this H-D Motorcycle Warranty are additional to, and do not detract from, other rights and remedies that you may have in respect of the motorcycle under Australian and New Zealand laws, including consumer protection laws.

In Australia, our goods come with guarantees that cannot be excluded under the Australian Consumer Law. You are entitled to a replacement or refund for a major failure and compensation for any other reasonably foreseeable loss or damage. You are also entitled to have the goods repaired or replaced if the goods fail to be of acceptable quality and the failure does not amount to a major failure.

In New Zealand, our goods also come with guarantees that cannot be excluded under the New Zealand Consumer Guarantees Act.

### Warranty

This H-D Motorcycle Warranty, is provided by **Harley-Davidson, Motor Company**, P.O. Box 653, Milwaukee, Wisconsin 53201, U.S.A, phone: +1 (414) 343-4056, ("Harley-Davidson").

Harley-Davidson warrants for any new 2022 Harley-Davidson motorcycle that an authorised Harley-Davidson dealer will repair or replace without charge any parts found to be defective in factory materials or workmanship under normal use during the warranty period set out below.

Such repair or replacement of parts will be Harley-Davidson's sole obligation and your sole remedy under this H-D Motorcycle Warranty, however you may have other rights under Australian and New Zealand laws, as described above.

**Note:** Goods presented for repair may be replaced by refurbished goods of the same type rather than being repaired. Refurbished parts may be used to repair goods.

The following terms and conditions apply to this H-D Motorcycle Warranty:

## Warranty Period

1. The duration of this limited warranty is 24-months, starting from the earlier of:
  - a. The date of initial retail purchase and delivery of the motorcycle from an authorized Harley-Davidson dealer, or:
  - b. Two (2) years after the model-year (MY) launch of the motorcycle in question.
  - i. Example: An unsold MY22 motorcycle's limited warranty will start when the MY24 motorcycles start to ship.

Your authorized Harley-Davidson dealer will submit an electronic Sales and Warranty Registration form to initiate your limited warranty.

**Note:** If the motorcycle was used as a demonstrator or company motorcycle, then the warranty period may have started and/or expired prior to the initial retail sale. See an authorized Harley-Davidson dealer for details.

2. Any unexpired portion of this limited warranty will be transferred to subsequent owners, upon the resale of the motorcycle during the limited warranty period.

## Obtaining Warranty Service

To obtain warranty service, return your motorcycle at your expense within the warranty period to an authorized dealer. Harley-Davidson's network of authorized dealers is large, and continues to expand. To find current contact information for your nearest authorized dealer, visit our website at [www.h-d.com.au](http://www.h-d.com.au).

The authorized Harley-Davidson dealer should be able to provide warranty service during normal business hours and as soon as possible, depending upon the workload of the authorized dealer's service department and the availability of necessary parts

You are responsible for collecting the motorcycle from the authorized dealer once the warranty service has been completed, at your expense.

## Exclusions

This H-D Motorcycle Warranty will not apply to any On-Road motorcycle (or part or accessory):

1. Which has not been operated or maintained as specified in the Owner's Manual.
2. Which has been abused, neglected, misused, improperly stored, used "off the highway," or used for racing or competition of any kind.

3. Which was not originally manufactured for use or sold in Australia and New Zealand and/or does not comply with Australian and New Zealand homologation requirements.
4. Which has off-road parts or competition parts installed to enhance performance, or has unapproved modifications. These modifications may void all or part of your new H-D Motorcycle Warranty. See an authorised Harley-Davidson dealer for details.
5. Where damage is caused by, or Harley-Davidson is unable to honour this H-D Motorcycle Warranty due to, acts of God, war, riot, insurrection, natural disasters, including, but not limited to, nuclear contamination, lightning, forest fires, dust storms, hail storms, ice storms, earthquakes, floods, or other circumstances out of Harley-Davidson's control.
6. Which has been in an accident, collision, dropped or struck.

**Note:** Even though this H-D Motorcycle Warranty does not apply in the circumstances set out above, you may still have rights under Australian and New Zealand laws, including the Australian Consumer Law in such circumstances.

### **On-Road/Off-Road Vehicles**

Harley-Davidson's Pan America was designed for on-road and moderate off-road use. This entails use on paved and

gravel roads and groomed trails, but does not include competition courses, rally routes or similar uses.

### **This limited warranty will not apply to any On-Road/Off-Road motorcycle:**

1. Which has not been operated or maintained as specified in the Owner's Manual.
2. Which has been abused, neglected, misused, improperly stored, used "off the highway," or used for racing or competition of any kind.
3. Which is not equipped to comply with the laws of the market in which it is registered.
4. Which has aftermarket off-road parts, competition parts installed to enhance performance, a trailer hitch, or has other unapproved modifications (even if these modifications include genuine Harley-Davidson® parts and accessories that are not approved for use on your motorcycle). These modifications may void all or parts of your new motorcycle limited warranty. See an authorized Harley-Davidson dealer for details.
5. Which has been subjected to an act of God, war, riot, insurrection, nuclear contamination, natural disasters, including, but not limited to, lightning, forest fires, dust storms, hail storms, ice storms, earthquakes, or floods, or other circumstances out of Harley-Davidson's control.

6. Which has been in an accident, collision, dropped or struck.

## Other Limitations

This H-D Motorcycle Warranty does not cover:

1. Parts and accessories not manufactured by Harley-Davidson, or any damage caused to the motorcycle by the installation of such parts and accessories, even if such parts and accessories are installed on the motorcycle at the date of initial retail purchase. A separate third party warranty may apply to such parts and accessories. See an authorised Harley-Davidson dealer for details.
2. Parts and labour for normal maintenance as recommended in the Owner's Manual, or the replacement of parts due to normal wear and tear including, but not limited to, the following: light bulbs, tyres, lubrication, oil and filter change, fuel system cleaning, battery maintenance, engine tune-up, spark plugs, brake, clutch, chain/belt adjustment and chain replacement.
3. Cosmetic or other concerns that arise as a result of owner abuse, lack of proper maintenance or environmental conditions (except concerns that result from defects in factory materials or workmanship, which are covered by this H-D Motorcycle Warranty for the duration of the warranty period).

4. Any cosmetic condition existing at the time of retail delivery that has not been documented by the authorised Harley-Davidson selling dealer prior to retail delivery.
5. Defects or damage to the motorcycle caused by alterations outside of Harley-Davidson's factory specifications, including the installation of competition or closed course parts and accessories and the addition of loads and stresses to the motorcycle above those recommended by Harley-Davidson.
6. Damage caused by installation or use of non-Harley-Davidson components, even those installed by an authorised dealership, that cause a Harley-Davidson part to fail. Examples include, but are not limited to performance-enhancing powertrain components or software, exhaust systems, non-approved tyres, lowering kits, handlebars, add-ons connected to the factory electrical system, auxiliary storage or luggage, tow bars, etc.

**Note:** Even though this H-D Motorcycle Warranty does not cover the circumstances set out above, you may still have rights under Australian and New Zealand laws, including the Australian Consumer Law.

## Important: Read Carefully

1. Authorised Harley-Davidson dealers are independently owned and operated and may sell non-Harley-Davidson products. Because of this, HARLEY-DAVIDSON IS NOT RESPONSIBLE FOR THE SAFETY, QUALITY, OR SUITABILITY OF ANY NON-HARLEY-DAVIDSON PART, ACCESSORY OR DESIGN MODIFICATION WHICH MAY BE SOLD AND/OR INSTALLED BY AUTHORISED HARLEY-DAVIDSON DEALERS OR LABOUR CARRIED OUT BY DEALERS.
2. This H-D Motorcycle Warranty is a contract between you and Harley-Davidson. It is separate and apart from any warranty you may receive or purchase from an authorised Harley-Davidson dealer. An authorised Harley-Davidson dealer is not authorised to alter, modify, or in any way change the terms and conditions of this H-D Motorcycle Warranty.

Any warranty work or parts replacement authorised by Harley-Davidson will not preclude Harley-Davidson from later relying on any exclusion where Harley-Davidson later becomes aware that an exclusion applied or the warranty claim did not otherwise comply with the terms of this H-D Motorcycle Warranty.

## Environmental Factors

1. Warranty will cover rust/corrosion and/or pitting on one component, one time only, under appropriate conditions. If a vehicle is exhibiting any of these conditions on more than one component, warranty coverage will be denied.
2. Warranty will cover rust/corrosion and/or pitting on multiple components only if they are the same component (i.e. both mirrors, both rider footboards, etc.)
3. Warranty will not cover rust/corrosion and/or pitting on wheels at any time unless the condition had been properly documented in the DPQA. For warrantable conditions see Cosmetic Quality Guide.
4. Warranty will not cover rust/corrosion and/or pitting as a result of damage from road debris, hazards, neglect, chemical exposure or abuse/misuse of the motorcycle.
5. Warranty will not cover rust/corrosion inside fuel tanks.
6. Warranty will not cover rust/corrosion and/or pitting or part wear that results from off-road use.

The owner is responsible for protecting the motorcycle from any cosmetic concerns that result from use and/or from exposure to the elements.

# NOTES

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## 2022 HARLEY-DAVIDSON MOTORCYCLE NOISE CONTROL SYSTEM LIMITED WARRANTY

The following limited warranty applies to the noise control system, is in addition to the MOTORCYCLE LIMITED WARRANTY and EMISSION CONTROL SYSTEM LIMITED WARRANTY, and applies only to Harley-Davidson motorcycles sold in the U.S.

Harley-Davidson warrants to the first owner and each subsequent owner that this motorcycle is designed and built so as to conform at the time of sale with applicable regulations of the U.S. Environmental Protection Agency (as tested following F-76 Drive-By test procedure) and that it is free from defects in factory materials and workmanship which can cause this motorcycle not to meet U.S. Environmental Protection Agency Standards within one (1) year from initial retail purchase and delivery from an authorized Harley-Davidson dealer or one (1) year from the [second] anniversary of the last day of the model year of the motorcycle, or 6,000 km (3730 mi) whichever occurs first. Any unexpired portion of this limited warranty will be transferred to subsequent owners, upon the resale of the motorcycle during the limited warranty period. If the motorcycle was used as a demonstrator or company motorcycle, then the limited warranty period may have started and/or expired prior to the initial retail sale. See an authorized Harley-Davidson dealer for details.

THERE IS NO OTHER EXPRESS WARRANTY (OTHER THAN THE SEPARATE MOTORCYCLE AND EMISSIONS LIMITED WARRANTIES) ON THE MOTORCYCLE. ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR PARTICULAR PURPOSE IS LIMITED TO THE DURATION OF THIS LIMITED WARRANTY.

Some states do not allow limitations on how long an implied warranty lasts, so the above limitation may not apply to you.

The limited warranty period shall begin on the date the motorcycle is delivered to the first retail purchaser or, if the motorcycle is placed in service as a demonstrator or company motorcycle prior to sale at retail, on the date it is first placed in service.

### THE FOLLOWING ITEMS ARE NOT COVERED BY THE NOISE CONTROL SYSTEM LIMITED WARRANTY

1. Failures which arise as a result of misuse, alteration, or non-performance of maintenance as specified in the Owner's Manual.
2. Replacing, removing, or modifying any portion of the NOISE CONTROL SYSTEM (consisting of the exhaust system and air intake/cleaner assembly) with parts not certified to be noise legal for street use.
3. Any motorcycle on which the odometer mileage has been changed so that the mileage cannot be determined.

4. TO THE FULLEST EXTENT ALLOWED BY LAW, NEITHER HARLEY-DAVIDSON NOR ITS AUTHORIZED DEALERS SHALL BE LIABLE FOR LOSS OF TIME, INCONVENIENCE, LOSS OF MOTORCYCLE USE, COMMERCIAL LOSS OR OTHER INCIDENTAL OR CONSEQUENTIAL DAMAGES.

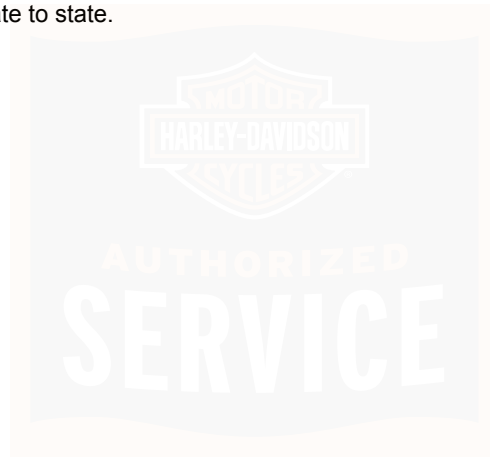
Some states do not allow the exclusion or limitation of incidental or consequential damages, so the above limitation or exclusion may not apply to you.

### **Other Rights**

This limited warranty gives you specific legal rights, and you may have other rights which vary from state to state.

### **Recommendations for Required Maintenance**

It is recommended that any noise system maintenance be performed by an authorized Harley-Davidson dealer using genuine Harley-Davidson replacement parts. The maintenance, replacement or repair of the noise control system may be performed by any other qualified service outlet or individual. Non-genuine Harley-Davidson parts may be used only if such parts are certified to comply with U.S. Environmental Protection Agency Standards.



## 2022 HARLEY-DAVIDSON EMISSION CONTROL SYSTEM LIMITED WARRANTY

### USA Owners 49 State Limited Emissions Warranty

The following limited warranty applies to the emission control system, is in addition to the MOTORCYCLE LIMITED WARRANTY and NOISE CONTROL SYSTEM LIMITED WARRANTY, and applies only to Harley-Davidson motorcycles certified for sale, registered, and normally operated in the U.S. For California models, refer to the CALIFORNIA EMISSIONS CONTROL WARRANTY STATEMENT for additional warranty provisions.

Harley-Davidson Motor Company warrants to the first owner and each subsequent owner that this vehicle is designed, built, and equipped so as to conform at the time of sale with applicable regulations under section 7521 of Title 42 of the United States Code, and that it is free from defects in materials and workmanship which would cause this motorcycle to fail to conform with applicable emissions regulations for five (5) years from the initial retail purchase and delivery from an authorized Harley-Davidson dealer (or five (5) years from the date the motorcycle is first placed in service, if it is first placed in service as a "demonstrator" or "company" motorcycle prior to delivery), or 30,000 km (18641 mi), whichever occurs first. Any unexpired portion of this limited warranty will be

transferred to subsequent owners, upon the resale of the motorcycle during the warranty period.

THERE IS NO OTHER EXPRESS WARRANTY (OTHER THAN THE SEPARATE MOTORCYCLE AND NOISE LIMITED WARRANTIES) ON THE MOTORCYCLE. ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR PARTICULAR PURPOSE IS LIMITED TO THE DURATION OF THIS WARRANTY.

Some states do not allow limitations on how long an implied warranty lasts, so the above limitation may not apply to you.

The limited warranty period shall begin on the date the motorcycle is delivered to the first retail purchaser or, if the motorcycle is placed in service as a demonstrator or company motorcycle prior to sale at retail, on the date it is first placed in service.

THE FOLLOWING ITEMS ARE NOT COVERED BY THE EMISSION CONTROL SYSTEM LIMITED WARRANTY

1. Failures which arise as a result of misuse, tampering, alterations, accident, acts of nature, or improper or inadequate maintenance as specified in the Owner's Manual.
2. Required maintenance services (as specified in the Owner's Manual) and the replacement of parts (such as spark plugs, fuel and oil filters, etc.) used in required maintenance.

3. Any motorcycle on which the odometer mileage has been changed so that the mileage cannot be determined.
4. TO THE FULLEST EXTENT ALLOWED BY LAW, NEITHER HARLEY-DAVIDSON NOR ITS AUTHORIZED DEALERS SHALL BE LIABLE FOR LOSS OF TIME, INCONVENIENCE, TOWING OF THE VEHICLE, LOSS OF MOTORCYCLE USE, COMMERCIAL LOSS OR OTHER INCIDENTAL OR CONSEQUENTIAL DAMAGES.

Some states do not allow the exclusion or limitation of incidental or consequential damages, so the above limitation or exclusion may not apply to you.

### **Items Covered by this Emission Warranty**

The emission control system warranty may cover the following parts if the defect is deemed to be emissions-related:

- Air cleaner assembly
- Cam shaft
- Spark plug
- Ignition coil
- Ignition wires
- Vapor valve
- Catalytic converter

- Muffler
- Crankcase breather
- MAP sensor
- TMAP sensor
- Intake air temperature sensor
- Throttle position sensor
- Fuel injectors
- Induction module or throttle body
- Engine temperature sensor
- Electronic control unit
- Oxygen sensors
- Fuel pump module
- Engine Control Module

### **Fuel Tank** (non-cosmetic failures only)

- Leaks
- Fuel vapor separator
- Fuel cap

If used on the above: hoses, clamps, fittings, tubing, sealing gaskets and mounting hardware.

Detailed instructions for proper maintenance and use of this motorcycle, including the time and/or mileage intervals at which such maintenance is to be performed, may be found in this Owner's Manual under SERVICE INTERVALS AND RECORDS > SERVICE RECORDS (Page 261).

### **Other Rights**

This limited warranty gives you specific legal rights, and you may have other rights which vary from state to state.

### **Recommendations for Required Maintenance**

It is recommended that any emission system maintenance be performed by an authorized Harley-Davidson dealer using genuine Harley-Davidson replacement parts. However the maintenance, replacement or repair of the emissions control system may be performed by any other qualified service outlet or individual. Non-genuine Harley-Davidson parts may be used only if such parts are certified to comply with U.S. Environmental Protection Agency Standards.



# NOTES

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# CALIFORNIA EMISSIONS CONTROL WARRANTY STATEMENT

## USA Owners California Limited Emissions Warranty

### Your Warranty Rights and Obligations

The California Air Resources Board and Harley-Davidson Motor Company are pleased to explain the emission control system warranty on your new motorcycle. In California, new motor vehicles must be designed, built and equipped to meet the State's stringent anti-smog standards. Harley-Davidson Motor Company warrants the emission control system on your motorcycle for the periods of time listed below, provided there has been no abuse, unapproved modification, neglect or improper maintenance of your motorcycle.

Your emission control system may include parts such as the carburetor or fuel-injection system, the ignition system, catalytic converter, and engine computer. Also included may be hoses, belts, connectors and other emission-related assemblies.

Where a warrantable condition exists, within the warranty period noted below, Harley-Davidson will repair your motorcycle at no cost to you including diagnosis, parts and labor.

### Manufacturer's Warranty Coverage

For a period of use of five years or 30,000 km (18641 mi), whichever first occurs, beginning on the date the motorcycle is delivered to the ultimate purchaser or, if the motorcycle is placed in service as a demonstrator or company motorcycle prior to sale at retail, the date it is first placed in service.

If any emission-related part on your motorcycle is defective, the part will be repaired or replaced by Harley-Davidson Motor Company. This is your emission control system DEFECTS WARRANTY.

### Owner's Warranty Responsibilities

As the motorcycle owner, you are responsible for the performance of the required maintenance listed in your Owner's Manual. Harley-Davidson recommends that you retain all receipts covering maintenance on your motorcycle, but Harley-Davidson cannot deny emissions warranty coverage solely for the lack of receipts or for your failure to ensure the performance of all scheduled maintenance, unless the condition is caused by your lack of maintenance or improper maintenance.

You are responsible for presenting your motorcycle to an authorized Harley-Davidson dealer as soon as a problem exists. The warranty repairs should be completed in a reasonable amount of time, not to exceed 30 days.

As the motorcycle owner, you should also be aware that Harley-Davidson may deny you warranty coverage if your motorcycle or a part has failed due to abuse, neglect, improper maintenance or unapproved modifications.

If you have any questions regarding your warranty rights and responsibilities, you should contact Harley-Davidson Customer Service Department at 1-800-258-2464 (U.S. only) or 1-414-343-4056, or the California Air Resources Board at 9528 Telstar Ave., El Monte, California 91731.

## **Additional Warranty Terms**

The emission control system of each new Harley-Davidson motorcycle was designed, built and tested using only Genuine Harley-Davidson parts and with these parts the motorcycle is certified as being in conformity with California emission control regulations.

We recommend that you take your motorcycle to an authorized Harley-Davidson dealer for repairs under this warranty. The dealer has factory-trained mechanics and genuine Harley-Davidson parts. However, in the case of an "emergency" (as defined below), you may have repairs performed at any available service establishment or by the owner, using any replacement part. An authorized Harley-Davidson dealer not being reasonably available, or a part not being available within a reasonable time period (not to exceed 30 days from the time the motorcycle is initially presented to a Harley-Davidson dealer for repair) constitutes

an "emergency." Harley-Davidson will reimburse the owner for such repairs, including diagnosis, only if it is established that the repairs are covered under this emission warranty. Harley-Davidson's parts reimbursement, however, will not exceed our suggested retail price for all warranted parts replaced and our labor reimbursement will be limited to our recommended time allowances for emission system repairs at the geographically appropriate hourly labor rate.

To obtain reimbursement from Harley-Davidson for such emergency repairs, you must keep all failed parts and original receipts, so you can present them to an authorized Harley-Davidson dealer for inspection. Harley-Davidson recommends that you bring your motorcycle to an authorized dealer for inspection to ensure that the emergency repairs were done properly.

**Remember:** Use of non-Harley-Davidson replacement parts may impair the effectiveness of the emission control system or otherwise damage your motorcycle. If other than genuine Harley-Davidson parts are used for maintenance, replacement or repair of components affecting emission control, you should obtain written assurances that such non-Harley-Davidson parts are warranted by their manufacturer to be equal in quality to Genuine Harley-Davidson parts in both performance and durability. The use of non-Harley-Davidson replacement parts does not invalidate the existing warranty, if any, on other Harley-Davidson components unless the non-Harley-Davidson parts cause damage to warranted parts or result in the creation

of an emissions non-compliant motorcycle. However, HARLEY-DAVIDSON ASSUMES NO LIABILITY UNDER THIS WARRANTY WITH RESPECT TO ANY PARTS WHICH ARE NOT GENUINE HARLEY-DAVIDSON PARTS, unless Harley-Davidson parts cause damage to non-genuine Harley-Davidson parts.

### **What Is Covered by this Emission Warranty**

The emission control system warranty covers the following "warranted parts" only:

- Air cleaner assembly
- Cam shaft
- Spark plug
- Ignition coil
- Ignition wires
- Vapor valve
- Catalytic converter
- Muffler
- Crankcase breather
- MAP sensor
- TMAP sensor
- Intake air temperature sensor

- Throttle position sensor
- Fuel injectors
- Induction module or throttle body
- Engine temperature sensor
- Electronic control unit
- Oxygen sensors
- Carbon canister
- Purge control valve
- Fuel pump module
- Engine Control Module

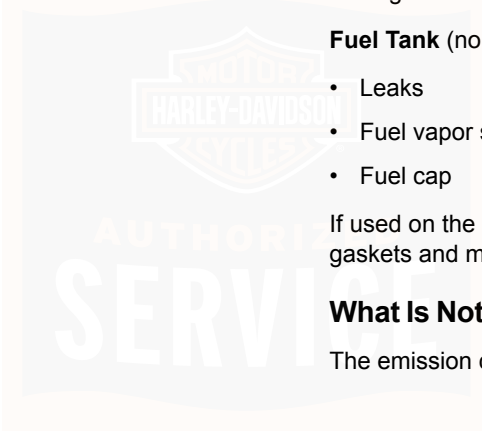
### **Fuel Tank** (non-cosmetic failures only)

- Leaks
- Fuel vapor separator
- Fuel cap

If used on the above: hoses, clamps, fittings, tubing, sealing gaskets and mounting hardware.

### **What Is Not Covered by this Emission Warranty**

The emission control system warranty does not cover:



Malfunctions in any "warranted parts" caused by any of the following: abuse, misuse, unapproved modification or alteration, tampering, disconnection, or improper or inadequate maintenance. The warranty also does not cover replacement of listed parts in the event that the vehicle has been rendered emissions non-compliant in the state of California through actions noted above .

Damage resulting from accident, acts of nature or other events beyond the control of Harley-Davidson.

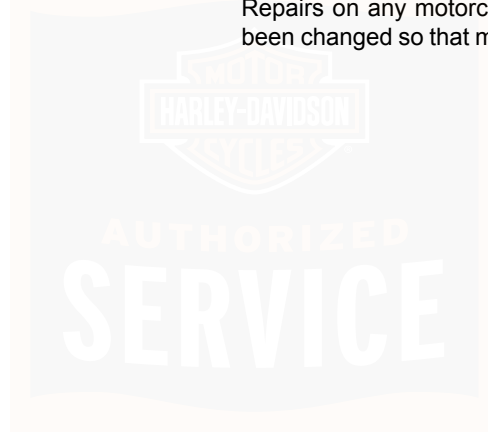
The repair or replacement of "warranted parts" which are scheduled for replacement prior to 30,000 km (18641 mi), once these parts have been replaced at the first replacement interval as part of required maintenance services.

TO THE FULLEST EXTENT ALLOWED BY LAW, NEITHER HARLEY-DAVIDSON NOR ITS AUTHORIZED DEALERS SHALL BE LIABLE FOR LOSS OF TIME, INCONVENIENCE, TOWING OF THE VEHICLE, LOSS OF MOTORCYCLE USE, COMMERCIAL LOSS OR OTHER INCIDENTAL OR CONSEQUENTIAL DAMAGES

Repairs and services performed by anyone other than an authorized Harley-Davidson Dealer (except in case of emergency as defined above).

Loss of time, inconvenience, loss of use of the motorcycle, towing of the vehicle, or commercial loss and/or consequential damages.

Repairs on any motorcycle of which odometer mileage has been changed so that mileage cannot be readily determined.



## 2022 LIMITED RADIO WARRANTY

Harley-Davidson warrants that your Harley-Davidson radio will be free from factory defects in factory materials and workmanship, under normal use and service, for a period of twenty-four (24) months starting from the earlier of (a) the date of initial retail purchase of the motorcycle on which the radio is installed, or (b) the third anniversary of the last day of the model year of the motorcycle on which the radio is installed. Any unexpired portion of this limited warranty will be transferred to subsequent owner(s), upon the resale of the motorcycle during the limited warranty period. If the motorcycle was used as a demonstrator or company motorcycle, then the limited warranty period may have started and/or expired prior to the initial retail sale. See an authorized Harley-Davidson Dealer for details.

This limited warranty does not cover defects or damage due to abuse, misuse or improper installation, or any radio on a motorcycle which has been registered with Harley-Davidson as a collector's vehicle. The limited warranty does not cover syncing issues or an improper functioning radio caused by an incompatible phone or other media storage device (MP3, jump drive, etc.). See an authorized Harley-Davidson dealer for details. Use of aftermarket parts may void all or parts of your limited warranty.

This limited warranty does not cover repairs under certain conditions. Examples include:

- Loss of personal media, software or data.
- Failure to provide proper installation environment.
- Damage caused by abnormal use, unauthorized modification, computer viruses, or installation of unauthorized software, peripherals and attachments; unauthorized, unapproved or incompatible devices or upgrades; or malfunction of a mobile phone or digital media device, including inadequate signal reception by the external antenna, viruses or other software problems.

To obtain warranty service, return your motorcycle with sound system intact, at your expense, within the limited warranty period to an authorized Harley-Davidson dealer. Authorized Harley-Davidson dealers should be able to provide warranty service during normal business hours depending upon the workload of the authorized dealer's service department and the availability of necessary parts.

The remedy for breach of this warranty is expressly limited to the repair or replacement (**which may include a refurbished replacement radio**), without charge for parts and labor, of any part that proves to be defective, AND DOES NOT EXTEND TO LIABILITY FOR CONSEQUENTIAL DAMAGES, COSTS OR EXPENSES, INCLUDING LOSS OF TIME, INCONVENIENCE, COMMERCIAL LOSS, OR LOSS OF USE OF THE VEHICLE, RESULTING FROM ANY PART THAT PROVES TO BE DEFECTIVE.

THERE IS NO OTHER EXPRESS WARRANTY ON THE RADIO. ANY IMPLIED WARRANTY RELATING TO THIS RADIO, INCLUDING WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, IS EXPRESSLY LIMITED TO THE DURATION OF THIS LIMITED WARRANTY.

TO THE FULLEST EXTENT ALLOWED BY LAW, HARLEY-DAVIDSON AND ITS AUTHORIZED DEALERS SHALL NOT BE LIABLE FOR LOSS OF TIME, INCONVENIENCE, LOSS OF MOTORCYCLE USE,

COMMERCIAL LOSS OR ANY OTHER INCIDENTAL OR CONSEQUENTIAL DAMAGES.

Some states do not allow the exclusion or limitation of incidental or consequential damages, so the above limitation or exclusion may not apply to you.

### **Other Rights**

This warranty gives you specific legal rights, and you may also have other rights which vary from state to state.



## 2022 AUSTRALIA/NEW ZEALAND LIMITED RADIO WARRANTY

### Your Consumer Rights

The benefits given to you under this H-D Radio Warranty are additional to, and do not detract from, other rights and remedies that you may have in respect of the radio or its installation under Australian and New Zealand laws, including consumer protection laws.

In Australia, our goods come with guarantees that cannot be excluded under the Australian Consumer Law. You are entitled to a replacement or refund for a major failure and compensation for any other reasonably foreseeable loss or damage. You are also entitled to have the goods repaired or replaced if the goods fail to be of acceptable quality and the failure does not amount to a major failure.

In New Zealand, our goods also come with guarantees that cannot be excluded under the New Zealand Consumer Guarantees Act.

### Warranty

This warranty is provided by Harley-Davidson Motor Company P.O. Box 653, Milwaukee, Wisconsin 53201, U.S.A, phone: +1 (414 343-4056) ("Harley-Davidson").

Harley-Davidson warrants that an authorised Harley-Davidson dealer will repair or replace your Harley-Davidson radio if it is found to be defective in factory materials or workmanship, under normal use and service, during the warranty period set out below.

Such repair or replacement will be Harley-Davidson's sole obligation and your sole remedy under this H-D Radio Warranty, however you may have other rights under Australian and New Zealand laws, as described above.

**Note** that goods presented for repair may be replaced by refurbished goods of the same type rather than being repaired. Refurbished parts may be used to repair goods.

### Warranty Period

The warranty period is a period of twenty-four (24) months starting from the earlier of:

- (a) the date of delivery of the motorcycle on which the radio is installed by an authorised Harley-Davidson dealer to the first retail purchaser; or
- (b) the third anniversary of the last day of the model year of the motorcycle on which the radio is installed (if not sold to a retail purchaser before that date).

Any unexpired portion of this H-D Radio Warranty will be transferred to subsequent owners, upon the resale of the motorcycle during the limited warranty period. See the

OWNER CONTACT INFORMATION section of this Owner's Manual for information regarding notification of ownership changes.

**Note:** If the motorcycle was used as a demonstrator or company motorcycle, then the warranty period may have started and/or expired prior to the initial retail sale. See an authorised Harley-Davidson dealer for details.

## Exclusions

This H-D Radio Warranty does not cover defects or damage due to abuse, misuse or improper installation, or any radio on a motorcycle which has been registered with Harley-Davidson as a collector's vehicle. The limited warranty

does not cover syncing issues or an improper functioning radio caused by an incompatible phone or other media storage device (MP3, jump drive, etc.). See an authorised Harley-Davidson dealer for details.

## Obtaining Warranty Service

To obtain warranty service, return your motorcycle with sound system intact, at your expense, within the warranty period to an authorised Harley-Davidson dealer.

Harley-Davidson's network of authorised dealers is large, and continues to expand. To find current contact information for your nearest authorised dealer, visit our website at [www.h-d.com.au](http://www.h-d.com.au).



## SERVICE RECORDS

### Regular Service Intervals

Service must be performed at specified intervals to keep your Harley-Davidson motorcycle operating at peak performance. Refer to Service Intervals for table.

Refer to Service Actions for service action definitions used in the service interval table.

**NOTE**

- *The use of parts and service procedures other than Harley-Davidson approved parts and service procedures may void the limited warranty. Any alterations to the emission system components, such as the intake and exhaust system, may be in violation of motor vehicle laws.*

- *Some countries, such as Brazil, may require all regular maintenance or additional annual (or semi-annual) regular maintenance steps to be performed to keep your limited warranty in effect and/or comply with vehicle regulations. Check with your authorized Harley-Davidson dealer as well as the motorcycle regulations in your country.*
- *Whenever a vehicle is in for maintenance:*
  - always check for and complete recalls and open product programs.*
  - always verify that the latest calibration is installed.*
- *After completing the final service interval, repeat the service schedule starting at the 8000 km (5000 mi) interval.*

### Service Intervals

**Table 49. Regular Service Intervals: Harley-Davidson Touring Models**

COMPONENT	ACTION	1600 KM 1000 MI	8000 KM 5000 MI	16000 KM 10000 MI	24000 KM 15000 MI	32000 KM 20000 MI	40000 KM 25000 MI	48000 KM 30000 MI	56000 KM 35000 MI	64000 KM 40000 MI	72000 KM 45000 MI	80000 KM 50000 MI	NOTES
<b>Service Intervals</b>													
Electrical equipment and switches	Inspect	x	x	x	x	x	x	x	x	x	x	x	
Front tire pressure and tread	Check	x	x	x	x	x	x	x	x	x	x	x	1

**Table 49. Regular Service Intervals: Harley-Davidson Touring Models**

COMPONENT	ACTION													NOTES
		1600 KM 1000 MI	8000 KM 5000 MI	16000 KM 10000 MI	24000 KM 15000 MI	32000 KM 20000 MI	40000 KM 25000 MI	48000 KM 30000 MI	56000 KM 35000 MI	64000 KM 40000 MI	72000 KM 45000 MI	80000 KM 50000 MI		
Front wheel spoke tightness (if equipped)	Check	x	x			x			x			x	2, 4, 3	
Front brake fluid level	Inspect	x	x	x	x	x	x	x	x	x	x	x	7	
Clutch cable	Lubricate	x	x	x	x	x	x	x	x	x	x	x	8	
Clutch cable	Adjust	x	x	x	x	x	x	x	x	x	x	x	6, 2	
Front brake fluid moisture content	Check	x	x	x	x	x	x	x	x	x	x	x	1, 2	
Hand control switch housing screw torque	Tighten	x		x		x		x		x		x	1, 2, 5	
Clutch lever handlebar clamp screw torque	Tighten	x		x		x		x		x		x	1, 2, 5	
Front brake handlebar clamp screw torque	Tighten	x		x		x		x		x		x	1, 2, 5	
Steering head bearings	Lubricate						x					x	2	
Windshield bushings (if equipped)	Inspect			x		x		x		x		x		
Air cleaner filter	Inspect		x	x	x	x	x	x	x	x	x	x	3	
Engine oil and filter	Replace	x	x	x	x	x	x	x	x	x	x	x	1, 3	
Engine coolant	Check	x	x	x	x	x	x	x	x	x	x	x	9	
Engine coolant	Replace									x			2	
Radiators or oil cooler	Clean	x	x	x	x	x	x	x	x	x	x	x		
Primary chaincase lubricant	Replace	x		x		x		x		x		x	3	
Transmission lubricant	Replace	x				x				x			3	
Oil and brake lines	Inspect	x	x	x	x	x	x	x	x	x	x	x	1, 2, 6	
Fuel lines and fittings	Inspect	x	x	x	x	x	x	x	x	x	x	x	1, 2, 6	

Table 49. Regular Service Intervals: Harley-Davidson Touring Models

COMPONENT	ACTION													NOTES
		1600 KM 1000 MI	8000 KM 5000 MI	16000 KM 10000 MI	24000 KM 15000 MI	32000 KM 20000 MI	40000 KM 25000 MI	48000 KM 30000 MI	56000 KM 35000 MI	64000 KM 40000 MI	72000 KM 45000 MI	80000 KM 50000 MI		
Rear brake fluid level	Inspect	x	x	x	x	x	x	x	x	x	x	x	7	
DOT4 rear brake fluid moisture content	Check	x	x	x	x	x	x	x	x	x	x	x	1, 2	
Brake systems	Replace	<b>..... Flush brake systems and replace DOT 4 hydraulic brake fluid every two years or sooner if moisture content is 3 percent or greater. ....</b>											2	
Brake pads and discs	Inspect	x	x	x	x	x	x	x	x	x	x	x		
Front axle nut torque	Tighten	x		x		x		x		x		x	1, 2, 5	
Jiffy stand	Lubricate	x	x	x	x	x	x	x	x	x	x	x	2, 3	
Brake and clutch controls	Lubricate	x	x	x	x	x	x	x	x	x	x	x	2, 8	
Rear wheel spoke tightness (if equipped)	Check	x	x			x				x		x	2, 3, 4	
Rear tire pressure and tread	Check	x	x	x	x	x	x	x	x	x	x	x	1	
Drive belt and sprockets	Inspect	x	x	x	x	x	x	x	x	x	x	x	2	
Drive belt	Adjust	x	x	x	x	x	x	x	x	x	x	x	2	
Rear sprocket isolators	Inspect	<b>..... Inspect rear sprocket isolators for wear at each rear tire change. ....</b>												
Rear axle nut torque	Tighten	x		x		x		x		x		x	1, 2, 5	
Exhaust system, fasteners and shields	Inspect	x	x	x	x	x	x	x	x	x	x	x	1, 3	
12 volt battery	Check	<b>..... Check battery, terminal torque and clean connections annually. Lubricate terminals with ELECTRICAL CONTACT LUBRICANT. ....</b>											1	
Spark plugs	Replace	<b>..... Replace spark plugs every two years or every 30,000 mi (48,000 km), whichever comes first. ....</b>												
Fuel door hinge and latch	Lubricate	x	x	x	x	x	x	x	x	x	x	x	8	

**Table 49. Regular Service Intervals: Harley-Davidson Touring Models**

COMPONENT	ACTION	1600 KM 1000 MI	8000 KM 5000 MI	16000 KM 10000 MI	24000 KM 15000 MI	32000 KM 20000 MI	40000 KM 25000 MI	48000 KM 30000 MI	56000 KM 35000 MI	64000 KM 40000 MI	72000 KM 45000 MI	80000 KM 50000 MI	NOTES
Front forks	Rebuild											x	2
Fuel filter	Replace	Replace fuel filter element every 100,000 mi (161,000 km).											2, 3
Component and system functions	Road Test	x	x	x	x	x	x	x	x	x	x	x	
<b>NOTES</b>													
<p>1. Perform annually or at specified intervals, whichever comes first.</p> <p>2. Should be performed by an authorized Harley-Davidson dealer, unless you have the proper tools, service data and are mechanically qualified.</p> <p>3. Perform maintenance more frequently in severe riding conditions. This includes extreme temperatures, dusty environments, mountainous or rough roads, long storage conditions, short runs, heavy stop/go traffic or poor fuel quality.</p> <p>4. Perform spoke tension check at 1,000 mi (2,000 km), 5,000 mi (8,000 km), 20,000 mi (32,000 km) services and every 15,000 mi (24,000 km) interval thereafter. Not all vehicles have spoked wheels. Consult appropriate topic in the service manual.</p> <p>5. For torque instructions, see Shop Practices in the service manual.</p> <p>6. Check for leaks, contact or abrasion.</p> <p>7. Brake fluid level drops as brake pads wear.</p> <p>8. Use HARLEY LUBE.</p> <p>9. Check coolant level, freeze point and inspect for leaks.</p>													

## Service Actions

**Table 50. Service Action Definitions**

<b>ACTION</b>	<b>DEFINITION</b>
Inspect	Carefully examine component for excess wear, abnormality, contact, or leaks.
Check	Verify the component is within the owner's manual or service manual service limits. Adjust or repair as necessary.
Lubricate	Lubricate the component as specified in the owner's or service manual with Harley-Davidson approved product.

**Table 50. Service Action Definitions**

<b>ACTION</b>	<b>DEFINITION</b>
Replace	Replace the component at the specified intervals.
Clean	Clean the component as specified in the owner's or service manual.
Rebuild	Rebuild the component according to the procedures in the service manual.

## Maintenance Records

Maintain a record of this service to keep your new motorcycle limited warranty in force. Refer to Table 51.

**Table 51. Owner's Maintenance Records**

<b>SERVICE MILE INTERVAL</b>	<b>DATE</b>	<b>DEALER NUMBER</b>	<b>TECHNICIAN NAME</b>	<b>TECHNICIAN SIGNATURE</b>
1,600 km (1,000 mi)				
8,000 km (5,000 mi)				
16,000 km (10,000 mi)				
24,000 km (15,000 mi)				
32,000 km (20,000 mi)				
40,000 km (25,000 mi)				
48,000 km (30,000 mi)				
56,000 km (35,000 mi)				
64,000 km (40,000 mi)				
72,000 km (45,000 mi)				
80,000 km (50,000 mi)				

# NOTES

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## ACRONYMS AND ABBREVIATIONS

Table 52. Acronyms and Measurement Symbols

ITEM	DEFINITION
A	Amperes
ABS	Anti-lock braking system
AC	Alternating current
ACR	Automatic compression release
AGM	Absorbed glass mat (battery)
Ah	Ampere-hour
BCM	Body control module
°C	Celsius (Centigrade)
CCA	Cold cranking amps
CI	Cubic inch
cm	Centimeters
cm <sup>3</sup>	Cubic centimeters (cc)
CVO	Custom vehicle operations
DC	Direct current
DLC	Data link connector
DOM	Domestic
DT II	Digital Technician II
DTC	Diagnostic trouble code
ECM	Electronic control module
EFI	Electronic fuel injection
EHCU	Electro hydraulic control unit
EITMS	Engine idle temperature management system

Table 52. Acronyms and Measurement Symbols

ITEM	DEFINITION
EHCU	Electro hydraulic control unit
ETC	Electronic throttle control
EV	Electric vehicle
EVAP	Evaporative emissions control system
EVPT	Electric vehicle powertrain
EVSE	Electric vehicle supply equipment
°F	Fahrenheit
fl oz	Fluid ounce
ft	Feet
ft-lbs	Foot pounds
FTP	Flash to pass
g	Gram
gal	Gallon
GAWR	Gross axle weight rating
GND	Ground (electrical)
GPS	Global positioning system
GVWR	Gross vehicle weight rating
H-DSSS	Harley-Davidson smart security system
HCU	Hydraulic control unit
HDI	Harley-Davidson International
HP	Horsepower
HV	High voltage
Hz	Hertz
IGN	Ignition light/key switch position
IM	Instrument module

**Table 52. Acronyms and Measurement Symbols**

ITEM	DEFINITION
IMU	Inertia measurement unit
in	inch
in <sup>3</sup>	Cubic inch
<b>in-lbs</b>	Inch pounds
kg	Kilogram
km	Kilometer
km/h	Kilometers per hour
kPa	Kilopascal
kW	Kilowatt
L	Liter
lb	Pounds
LED	Light emitting diode
Li-ion	Lithium-Ion
LV	Low voltage
mA	Milliampere
mi	Mile
MIL	Malfunction indicator lamp
Min	Minimum
mL	Milliliter
mm	Millimeter
mph	Miles per hour
ms	Millisecond
Nm	Newton-meter
OBC	Onboard charger
oz	Ounce

**Table 52. Acronyms and Measurement Symbols**

ITEM	DEFINITION
P&A	Parts and Accessories
PA	Public address
Part No.	Part number
PIN	Personal identification number
PPE	Personal protective equipment
psi	Pounds per square inch
PTT	Push to talk
qt	Quart
RESS	Rechargeable energy storage system
rpm	Revolutions per minute
SDS	Safety data sheet
SoC	State of charge
SoH	State of health
SW	Software
TCS	Traction control system
TCU	Telematic Control Unit
TPMS	Tire pressure monitoring system
USB	Universal serial bus
USB-C	Universal serial bus - type C
V	Volt
VAC	Volts of alternating current
VDC	Volts of direct current
VHC	Vehicle hold control
VIN	Vehicle identification number
VR	Voice recognition

**Table 52. Acronyms and Measurement Symbols**

<b>ITEM</b>	<b>DEFINITION</b>
W	Watt
WSS	Wheel speed sensor
Wh	Watt-hour
WHIM	Wireless Headset Interface Module

## **H-D U.S.A., LLC TRADEMARK INFORMATION**

Bar & Shield, Boom!, Breakout, Cruise Drive, CVO, Digital Tech, Digital Technician, Digital Technician II, Electra Glide, Evolution, Fat Bob, Fat Boy, Forty-Eight, FXDR 114, Glaze, Gloss, H-D, H-Dnet.com, Harley, Harley-Davidson, HD, Heritage Softail, Iron 1200, Iron 883, Low Rider, Milwaukee-Eight, Night Rod, Pan America, Profile, Reflex, Revolution X, Road Glide, Road King, Road Tech, Roadster, Screamin' Eagle, Seventy-Two, Slim, Softail, Sport Glide, Sportster, Street Bob, Street Glide, Street Rod, Sun Ray, Sunwash, SuperLow, Supersmart, SYN3, TechLink, TechLink II, TechLink 3, Tour-Pak, Tri Glide, Twin-Cooled, Ultra Classic, and Harley-Davidson Genuine Motor Parts and Genuine Motor Accessories are among the trademarks of H-D U.S.A., LLC.

## **PRODUCT REGISTERED MARKS**

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# NOTES

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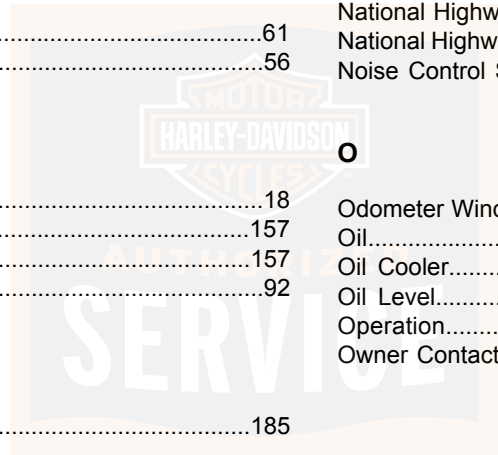
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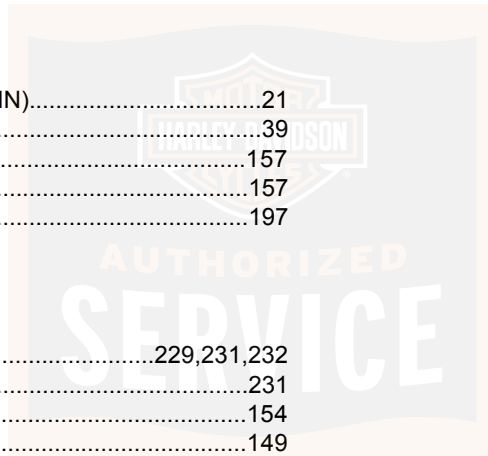
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OUTSIDE BACK COVER GOES HERE