# 2018 HARLEY-DAVIDSON® SERVICE MANUAL SUPPLEMENT: FLHTKSE MODELS

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This service manual supplement has been designed to be used with the current service manual. It has been prepared with two purposes in mind.

- It will acquaint the user with the Harley-Davidson product and assist in the performance of basic maintenance and repair.
- It provides the latest field-tested and factory-approved repair methods.

We sincerely believe that this service manual supplement will make your association with Harley-Davidson products more pleasant and profitable.

#### **NOTE**

This service manual supplement provides information unique to this model motorcycle. Any information not presented in this supplement can be found in the appropriate service manual or electrical diagnostic manual. Refer to **Table 1**.

Table 1. Relevant Model Year Publications

Touring Models Service Manual	94000451
Touring Models Electrical Diagnostic Manual	94000505

Use the TABLE OF CONTENTS (which follows this FOREWORD) and the INDEX (at the back of this manual) to quickly locate subjects. Sections and topics in this manual are sequentially numbered for easy navigation.

#### Generated list of chapters

For example, a cross-reference shown as **2.1 SPECIFICATIONS** refers to chapter 2 CHASSIS, heading 2.1 SPECIFICATIONS.

If the subject you seek is not in this supplement, refer to the corresponding chapter in the appropriate service manual. Check the title page located in the front of each chapter to find the subject.

For quick and easy reference, all pages contain a chapter number followed by a page number. For example, page 3-5 refers to page 5 in chapter 3.

In figure legends, the number following the name of a part indicates the quantity necessary for one complete assembly.

#### **Special Tools**

Description	Part Number	Qty.
DIGITAL TECHNICIAN II	HD-48650	1

#### 

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)

Good preparation is very important for efficient service work. Start each job with a clean work area. This will allow the repair to proceed as smoothly as possible. It will also reduce the incidence of misplaced tools and parts.

Clean a motorcycle that is excessively dirty before work starts. Cleaning will occasionally uncover sources of trouble. Gather any tools, instruments and any parts needed for the job before work begins. Interrupting a job to locate tools or parts is a distraction and causes needless delay.

#### NOTE

- To avoid unnecessary disassembly, carefully read all related service information before repair work begins.
- In figure legends, the number which follows the name of a part indicates the quantity necessary for one complete assembly.
- When servicing a vehicle equipped with the Harley-Davidson Smart Security System (H-DSSS), first disarm the system. Keep the fob close to the vehicle or use DIGITAL TECHNICIAN II (Part Number: HD-48650) to disable the system. Activate the system after service is completed.

In addition to the information presented in this service manual supplement and the appropriate service manual, Harley-Davidson Motor Company will periodically issue Service Bulletins to Harley-Davidson dealers. Service bulletins cover interim engineering changes and supplementary information. Consult the service bulletins to keep your product knowledge current and complete.

# **ℳ** 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)

To achieve satisfactory and lasting repairs, carefully follow the service manual instructions and use only genuine Harley-Davidson replacement parts. Behind the emblem bearing the words GENUINE HARLEY-DAVIDSON stand more than 100 years of design, research, manufacturing, testing and inspecting experience. This is your assurance that the parts you are using will fit right, operate properly and last longer.

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



#### 

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. It is recommended that you take special notice of these items.

Proper service and repair are important for the safe, reliable operation of all mechanical products. The service procedures recommended and described in this manual are effective methods for performing service operations.



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Always wear proper eye protection when using hammers, arbor or hydraulic presses, gear pullers, spring compressors, slide hammers and similar tools. Flying parts could result in death or serious injury. (00496b)

Some of these service operations require the use of tools specially designed for the purpose. These special tools should be used when and as recommended. It is important to note that some warnings against the use of specific service methods, which could damage the motorcycle or render it unsafe, are stated in this manual. However, remember that these warnings are not all-inclusive. Inadequate safety precautions could result in death or serious injury.

Since Harley-Davidson could not possibly know, evaluate or advise the service trade of all possible ways in which service might be performed, or of the possible hazardous consequences of each method, we have not undertaken any such broad evaluation. Accordingly, anyone who uses a service procedure or tool which is not recommended by Harley-Davidson must first thoroughly satisfy himself that neither his nor the operator's safety will be jeopardized as a result. Failure to do so could result in death or serious injury.

# **⚠** WARNING

Read and follow warnings and directions on all products. Failure to follow warnings and directions can result in death or serious injury. (00470b)

When reference is made in this manual to a specific brand name product, tool or instrument, an equivalent product, tool or instrument may be substituted.

All tools mentioned in this manual with a part number beginning with "HD", "J" or "B" must be ordered through your local Harley-Davidson dealer. Special tools may only be purchased, serviced or warrantied through a Harley-Davidson dealer.

Specific use of special tools is not discussed in this manual. Refer to the tool instruction sheet for instructions. If the tool instructions are misplaced, a copy can be obtained online at H-Dnet.com > My Toolbox > Edit > Bosch Tool Site.

Some procedures in this manual call for the use of LOCTITE products. If you have any questions regarding LOCTITE product usage or retailer/wholesaler locations, contact Loctite Corp. at www.loctite.com.

Apple, Alcantara S.p.A., Allen, Amp Multilock, Bluetooth, Brembo, City Navigator, Delphi, Deutsch, Dunlop, Dynojet, Fluke, G.E. Versilube, Garmin, Gunk, Hydroseal, Hylomar, iPhone, iPod, Kevlar, Lexan, Loctite, Lubriplate, Keps, K&N, Magnaflux, Marson Thread-Setter Tool Kit, MAXI fuse, Molex, Michelin, MPZ, Multilock, nano, NGK, Novus, Packard, Pirelli, Permatex, Philips, PJ1, Pozidriv, Road Tech, Robinair, S100, Sems, SiriusXM, Snap-on, Teflon, Threadlocker, Torca, Torco, TORX, Tufoil, Tyco, Ultratorch, Velcro, X-Acto and XM Satellite Radio are among the trademarks of their respective owners.

Bar & Shield, Boom!, Cross Bones, Cruise Drive, CVO, Digital Tech, Digital Technician, Digital Technician II, Dyna, Electra Glide, Evolution, Fat Bob, Fat Boy, Forty-Eight, Glaze, Gloss, H-D, H-Dnet.com, Harley, Harley-Davidson, HD, Heritage Softail, Iron 883, Low Rider, Milwaukee-Eight, Night Rod, Nightster, Night Train, Profile, Reflex, Revolution, Road Glide, Road King, Road Tech, Rocker, Screamin' Eagle, Seventy-Two, Softail, Sportster, Street Glide, Street Rod, Sun Ray, Sunwash, Super Glide, SuperLow, Supersmart, Switchback, SYN3, TechLink, TechLink II, Tour-Pak, Tri Glide, Twin Cam 88, Twin Cam 88B, Twin Cam 96, Twin Cam 103, Twin Cam 103B, Twin Cam 110, Twin Cam 110B, Twin-Cooled, Ultra Classic, V-Rod, VRSC and Harley-Davidson Genuine Motor Parts and Genuine Motor Accessories are among the trademarks of H-D U.S.A., LLC.

All photographs, illustrations and procedures may not necessarily depict the most current model or component, but are based on the latest production information available at the time of publication.

Since product improvement is our continual goal, Harley-Davidson reserves the right to change specifications, equipment or designs at any time without notice and without incurring obligation.

Air cleaner insert screw	3.1–3.6 N·m (27–32 <b>in-lbs</b> )	1.3 AIR FILTER ELEMENT, Install
Air filter element screws	5.6–6.8 N·m (50–60 <b>in-lbs</b> )	1.3 AIR FILTER ELEMENT, Install

The scheduled maintenance table in this section lists the maintenance requirements for this CVO model. Refer to **Table 1**. In addition to this supplement, see the service manual for service procedures.

Various lubricants, sealants and greases are recommended in certain service operations. Refer to **Table 2** for the appropriate part numbers for these items.

#### **NOTE**

This motorcycle uses SCREAMIN' EAGLE SYN3 FULL SYNTHETIC MOTORCYCLE LUBRICANT 20W50 in the engine, transmission and primary chaincase.

When servicing the motorcycle, properly recycle or dispose of all fluids, bulbs, batteries, filters and other scrap materials according to local regulations.

Table 1. Regular Service Intervals: Harley-Davidson FLHTKSE

Check operation of electrical equipment and switches	X	X	Х	Х	Х	Х	X	Х	Х	Х	Х
Check front tire pressure, inspect tread	X	X	X	X	X	X	X	X	X	X	X
Inspect front brake fluid level	Х	Х	X	Х	Х	X	X	Х	Х	X	X
Check DOT4 clutch fluid and front brake fluid for moisture	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х
Inspect clutch fluid system for leaks, contact or abrasion	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х

	1			ı	I	I	ı	1			
Check hand control fastener switch housing screw torque	x		X		х		х		X		Х
Check clutch lever bracket handlebar clamp screw torque	x		X		х		х		X		X
Check master cylinder handlebar clamp screw torque	x		X		х		X		Х		X
Inspect, lubricate and adjust steering head bearings						Х					×
Inspect air cleaner, service as required		Х	Х	х	х	х	х	х	Х	Х	Х
Replace engine oil and filter	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х
Check engine coolant freeze point, inspect for leaks	X	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х
Coolant				Replac	ce coolant	every 48,	,000 km (3	30000 mi)			
Clean radiators	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х
Replace primary	Х		Х		Х		Х		Х		Х

lubricant											
Replace transmission lubricant	X				Х				Х		
Inspect oil lines and brake system for leaks, contact or abrasion	Х	X	Х	Х	Х	Х	Х	Х	Х	Х	×
Inspect fuel lines and fittings for leaks, contact or abrasion	Х	х	Х	Х	Х	Х	Х	Х	Х	Х	Х
Inspect rear brake fluid level	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х
Check DOT 4 rear brake fluid for moisture	Х	Х	Х	х	х	Х	Х	х	х	Х	Х
Brake and clutch systems	Flus	sh brake				ace DOT 4 noisture c				luids ever	y two
Inspect brake pads and discs for wear	Х	х	Х	х	х	х	Х	х	х	Х	Х
Check front axle nut torque	Х		Х		Х		Х		Х		Х
Inspect and lubricate jiffy stand	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х
Check, adjust and lubricate (with HARLEY LUBE) brake and clutch	Х	х	Х	х	х	X	х	х	х	Х	Х

Check rear tire	Х	Х	X	X	X	X	Х	Х	X	X	х
pressure, inspect tread											
Inspect and adjust drive belt and sprockets	Х	Х	х	х	Х	х	Х	х	Х	Х	Х
Check rear axle nut torque	Х		X		X		X		X		Х
exhaust system for leaks, cracks and loose, or missing fasteners or exhaust shields	x	x	x	x	x	x	X	X	X	x	X
Battery	(	Check b	attery, teri			ean conne			bricate te	rminals wi	th
Spark Plugs	Re	place sp	ark plugs	every two	years or	every 30,	000 mi (4	8,000 km)	, whichev	er comes	first.
Lubricate Fuel door hinge and latch with HARLEY LUBE	х	х	Х	Х	Х	Х	Х	Х	Х	Х	X
Rebuild front forks											Х
Fuel filter		•		Replace	fuel filter	every 161	,000 km (	100000 m	i).		•
Rear	Inspect rear sprocket isolators for wear at each rear tire change.										
sprocket isolators				Х	Х	Х	Х	Х	Х	Х	Х

data and are mechanically qualified.

- 2. Disassemble, lubricate and inspect every 40,000 km (25000 mi).
- 3. Perform maintenance more frequently in severe riding conditions (such as extreme temperatures, c environments, mountainous or rough roads, long storage conditions, short runs, heavy stop/go traffic fuel quality).
- 4. For torque instructions, see Shop Practices in the service manual.
- 5. Disassemble, inspect, rebuild forks and replace fork oil every 80,000 km (50000 mi).
- 6. Perform annually or at specified intervals, whichever comes first.
- 7. Clutch fluid level will rise as clutch wears.

#### **NOTE**

Whenever a vehicle is in for maintenance:

- Always check for and complete open recalls and product programs.
- Always verify that the latest calibration is installed.

Table 2. Lubricants, Greases, Sealants

able 2. Lubricants, Greases, Sealants		T
3M 847 Adhesive	021200-19718 *	5 oz tube
3M General Purpose Adhesive Remover		15 oz aerosol
Anti-Seize Lubricant	98960-97	1 oz squeeze tube
CCI #20 Brake Grease	42830-05	squeeze packet
DOT 4 Brake Fluid	99953-99A	12 oz bottle
Dow Corning Moly 44 Grease	94674-99	2 cc packet
Electrical Contact Lubricant	11300004	1 oz squeeze tube
Formula+ Transmission and Primary Chaincase Lubricant	99851-05	1 qt bottle
G40M Brake Grease	42820-04	squeeze packet
Genuine Harley-Davidson Extended Life Antifreeze and Coolant	99822-02	1 gal container
Genuine Harley-Davidson H-D 360 20W50 Motorcycle Oil	99816- 2050/00QT	1 qt bottle
Harley-Davidson Adhesive (Griplock)	99839-95	10 g tube
Harley-Davidson High Performance Sealant - Gray	99650-02	1.9 oz squeeze tube
Harley-Davidson Leather Dressing	98261-91V	6 oz can
Harley-Davidson Seal Grease	11300005	1 oz tube

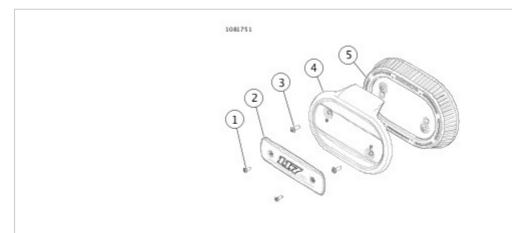
Harley Lube	94968-09	1/4 oz needle dispenser
Hylomar Gasket and Thread Sealant	99653-85	3.0 oz tube
Loctite 222 Low Strength Threadlocker and Sealant (purple)	99811-97	6 mL tube
Loctite 243 Medium Strength Threadlocker and Sealant (blue)	99642-97	6 mL tube
	11100005	50 mL bottle
Loctite 246 Medium Strength/High Temperature Threadlocker (blue)		
Loctite 262 High Strength Threadlocker and Sealant (red)	94759-99	6 mL tube
Loctite 271 High Strength Threadlocker and Sealant (red)		6 mL tube
	11100006	50 mL bottle
Loctite 411 Prism Instant Adhesive		
Loctite 420 Super Bonder Adhesive		
Loctite 565 Thread Sealant	99818-97	6 mL tube
Loctite 770 Prism Primer		
Loctite 7649 Cleaner/Primer	98968-99	1.75 oz bottle
PJ1 Super Cleaner99878-87TA	98968-99	13 oz aerosol can
Screamin' Eagle Assembly Lube	11300002	4 oz tube
Screamin' Eagle SYN3 Full Synthetic Motorcycle Lubricant 20W50	99824-03/00QT	1 qt bottle
Special Purpose Grease	99857-97A	14 oz cartridge
Type "E" Hydraulic Fork Oil	62600026	16 oz bottle
Wheel Bearing Grease	99855-89	1 lb can
	99856-92	14 oz cartridge
* Not a Harley-Davidson part number		•

For Asia-Pacific air filter assembly, see the service manual.

### NOTE

For air filter element cleaning information, see service manual.

- 1. See Figure 1. Remove screws (1) and air cleaner insert (2).
- 2. Remove screws (3).
- 3. Remove air cleaner cover (4) and air filter element (5).



1	Screw (2)
2	Insert
3	Screw (2)
4	Cover
5	Air filter element

Figure 1. Air Filter Element

- 1. See Air Filter Element. Install air filter element (5).
  - a. Apply LOCTITE 243 MEDIUM STRENGTH
     THREADLOCKER AND SEALANT (blue) to screws
     (3).
  - b. Secure air filter element (5) and cover (4) with screws (3).
  - c. Tighten to 5.6–6.8 N·m (50–60 **in-lbs**).
- 2. Install insert (2).
  - a. Secure insert with screws (1).
  - b. Tighten to 3.1–3.6 N·m (27–32 **in-lbs**).

# **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)

The procedures to change lubricants and check levels is the same as OE vehicles except the recommended lubricants. See the service manual.

SCREAMIN' EAGLE SYN3 FULL SYNTHETIC MOTORCYCLE LUBRICANT 20W50 is recommended for engine, transmission and primary chaincase lubrication.

If SYN3 is not available, use GENUINE HARLEY-DAVIDSON H-D 360 20W50 MOTORCYCLE OIL. Although H-D 360 is compatible with SYN3, we suggest the mixture of fluids be changed as soon as possible.

If H-D 360 is not available, the third choice is an oil certified for diesel engines. **DO NOT add diesel engine oil to the primary chaincase or transmission.** Acceptable diesel engine oil designations include: CH-4, CI-4 and CJ-4. The preferred viscosities for diesel engine oils, in descending order are: 20W50, 15W40 and 10W40.

We again suggest the mixture of the fluids be changed as soon as possible. At the first opportunity, see a Harley-Davidson dealer to change back to 100 percent Harley-Davidson oil.

To switch lubricant to H-D 360, completely drain the SYN3 before filling with H-D 360. It is not required to flush out any residual lubricant. Refer to **Table 1**.

Table 1. Recommended Engine Oils

Screamin' Eagle SYN3 Full Synthetic Motorcycle Lubricant	SAE 20W50	HD 360	Above -1 °C (30.2 °F)	Excellent
Genuine Harley-Davidson H-D 360 Motorcycle Oil	SAE 20W50	HD 360	Above 4 °C (39.2 °F)	Good
Genuine Harley-Davidson H-D 360 Motorcycle Oil	SAE 50	HD 360	Above 16 °C (60.8 °F)	Poor
Genuine Harley-Davidson H-D 360 Motorcycle Oil	SAE 60	HD 360	Above 27 °C (80.6 °F)	Poor

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

- Increase preload to accommodate the total load on the motorcycle.
- Reduce the preload if carrying less weight.
  - 1. Remove the left saddlebag.
  - 2. See **Figure 1**. Rotate the preload adjustment knob counterclockwise until it stops. This is the minimum preload position.

#### NOTE

Each line on the adjustment decal represents approximately 5 full turns.

- 3. Refer to **Table 1**. Rotate the knob clockwise the recommended number of turns for the total weight of the rider plus the passenger and cargo. The knob will click after each half turn.
- 4. Turn the knob half turns to fine tune the ride if desired.
- 5. Install the left saddlebag.

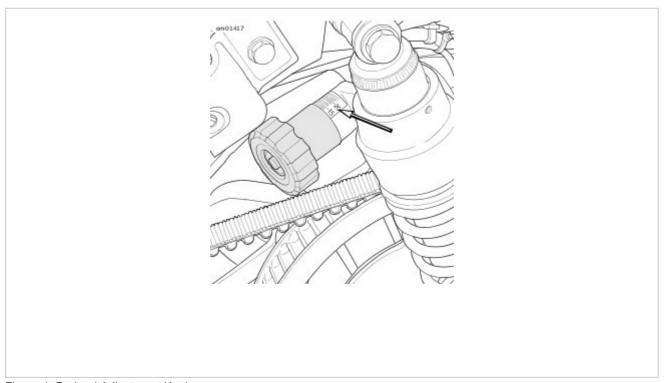


Figure 1. Preload Adjustment Knob

Table 1. Suspension Preload Table: Standard Length Shocks, with Tour-Pak

Table I	. Ousp	CHSIOH	Fision Freidad Table. Standard Length Shocks, with Tour-Fak															
		LB	0	10	20	30	40	50	60	70	80	90	100	110	120	130	140	150
		KG	0	5	9	14	18	23	27	32	36	41	45	50	54	59	64	68
RIDER WEIGHT																		
LB	KG			Full Turns of Knob														
150	68		0	0	0	1	2	3	4	5	6	6	7	8	9	10	11	12

160	73	0	0	0	1	2	3	4	5	6	7	8	9	10	11	12	13	
170	77	0	0	1	2	3	4	5	6	7	8	9	10	10	11	12	13	
180	82	0	1	2	3	4	4	5	6	7	8	9	10	11	12	13	14	
190	86	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	14	
200	91	1	2	3	4	5	6	7	8	9	9	10	11	12	13	14	15	
210	95	2	3	3	4	5	6	7	8	9	10	11	12	13	14	15	16	
220	100	2	3	4	5	6	7	8	9	10	11	12	13	13	14	15	16	
230	104	3	4	5	6	7	7	8	9	10	11	12	13	14	15	16	17	
240	109	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	17	
250	113	4	5	6	7	8	9	10	11	12	12	13	14	15	16	17	18	
260	118	5	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	
270	123	5	6	7	8	9	10	11	12	13	14	15	16	16	17	18	19	

		-
Axle cover set screw	6.8–9.5 N·m (60–84 <b>in-lbs</b> )	2.4 FRONT AXLE COVERS, Replacement
		LOCTITE 262 HIGH STRENGTH THREADLOCKER AND SEALANT (red)
Backrest bracket support strap, rider	14.9–20.3 N·m (132–180 <b>in-lbs</b> )	2.11 RIDER BACKREST, Adjusting Front to Rear
Backrest bracket, rider	6.8–10.8 N·m (60–96 <b>in-lbs</b> )	2.11 RIDER BACKREST, Adjusting Front to Rear
Backrest mounting bracket screw, rider	6.8–10.8 N·m (60–96 <b>in-lbs</b> )	2.11 RIDER BACKREST, Adjusting Front to Rear
Brake disc screws, front	21.7–32.5 N·m (16–24 ft-lbs)	2.5 WHEELS, Front Brake Disc
Brake pedal cover screws	16.2–20.3 N·m (12–15 ft-lbs)	2.8 FOOTBOARDS AND CONTROLS, Rear Brake Pedal Pad
Footboard bracket screws, rider	48.8–57 N·m (36–42 ft-lbs)	2.8 FOOTBOARDS AND CONTROLS, Rider Footboards
Footboard pivot bolt nut, rider	6.8–9 N·m (60–80 <b>in-lbs</b> )	2.8 FOOTBOARDS AND CONTROLS, Rider Footboards
Footboard wear peg	5.4–8.1 N·m (48–72 <b>in-lbs</b> )	2.8 FOOTBOARDS AND CONTROLS, Rider Footboards
Handlebar switch housing screws	4.9–5.1 N·m (35–45 <b>in-lbs</b> )	2.7 HAND GRIPS, Left Hand Grip
Highway peg end screw	25.8 N·m	2.9 HIGHWAY PEGS, Assembly
	(19 ft-lbs)	Apply LOCTITE 243 MEDIUM STRENGTH THREADLOCKER AND SEALANT (blue).
Highway peg mounting screws	19 N·m (14 ft-lbs)	2.9 HIGHWAY PEGS, Installing Clamp
Highway peg nut	16.2–20.4 N·m (12–15 ft-lbs)	2.9 HIGHWAY PEGS, Assembly
Passenger footboard mounting adjustment bolts	34–41 N·m (25–30 ft-lbs)	2.8 FOOTBOARDS AND CONTROLS, Adjustable Passenger Footboards
Passenger footboard mounting arm lower screw	5.4–8.1 N·m (48–72 <b>in-lbs</b> )	2.8 FOOTBOARDS AND CONTROLS, Adjustable Passenger Footboards

Passenger footboard mounting arm upper screw	48.8–57 N·m (36–42 ft-lbs)	2.8 FOOTBOARDS AND CONTROLS, Adjustable Passenger Footboards	
Saddlebag face plate screws	4.5–5.1 N·m (40–45 <b>in-lbs</b> )	2.12 SADDLEBAGS, Lock	
Saddlebag filler strip screw	6.8–10.8 N·m (60–96 <b>in-lbs</b> )	2.13 SADDLEBAG SUPPORTS, Installation	
Saddlebag lock screws	2.3–3.4 N·m (20–30 <b>in-lbs</b> )	2.12 SADDLEBAGS, Lock	
Seat mounting screw	5.4–8.1 N·m (48–72 <b>in-lbs</b> )	2.10 SEAT, Installation	
Seat strap screw	5.4–8.1 N·m (48–72 <b>in-lbs</b> )	2.10 SEAT, Installation	
Shift lever clamp screws	24.4–29.8 N·m (18–22 ft-lbs)	2.8 FOOTBOARDS AND CONTROLS, Shift Levers	
Shift lever peg fastener	19–21.7 N·m (14–16 ft-lbs)	2.8 FOOTBOARDS AND CONTROLS, Shift Levers	
Support tube to support casting screw	20.4–27.1 N·m (15–20 ft-lbs)	2.13 SADDLEBAG SUPPORTS, Installation	
Tour-Pak lock cover plate screw	2.8–4 N·m (25–35 <b>in-lbs</b> )	2.14 TOUR-PAK, Tour-Pak Lock Cover Plate	
Tour-Pak luggage rack fastener	6.8–9.5 N·m (60–84 <b>in-lbs</b> )	2.14 TOUR-PAK, Luggage Rack	
Tour-Pak tether anchor screws	1.8–2.5 N·m (16–22 <b>in-lbs</b> )	2.14 TOUR-PAK, Tour-Pak Bottom Liner	
Valve stem, 90 degree with sensor	6–7 N·m (54–62 <b>in-lbs</b> )	2.5 WHEELS, Tire Pressure Monitoring System (TPMS)	

Table 1. Dimensions

Overall length	102.4	2600			
Overall width	42.9	1090			
Overall height	56.7	1440			
Wheelbase	64.0	1625			
Road clearance	5.3	135			
Seat height*	28.4	720			
* With 81.7 kg (180 lb) rider on seat.					

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

The maximum additional weight allowed on the motorcycle equals the Gross Vehicle Weight Rating (GVWR) minus the running weight. For example, a motorcycle with GVWR of 544 kg (1,200 lb) having a running weight of 363 kg (800 lb), would allow a maximum of an additional 181 kg (400 lb) combined weight of the rider, passenger, riding gear, cargo and installed accessories.

Table 2. Weights

Running weight *	950	431
Maximum additional weight allowed **	410	186
GVWR	1360	617
GAWR front	500	227
GAWR rear	927	420

<sup>\*</sup> The total weight of the motorcycle as delivered with all oil/fluids and approximately 90% of fuel.

<sup>\*\*</sup> The total weight of accessories, cargo, riding gear, passenger and rider must not exceed this weight.

Table 3. Capacities

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				
Service oil change	4.75 qt	4.5 L				
Transmission ** (approximate)	32 oz	0.95 L				
Primary chaincase (dry fill; approximate) ***	34 oz	1.0 L				
Coolant, Twin-Cooled models (approximate)	0.8 qt	0.8 L				

<sup>\*</sup> When refilling, initially add 3.8 L (4.0 qt). Add more as needed to bring level within specification.

# **⚠** 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)

#### **NOTE**

Harley-Davidson does not perform any testing with 100 percent nitrogen in tires. Harley-Davidson neither recommends nor discourages the use of pure nitrogen to inflate tires.

Table 4. Specified Tires

Front	17 in	Dunlop D408F 130/80B17 M/C 65H	36	248
Rear	16 in	Dunlop D407T 180/65B16 M/C 81H	40	276

- Tire pressures vary with changes in ambient and tire temperature. Check pressure with tires cold (20 °C (68 °F)). Increase tire pressure by 6.9 kPa (1 psi) for every 5.6 °C (10 °F) in ambient air temperature above this point.
- Do not use the TPMS as a pressure gauge when adding or removing air from a tire. Sensor data is sent to the TPMS at varying intervals which does not refresh immediately when adding or removing air from the tire. Over-

<sup>\*\*</sup> When refilling, initially add 0.8 L (28 fl oz)Add more as needed to bring level within specification.

<sup>\*\*\*</sup> Amount is approximate. Fill to bottom of pressure plate OD with vehicle upright.

inflation or under-inflation can result.

- The TPMS sensor will not communicate pressures above 345–414 kPa (50.0–60.0 psi) depending on altitude.
- Air is used to calibrate the TPMS. Use of 100 percent nitrogen does affect the accuracy of the system.
- Do not rotate valve stems from their properly installed position. Can affect the valve stem seal and result in a slow
- Do not use liquid tire balancers or sealing agents in wheels with a TPMS sensor. Damage to the sensor can result.

If tire pressure is checked when the vehicle has been recently ridden and the tires are warm, refer to **Table 5** to determine corrected pressures. If warm tire pressure is adjusted per **Table 5**, readjust per **Table 4** recommendation at the earliest convenience.

Table 5. Tire Pressure Adjustment

Tire pressure adjustment above published cold pressure (PSI).  If warm tire pressure is adjusted per this table, readjust per cold tire recommendation at the earliest convenience.	12 10 2 2 0 4 4 2 0 4 58 68 68 108 118
	Air Temperature °F
1	Vehicle cold (not ridden for three or more hours)
2	Vehicle warm (ridden within 1-2 hours)
3	Vehicle hot (ridden over one hour recently)

See **Figure 2**. A unique 17-digit serial or Vehicle Identification Number (VIN) is assigned to each motorcycle. For a description of each item in the VIN, refer to **Table 1**.

See **Figure 1**. The full 17-digit VIN (1) is stamped on the right side of the frame near the steering head. In some destinations, a printed VIN label (2) is also attached to the front downtube.

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 the motorcycle.



1	Stamped VIN
2	VIN label

Figure 1. VIN Locations

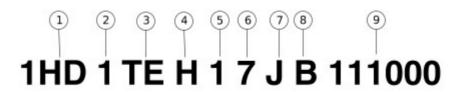


Figure 2. Typical Harley-Davidson VIN: 2018 FLHTKSE

Table 1. Harley-Davidson VIN Breakdown: 2018 FI HTKSF

Table 1. Harie	y-Davidson VIN Breakdown: 201 T	8 FLHTKSE			
1	World manufacturer identifier	1HD=Originally manufactured in the United States 5HD=Originally manufactured in the United States for sale outside of the United States 932=Originally manufactured in Brazil MEG=Originally manufactured in India			
2	Motorcycle type	1=Heavyweight motorcycl	e (901 cm <sup>3</sup> or larger)		
3	Model	TE=FLHTKSE CVO <sup>®</sup> Limited; TH=FLHTKSEANV CVO <sup>®</sup> Limited Anniversary			
4	Engine type H=Twin-Cooled™ Milwaukee-Eight™ 117 Engine, 1917 cm³				
5	Calibration/configuration, introduction	Normal Introduction 1=Domestic (DOM) 3=California (CAL) A=Canada (CAN) C=HDI E=Japan (JPN) G=Australia (AUS) J=Brazil (BRZ) L=Asia Pacific (APC) N=India (IND)	Mid-year or Special Introduction 2, 4=Domestic (DOM) 5, 6=California (CAL) B=Canada (CAN) D=HDI F=Japan (JPN) H=Australia (AUS) K=Brazil (BRZ) M=Asia Pacific (APC) P=India (IND)		
6	VIN check digit	Can be 0-9 or X			
7	Model year	J=2018			
8	Assembly plant	B=York, PA USA D=H-D Brazil-Manaus, Brazil (CKD) N=Haryana India (Bawal District Rewari)			
9	Sequential number	Varies			

- 1. See Figure 1. Loosen set screw. Remove cover.
- 2. Remove set screw from cover.
- Liberally apply LOCTITE 262 HIGH STRENGTH THREADLOCKER AND SEALANT (red) to set screw threads.

Install cover over axle end with set screw on the bottom. Tighten set screw against a flat on the axle nut

- 4. Install cover with set screw. Tighten to 6.8–9.5 N⋅m (60–84 in-lbs).
- 5. Repeat steps for the opposite side.

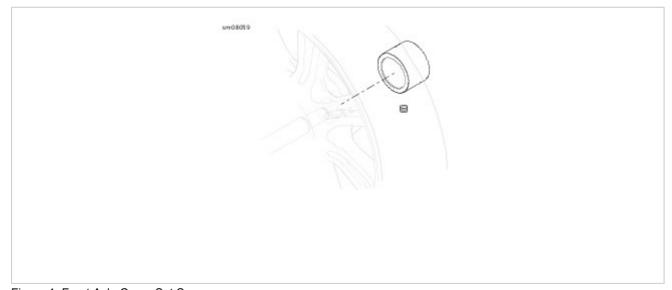


Figure 1. Front Axle Cover Set Screw

Front wheel service procedures are similar to other models with the following exceptions.

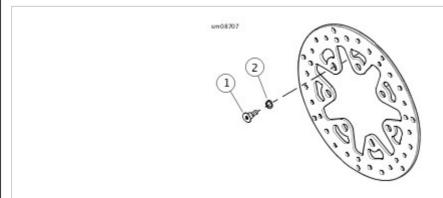
- 1. Remove wheel. See service manual.
- See Figure 1. Remove screws (1) and spring washers

   (2) securing brake disc to the wheel. Repeat procedure
   to remove disc on opposite side of wheel. Discard
   screws and spring washers.

### NOTE

Install spring washers between brake disc and head of screws.

3. Install **new** brake disc with **new** screws and spring washers. Tighten to 21.7–32.5 N⋅m (16–24 ft-lbs).



1	Screw (7)
2	Wave washer (7)

Figure 1. Brake Disc

#### **Special Tools**

Description	Part Number	Qty.
DIGITAL TECHNICIAN II	HD-48650	1
TPMS ACTIVATION TOOL	HD-51794	1

Sensors mounted in each tire measure and report tire pressure data to the BCM. The BCM monitors the data and displays each tire pressure both in the Boom! Audio system information screen as well as in the odometer trip display. See **Description and Operation** for more information and diagnostics.

### NOTE

- Do not use the TPMS as a pressure gauge when adding or removing air from a tire. Sensor transmissions vary with conditions and may not react immediately when adding or removing air from the tire. Over-inflation or under-inflation can result.
- The TPMS sensor will not communicate pressures above 345–414 kPa (50–60 psi) depending on altitude.
- TPMS has been calibrated to use air in the tire. Use of 100% nitrogen may affect the accuracy of the system.
  - 1. Dismount tire. See Tire Replacement in this section.
- 2. See Figure 1. Remove nut (5).
- 3. Remove sensor (4) and spring (3) from valve stem.
- 4. Remove valve stem (1) from wheel. Discard valve stem.

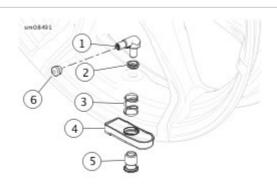
### **NOTE**

- Tire pressure sensors are designed for use with the wheels specified for the motorcycle. Attempting to use sensors on other wheels can result in lack of proper fitment, TPMS malfunction and air leakage.
- Sensors with good batteries can be reused.
- Never install a used valve stem or valve stem nut.
- See Figure 1. New valve stem (1) has pre-applied threadlocker and includes new seal (2).
- 1. Install new valve stem/seal assembly in wheel.
  - a. Install sensor and spring with nut (5). Position valve stem to face right side when wheel is installed.
  - b. Align sensor so that it does not touch the wheel.

- c. Do not allow sensor to contact the wheel while tightening. While holding valve stem aligned with wheel, tighten to 6–7 N·m (54–62 **in-lbs**).
- d. Do not attempt to rotate valve stem once it is installed on wheel.
- 2. Install the tire. See Tire Replacement in this section.

The sensor must be in PARK mode (have been at rest for approximately 7 minutes) to assign to the vehicle. This includes spin balancing or riding the motorcycle.

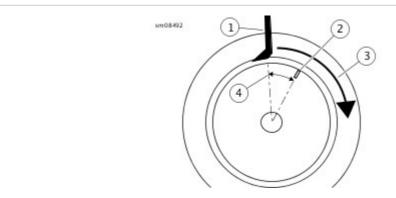
- New sensor: Before riding motorcycle, assign using TPMS ACTIVATION TOOL (Part Number:HD-51794) with DIGITAL TECHNICIAN II (Part Number:HD-48650).
  - a. Connect Digital Technician II to vehicle.
  - b. Go to Toolbox > Vehicle Setup > TPMS > Configure. Select sensor assignment.
  - c. Follow the online instructions to configure system to recognize sensors.



1	Valve stem
2	Seal
3	Spring
4	Sensor
5	Nut
6	Сар

Figure 1. Sensor and Valve Stem

- Wheels equipped with tire pressure sensors require special tire mounting and dismounting procedures.
   Failure to follow these procedures results in damaged sensors.
- Never allow tire machine spoon, tire iron or tire bead to contact sensor. Sensor damage will occur.
- 1. Break the bead being careful to not damage tire pressure sensor.
- 2. See **Figure 2**. Engage tire machine spoon (1) 30 degrees (4) from the valve stem (2) in the direction of tire machine rotation (3).
- 3. While rotating wheel away from the valve stem, remove the first bead.
- 4. Repeat with remaining bead. Remove tire.
- 5. Install tire on wheel. Start the first bead opposite from the valve stem.
- 6. Install first bead.
- 7. Engage the second bead 30 degrees from the valve stem in the direction of machine rotation.
- 8. While rotating away from the valve stem, install the second bead.
- 9. Inflate to the correct pressure. Refer to Specified Tires.



1	Tire machine spoon
2	Valve stem
3	Tire machine rotation
4	30 degrees

Figure 2. Tire Machine Operation

Handlebar servicing is essentially the same as the Remove for servicing the dash panel.	e Touring models excep	ot removal and installatio	on of the dash panel. See

Remove grip using the appropriate procedure. See the service manual.

Install grip using the appropriate procedure. See the service manual with the following exceptions:

1. Visually align the right grip with the left grip.

### **NOTE**

- See Figure 1. Center the switch housing split-line between the alignment dimples in the handlebar.
- To prevent damage to wire leads, do not rotate housings and switch assembly beyond alignment dimples.
- 2. Loosely install right switch control housing and front brake master cylinder. See the service manual.

### NOTE

Any gap between the switch housings should be on the bottom.

3. See the service manual to complete installation and adjust throttle grip end play.

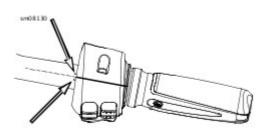


Figure 1. Alignment Dimples

Access the heated grip connectors. See **Remove**. Remove grip using the appropriate procedure. See the service manual.

Install grip using the appropriate procedure. See the service manual with the following exceptions:

### **NOTE**

See **Figure 3**. To prevent damage to wire leads, do not rotate grip sleeve, switch assembly and housings beyond the range of the alignment dimples.

- 1. See Figure 1. Fit the grip rubber step to the notch in the switch assembly.
- 2. Loosely install the switch assembly housings.
- 3. See Figure 2. Rotate the grip in the housing to engage the switch housing locking tooth to the rubber sleeve.



Figure 1. Sleeve Rubber Step to Switch Assembly Notch



Figure 2. Glueless Grip Sleeve Locking Tooth

1. See **Figure 3**. Hold the grip, switch assembly and housings locked together. Rotate the assembly to center the switch housing split-line between the alignment dimples in the handlebar.

### **NOTE**

Verify that gap between the switch housings is on the bottom.

- 2. Tighten the switch housing screws in the following order to 4.9–5.1 N·m (35–45 in-lbs):
  - a. Upper switch housing screw
  - b. Lower switch housing screw
- 3. See the service manual to complete installation.
- 4. Complete assembly. See Remove.



Figure 3. Alignment Dimples

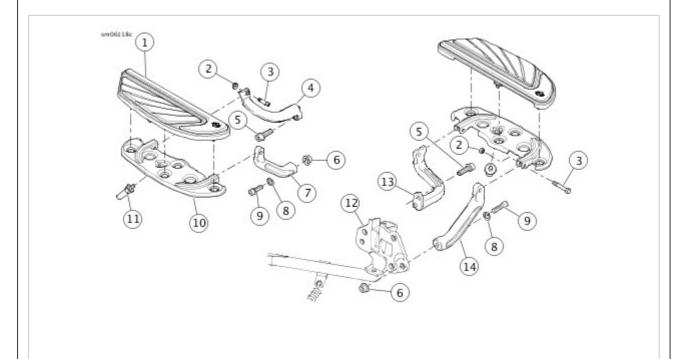
### **NOTICE**

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)

### **NOTE**

Left side footboard fasteners also secure the jiffy stand bracket.

- 1. See **Figure 1**. If removing left rear bracket (13), raise motorcycle using a suitable lift to remove weight from jiffy stand.
- 2. Remove screw (5).
- 3. Remove locknut (6), lockwasher (8) and screw (9).
- 4. Remove footboard and bracket assembly.
- 1. See Figure 1. Install footboard and bracket assembly.
- 2. Install screw (5).
- 3. Install screw (9), lockwasher (8) and locknut (6).
- 4. Tighten fasteners to 48.8–57 N·m (36–42 ft-lbs).



Rubber pad

2	Pivot screw locknut (2)
3	Pivot screw (2)
4	Right rear bracket
5	Screw (2)
6	Locknut (2)
7	Right forward bracket
8	Lockwasher (2)
9	Screw (2)
10	Footboard
11	Wear peg
12	Jiffy stand bracket
13	Left rear bracket
14	Left forward bracket

Figure 1. Rider Footboards (Typical) (Quantities shown are for each footboard)

If only replacing the rubber pad, refer to step 1, then perform steps 4-5 under ASSEMBLY.

- 1. Tilt footboard up. From bottom of footboard, push rubber pad anchors up through holes in footboard.
- 2. See Figure 1. Remove locknuts (2) and pivot screws (3) from bottom of footboard.
- 3. Remove footboard from brackets.
- 4. If necessary, remove wear peg (11).
- 1. See **Figure 1**. If removed, install wear peg (11). Tighten to 5.4–8.1 N·m (48–72 **in-lbs**).
- 2. Align footboard between brackets. Install pivot screws (3) with locknuts (2) positioned on inboard side.
- 3. Install locknuts (2) onto pivot screws. Tighten to 6.8–9 N·m (60–80 **in-lbs**).
- 4. Moisten rubber anchors on bottom of **new** pad (1) with soapy water.
- 5. Align pad on footboard. From bottom of footboard, pull

rubber anchors through holes in footboard.

 See Figure 1. Remove fastener (6). Remove shift lever peg assembly (5) and sleeve (4) along with lockwasher (7).

#### NOTE

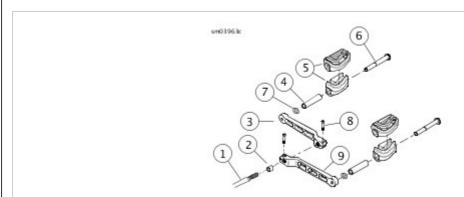
Insert lockwasher between sleeve and shift lever.

- 2. Insert sleeve (4), lockwasher (7) and fasten to shifter peg assembly (5) with fastener (6).
- 3. Rotate pegs for rider posture. Tighten to 19–21.7 N·m (14–16 ft-lbs).
- 1. Mark location of levers relative to splined shaft using a permanent marker.
- 2. See **Figure 1**. Remove clamp screws (8) from both levers (3, 9).
- 3. Pull shift levers and spacer (2) off splined shaft (1).

### NOTE

Install longer shift lever to the rear.

- 4. Align marks made during disassembly and position shift levers on splined shaft, or adjust for rider comfort.
- 5. Tighten clamp screws to 24.4–29.8 N·m (18–22 ft-lbs).



1	Splined shaft

2	Spacer
3	Heel shift lever
4	Sleeve
5	Shifter peg assembly
6	Fastener
7	Lockwasher
8	Clamp screw (2)
9	Toe shift lever

Figure 1. Shift Levers and Pegs

See the service manual for foot brake lever or linkage.

- 1. See **Figure 1**. Remove fastener (5) and offset washer (4). Remove brake pedal rubber pad (3) with cover (2).
- 2. Assemble chrome cover (2) and rubber pad (3).
- Secure assembly to foot brake lever (1) with offset washer
   (4) and fastener (5). Tighten to 16.2–20.3 N⋅m (12–15 ft-lbs).

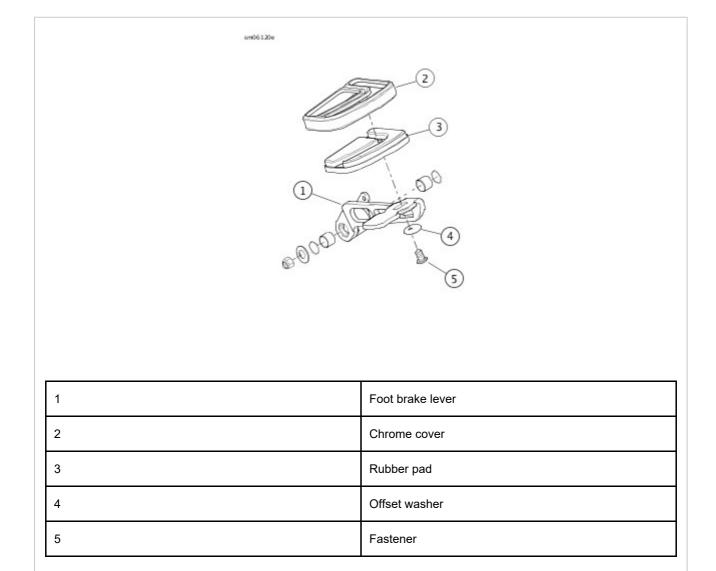
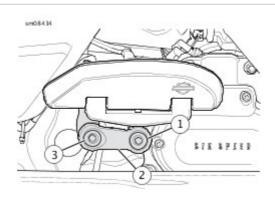


Figure 1. Rear Brake Pedal

- 1. See Figure 1. Remove the upper adjustment bolt (1), wave spring and footboard assembly.
- 2. Remove the lower adjustment bolt (3), wave spring and rotating arm (2).
- 1. Pull rubber insert out of footboard.
- 2. See Figure 2. Remove pivot pins.
- 3. See Figure 3. Retain ball (3) and spring (1) from hole (2) in support.



1	Upper adjustment bolt
2	Rotating arm
3	Lower adjustment bolt

Figure 1. Passenger Footboard Adjustment Bolts

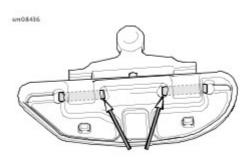
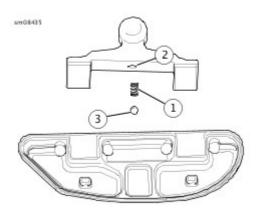


Figure 2. Pivot Pins

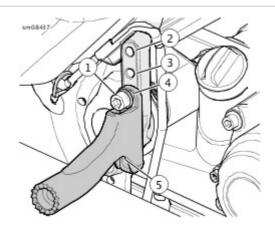


1	Spring
2	Hole
3	Ball

Figure 3. Support and Footboard

- 1. See Figure 3. Install spring (1) into hole (2). Install ball (3) on top of spring.
- 2. Attach the support to the footboard.
- 3. See Figure 2. Install pivot pins.
- 4. Moisten mounting points of rubber insert with soapy water. Install insert.
- 1. See Figure 1. Install rotating arm (2) and lower adjustment bolt (3) with wave spring.
- 2. Install footboard assembly and upper adjustment bolt (1) with wave spring.
- 1. Adjust height:
  - a. See Figure 4. Remove screw (1).
  - b. Slide mounting arm to desired height.
  - c. Install screw (1) through mounting arm and into one of the adjustment holes (2-4). Tighten to 48.8–57 N·m (36–42 ft-lbs).
  - d. Shoulder bolt located in slot (5) is not normally removed. If removed, tighten to 5.4–8.1 N·m (48–72 in-lbs).
- 2. Adjust angle:

- a. See Figure 1. Loosen adjustment bolts (1, 3).
- b. Rotate assembly until desired angle is achieved. Tighten to 34–41 N·m (25–30 ft-lbs).

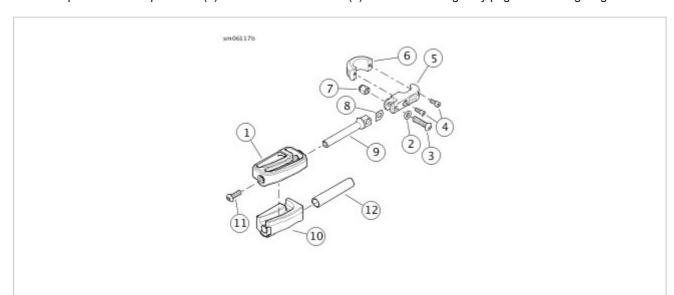


1	Screw
2	Top adjustment hole
3	Middle adjustment hole
4	Lower adjustment hole
5	Shoulder bolt slot

Figure 4. Height Adjustment

- 1. See **Highway Peg**. Remove the end screw (11). Slide the mounting peg with footpeg body (1) off the mounting peg (9).
- 2. Push the footpeg tread (10) out of the footpeg body.
- 3. Remove the pivot screw (3), washer (2) and nut (7).
- 4. Remove the mounting peg (9) and spring washer (8). Save the spring washer.

- 1. See Figure 1. Remove the clamp screws (4).
- 2. Separate the clamp bracket (6) from the mount bracket (5) to remove the highway peg from the engine guard.

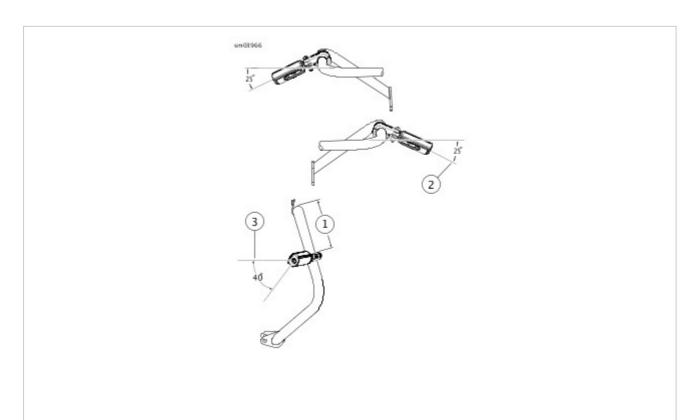


1	Footpeg body
2	Washer
3	Pivot screw
4	Clamp screws (2)
5	Mount bracket
6	Clamp bracket
7	Nut
8	Spring washer
9	Mounting peg
10	Footpeg tread
11	End screw
12	Spacer (2)

Figure 1. Highway Peg

- See Clamp and Mount Brackets. Match the flare (1) of the clamp bracket to the bevel (2) of the mount bracket.
- Position the highway pegs with the pivot screw and the two bracket clamp fasteners facing forward and the decorative nut facing the rider.
- Do not position the highway pegs so that the mounting brackets contact the lower fairings.
- See Highway Peg Mounting. Use a grease pencil to draw a line (1) on engine guard 165 mm (6.5 in) from top of upper rail.
- 2. Clamp the brackets to the engine guard just below the line with the brackets at a 25 degrees angle rearward (2).
- 3. Tighten the clamp screws to 19 N·m (14 ft-lbs).
- 4. Remove grease pencil mark.

- See Highway Peg. Apply LOCTITE 243 MEDIUM STRENGTH THREADLOCKER AND SEALANT (blue) to the end threads of the pivot screw (3).
- 2. With the square edge of spring washer (8) facing outward, hold the spring washer to the pivot hole of the mounting peg (9).
- Position the round edge of the mounting peg (9) upward. Install with the pivot screw (3), washer (2) and nut (7). Tighten to 16.2–20.4 N·m (12–15 ft-lbs).
- 4. Fit the rubber pad (10) to the chrome housing (1) and squeeze the rubber pad into the housing.
- 5. Slide the chrome housing and rubber pad onto the mounting peg.
- Apply LOCTITE 243 MEDIUM STRENGTH
   THREADLOCKER AND SEALANT (blue) to end screw
   (11).
- 7. See **Figure 1**. Rotate footpeg approximately 40 degrees (3) from horizontal. Tighten to 25.8 N·m (19 ft-lbs).



1	6.5 in (165 mm)
2	25 degrees
3	40 degrees

Figure 1. Highway Peg Mounting

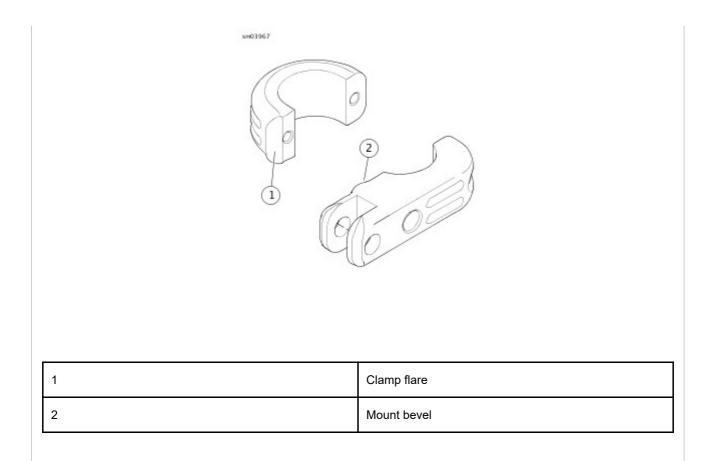


Figure 2. Clamp and Mount Brackets

This model has a heated seat. Individual controls, mounted on left side of seat, regulate warmth to the rider seat and passenger pillion separately. For electrical diagnostics, see **Description and Operation**.

# NOTE

Heater elements are not serviceable. Replace seat if heater fails.

### **NOTICE**

Detach passenger seat strap before removing seat. Failure to do so can result in damage to rear fender paint. (00225a)

- 1. See Figure 1. Open saddlebag cover. Remove seat strap screw (1) from seat strap (2).
- 2. Pull upward on strap to free it from slot in bracket. Move passenger seat strap to side of seat.
- 3. Remove seat screw (3) to detach seat mounting bracket from top of rear fender.
- 4. See Figure 2. Push seat rearward to free tongue from slot in the seat.
- 5. See Figure 3. Separate the seat connector half from the power connector half (1).
- 6. Remove seat.

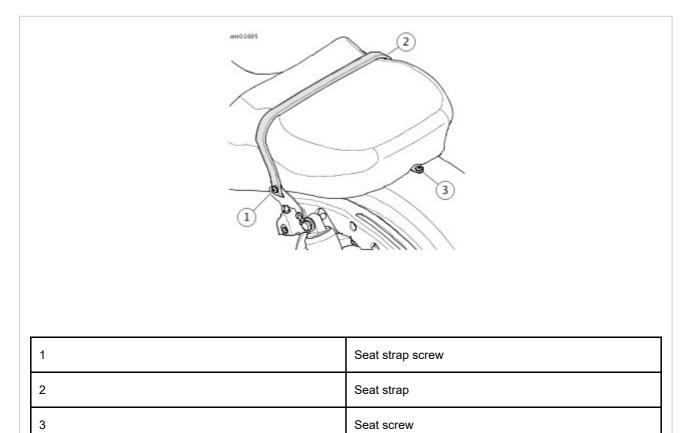
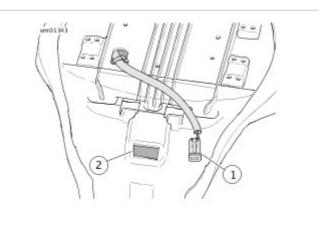


Figure 1. Seat Strap Screw







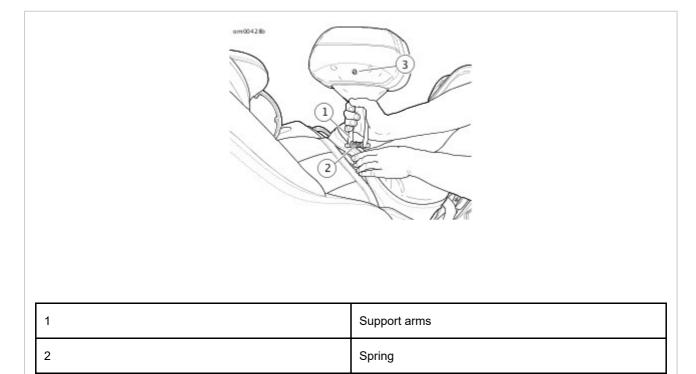
1	Connector
2	Mounting slot

Figure 3. Seat Mounting Slot

- See Seat Mounting Slot. Mate the heated seat connector half (1) to the power connector half found in the frame backbone Y to the left of the battery.
- 2. Place seat on frame backbone.
- See Seat Tongue and Seat Mounting Slot. Firmly push front of seat downward and forward until tongue engages slot in seat.
- 4. Push seat forward until rear fender seat retention nut is centered in hole of mounting bracket.
- 5. See **Seat Strap Screw**. Install seat mounting screw (3). Tighten to 5.4–8.1 N·m (48–72 **in-lbs**).
- 6. Pull up on the seat to be sure it is secure.
- 7. Install end of seat strap (2) in slot of seat strap bracket. Install seat strap screw (1). Tighten to 5.4–8.1 N⋅m (48–72 in-lbs).

- 1. Spread the seat covering at the base of the backrest to expose the two spring loaded support arms.
- $2. \ \ \text{See {\it Rider Backrest Installation}}. \ \ \text{Squeeze together the spring loaded support arms}.$
- 3. Pull upward to remove the backrest from the mounting bracket.

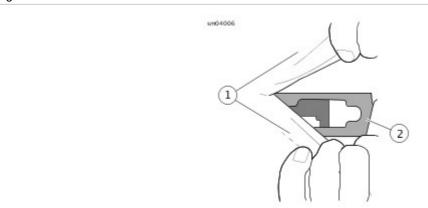
- 1. See Figure 2. Spread the seat covering (1) to expose the backrest mounting bracket (2).
- 2. Squeeze together the two spring loaded support arms on the backrest.
- 3. Insert the support arms into the mounting bracket. For rider comfort, move the backrest up or down to select one of the three sets of vertical adjustment holes.
- 4. Release to lock the backrest in the bracket.
- 5. Verify proper backrest installation.



Tilt adjustment eyelet

Figure 1. Rider Backrest Installation

3

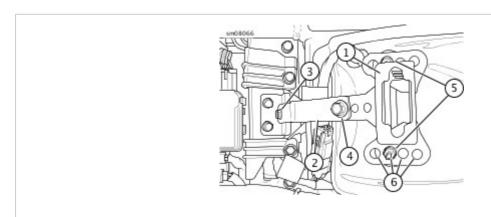


1	Seat covering
2	Backrest mounting bracket

Figure 2. Mounting Bracket Through Seat

See Rider Backrest Installation. Turn screw behind eyelet (3) to adjust angle.

- 1. Remove backrest and seat.
- 2. See **Mounting Bracket Through Seat**. Loosen, but do not remove, screw (3) at base of support strap.
- 3. Remove screw and nut (4). Pivot support strap (2) out of the way.
- 4. Remove nuts (5). Lift mounting bracket (1) off threaded studs
- 5. With the large nylon washers in place, position bracket in selected pair of horizontal adjustment holes (6).
- 6. Install nuts (5). Tighten to 6.8–10.8 N·m (60–96 **in-lbs**).
- 7. Install screw and nut (4). Tighten to 14.9–20.3 N·m (132–180 **in-lbs**).
- 8. Tighten screw (3) to 6.8–10.8 N·m (60–96 in-lbs).
- 9. Install seat. After installing seat, pull up on the seat to be sure it is secure.
- 10. Verify proper backrest installation.



1	Backrest mounting bracket
2	Support strap
3	Screw
4	Screw and nut
5	Nut (2)
6	Horizontal adjustment holes

Figure 1. Backrest Mounting Bracket

- 1. Open saddlebag lid.
- 2. See Saddlebag Power Lock Connector. Separate the power lock electrical connector.
- ${\it 3. \,\,\,} See \, \textbf{Saddlebag \,\,Removal/Installation}. \,\, Turn \,\, the \,\, mounting \,\, screws \,\, counterclockwise \,\, to \,\, remove.$
- 4. Remove saddlebag.

1. See Figure 2. Place saddlebag in position on saddlebag rail (2).

### NOTE

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

- 2. Install mounting screws through grommets into support bracket.
  - a. Tighten the mounting screws until the lever is pointed downward between the 3 o'clock and 9 o'clock positions as shown.
- 3. Check that saddlebag is securely fastened.
  - a. Verify that the saddlebag bottom isolators properly engage the lower support tube.
  - b. Pull on saddlebag to confirm that it is securely fastened.
- 4. See Figure 1. Connect power lock electrical connector.
- 5. Close saddlebag lid.

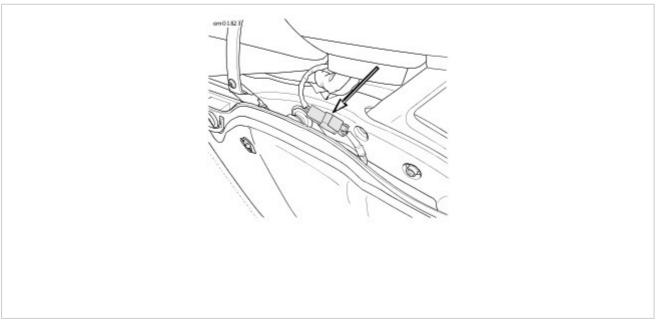
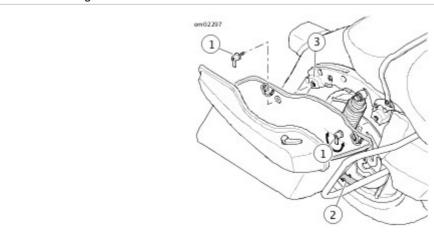


Figure 1. Saddlebag Power Lock Connector

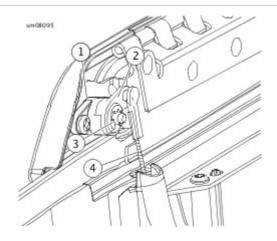


1	Mounting screw with lever

2	Saddlebag rail
3	Support bracket

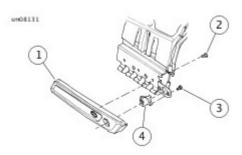
Figure 2. Saddlebag Removal/Installation

- 1. See Figure 1. Remove E-clip (3) from lock (1).
- 2. See Figure 2. Hold face plate (1) while removing screws (2). Remove face plate.
- 3. Remove two screws (3).
- 4. Remove lobe from lock.
- 5. Remove lock assembly.
- 1. See Figure 2. Install lock assembly (4).
- 2. Secure with two screws (3). Tighten to  $2.3-3.4 \text{ N}\cdot\text{m}$  (20–30 **in-lbs**).
- 3. Secure face plate with screws (2). Tighten to 4.5–5.1 N·m (40–45 in-lbs).
- 4. See Figure 1. Install lobe (2) to lock.
- 5. Install new E-clip (3) on lock.



1	Lock
2	Lobe
3	E-clip
4	Cable

Figure 1. E-clip



1	Face plate
2	Screw (3)
3	Screw (2)
4	Lock

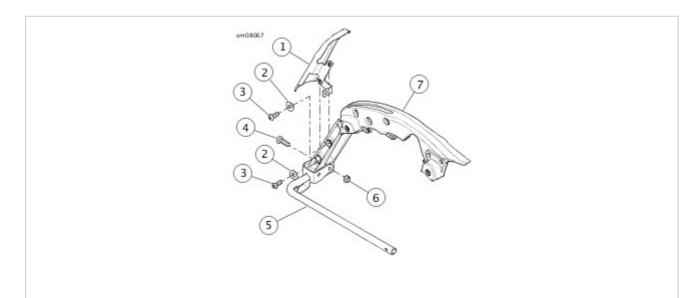
Figure 2. Saddlebag Lock

Saddlebag latch removal and installation are similar to Touring models except for the power lock actuator and lock. See <b>Actuator: Saddlebag</b> and <b>Lock</b> . See the service manual for latch removal.

Saddlebag support servicing is similar to in this section for filler strip removal and i		

- 1. Remove saddlebags. See **Removal**.
- 2. See Filler Strip. Remove two filler strip screws (3) and washers (2) securing filler strip (1) to saddlebag support (7).
- 3. Remove screw (4) and nut (6). Remove filler strip.
- 4. If necessary, remove the saddlebag support. See the service manual.

- 1. If removed, install saddlebag support. See the service manual.
- 2. See **Figure 1**. Install saddlebag filler strip (1) with two screws (3) and washers (2). Leave fasteners loose.
- 3. Install screw (4) and nut (6). Tighten to 20.4–27.1 N·m (15–20 ft-lbs).
- 4. Tighten filler strip screws to 6.8–10.8 N·m (60–96 in-lbs).
- 5. Install the saddlebags. See Removal.



1	Filler strip
2	Washer
3	Screw, filler strip
4	Screw, support tube-to-support casting
5	Support tube
6	Nut
7	Support casting

Figure 1. Filler Strip

Tour-Pak removal and installation are similar to Touring models except for the power lock connector. See the service manual for Tour-Pak removal and installation. See **Figure 1** for connector locations.

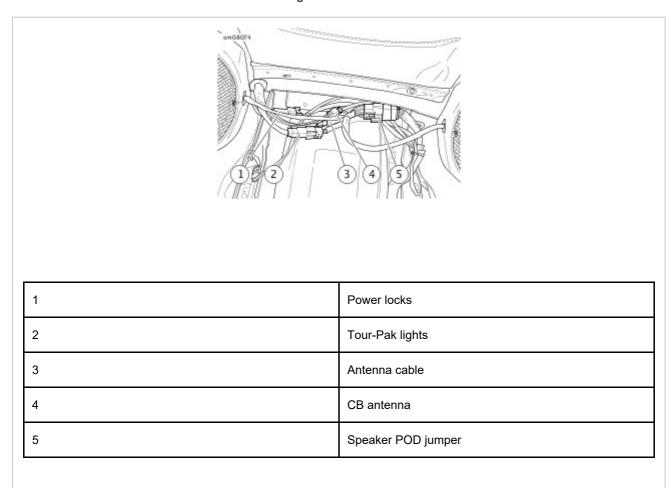


Figure 1. Tour-Pak Connectors

1. Remove upper liner from Tour-Pak cover.

#### **NOTE**

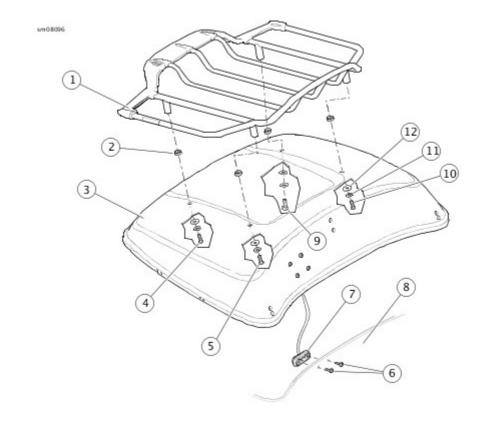
Hold the luggage rack while removing four fasteners and washers.

2. See Figure 1. Remove four fasteners (4, 8) securing luggage rack (1) to Tour-Pak cover (3).

### **NOTE**

The left rear screw is hollow to provide a path for accessory light wires and uses larger washers.

- See Figure 1. Install a flat washer (9) and nylon washer (10) on the hollow screw (8). Apply a small amount of silicone sealant on the threads and also to the surface where the nylon washer contacts the Tour-Pak lid (3).
- Verify that the mounting pads (2) are in place on the legs of the luggage rack (1). Hold luggage rack in place and apply a small bead of silicone sealant around the studs where they pass through the inside of the cover.
- 3. Install nylon washers (10), flat washers (9) and screws (4).
- 4. Install the hollow screw (8) and washers in left-rear location.
- 5. Tighten screws in a cross-wise pattern to 6.8–9.5 N⋅m (60–84 **in-lbs**).
- 6. Install liner in Tour-Pak cover.



1	Luggage rack
2	Mounting pad
3	Tour-Pak cover
4	Screw, small (3)
5	Screws, tether anchor
6	Tether anchor
7	Tour-Pak bottom
8	Screw, hollow
9	Flat washer
10	Nylon washer

Figure 1. Luggage Rack

- 1. Figure 1. Remove screw (2) and cover plate (1).
- 2. Install **new** cover plate (1) with screw. Tighten to 2.8–4 N·m (25–35 **in-lbs**).

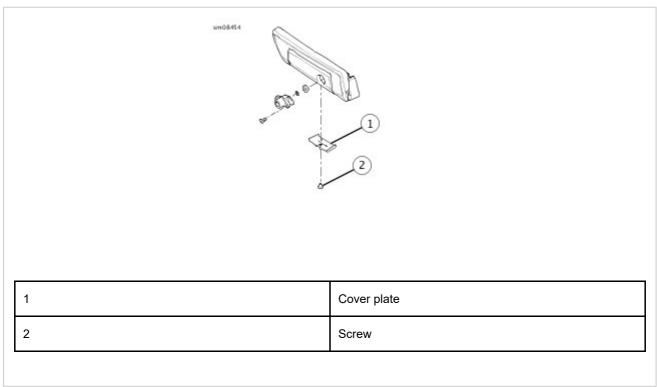


Figure 1. Cover Plate

Do not allow Tour-Pak lid to open fully without the tether attached. Damage to Tour-Pak or hinge could occur.

- 1. See Luggage Rack. Remove screws (5) securing tether anchor (6) to Tour-Pak bottom (7).
- 2. Remove Tour-Pak bottom liner.
- 3. Temporarily install tether anchor.
- 1. See Luggage Rack. Install Tour-Pak bottom liner.
- 2. Place tether anchor (6) into position.
- 3. Install screws (5). Tighten to 1.8–2.5 N·m (16–22 in-lbs).

This chapter provides only unique information for the engine in this model. See the service manual for any specification not shown in the following tables.

Table 1. Engine: Twin-Cooled™ Milwaukee-Eight 117™

Table 1. Engine. Twin-Cooled *** Willwaukee-Eight 117 ***			
Number of cylinders	2		
Туре	4-cycle, 45 degree V-type 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>	1917 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 2. Oiling System

Oil capacity with filter (service oil	Twin-Cooled (new system): 4.5 L (5.0 qt)
change)	Service oil change: 4.5 L (4.75 qt)
Preferred oil	SCREAMIN' EAGLE SYN3 FULL SYNTHETIC MOTORCYCLE LUBRICANT 20W50
Pump	Twin gerotor, dual scavenge, crank mounted and driven, internal oil pump, dry sump
Pressure	207–262 kPa (30–38 psi) at 2000 rpm and normal operating temperature of 110 °C (230 °F)
Filtration	5 micron media, filtered between pump and engine

See the service manual for specifications.

Table 1. Piston: Milwaukee-Eight™ 117

Table 1.1 Istori. WillWaukee-Eight 117		
Fit in cylinder	0.0025-0.0036	0.064-0.091
Piston pin fit (loose)	0.00024-0.0005	0.061-0.0127
Ring end gap:		
Top compression ring	0.010-0.016	0.250-0.400
Second compression ring	0.016-24	0.400-0.600
Oil control ring	0.008-0.028	0.200-0.700
Ring side clearance:		
Top compression ring	0.0012-0.0027	0.030-0.068
Second compression ring	0.0012-0.0027	0.030-0.068
Oil control ring	0.001-0.007	0.025-0.178

Use wear limits as guide to part replacement.

# NOTE

See the service manual for any specification not shown.

Table 1. Cylinder Bore: Milwaukee-Eight™ 117

Standard	4.079	103.61

Engine troubleshooting is the same as other Touring models except for compression specifications. Refer to **Table 1**. See the service manual for procedures.

Table 1. Compression Specifications

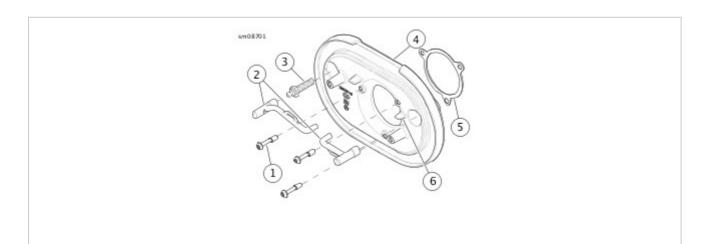
ACR connected	90 (min)	621 (min)
ACR disconnected	175 (min)	1207 (min)

Air cleaner backplate screws	6.2–6.8 N·m (55–60 <b>in-lbs</b> )	4.2 AIR CLEANER BACKPLATE ASSEMBLY, Install
Air cleaner breather bolts	29.8–32.5 N·m (22–24 ft-lbs)	4.2 AIR CLEANER BACKPLATE ASSEMBLY, Install
Muffler end cap fasteners	9.5–12.2 N·m (84–108 <b>in-lbs</b> )	4.4 MUFFLER END CAP, Replacement
Muffler shield clamps	2.3–4.5 N·m (20–40 <b>in-lbs</b> )	4.3 EXHAUST, Muffler Shields
Muffler shield clamps	2.3–4.5 N·m (20–40 <b>in-lbs</b> )	4.4 MUFFLER END CAP, Replacement

For Asia-Pacific air filter assembly, see the service manual.

- 1. Remove air cleaner element. See General.
- 2. See Air Cleaner Backplate. Remove breather tubes (2).
- 3. Remove breather bolts (3).
- 4. Remove screws (1).
- 5. Remove backplate (4). Discard gasket (5).

- 1. See Figure 1. Position new gasket (5) on backplate (4).
- 2. Install backplate but do not tighten screws (1).
- 3. Apply LOCTITE 565 THREAD SEALANT to threads of breather bolts (3).
- 4. Install breather bolts.
- 5. Tighten screws (1) to 6.2–6.8 N·m (55–60 **in-lbs**).
- 6. Tighten breather bolts to 29.8–32.5 N·m (22–24 ft-lbs).
- 7. Install breather tubes (2). Secure to retainer tabs (6) on backplate.
- 8. Install air cleaner element and cover. See General.

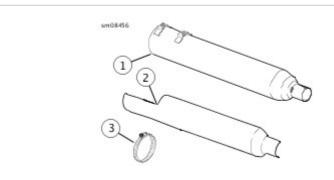


1	Screw (3) (captured)
2	Breather tubes (2)
3	Breather bolts (2)
4	Backplate
5	Gasket
6	Retainer tab (2)

Figure 1. Air Cleaner Backplate

See Figure 1. Separate clamps (3) and remove shield (2) from muffler (1).

See Figure 1. Secure shield (2) to muffler (1) with clamps (3). Tighten to 2.3–4.5 N·m (20–40 in-lbs).



1	Muffler
2	Shield
3	Clamp (3)

Figure 1. Muffler Shield

- 1. Let motorcycle cool.
- 2. See **Figure 1**. Loosen three clamps on muffler shield (2). Rotate shield to access all three fasteners.
- 3. Remove three fasteners (1) holding muffler end cap.
- 4. Remove end cap.
- 5. If necessary, remove and replace clip nut ring and clip nuts.
- 6. Install clip nut ring and clip nuts in end cap.

Install end cap with drain hole facing down.

- 7. Secure end cap with fasteners (1). Tighten to 9.5–  $12.2~N\cdot m$  (84–108 **in-lbs**).
- 8. Return muffler shield (2) to original orientation. Tighten three clamps to 2.3–4.5 N·m (20–40 **in-lbs**).

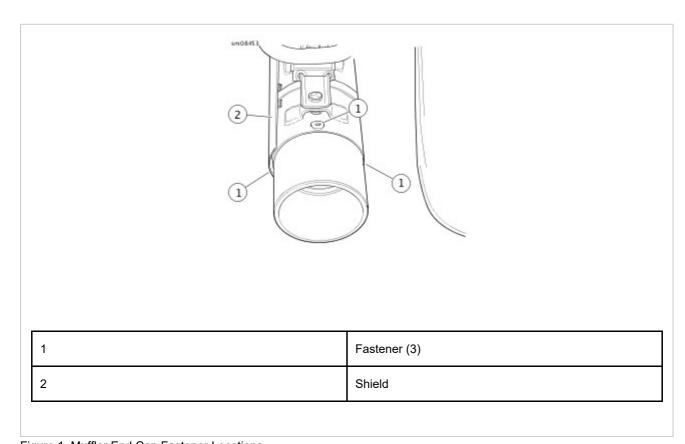


Figure 1. Muffler End Cap Fastener Locations

The preferred lubricant is SCREAMIN' EAGLE SYN3 FULL SYNTHETIC MOTORCYCLE LUBRICANT 20W50.

Table 1. Primary Chaincase Lubricant

Amount*	34	1.0	30	0.9

<sup>\*</sup> Amount is approximate. Fill to bottom of pressure plate OD with vehicle upright.

Table 2. Sprocket Teeth

Table 2. Oprocket reetin		
Primary	Engine	34
	Clutch	46
Final	Transmission	32
	Rear wheel	68

Table 3. Drive Ratios

1	3.34	9.593
2	2.31	6.650
3	1.72	4.938
4	1.39	4.000
5	1.18	3.407
6	1.00	2.875

NOTE

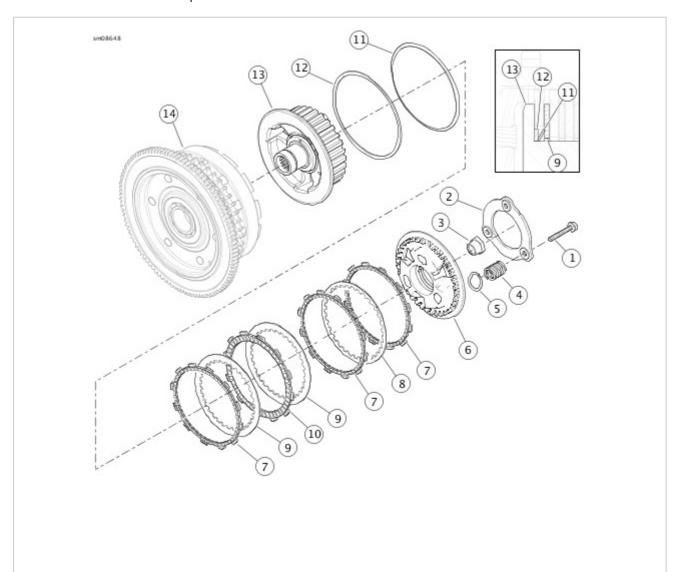
<sup>\*\*</sup> Cover was removed and installed.

<sup>\*\*\*</sup> Lubricant was drained through the drain plug only.

- Transmission gear ratios indicate the number of mainshaft revolutions required to drive the output sprocket one revolution.
- Overall gear ratios indicate the number of engine revolutions required to drive the rear wheel one revolution.

Never mix plates and discs between 9-plate and 10-plate clutches. Trike and CVO models use a 10-plate clutch.

See **Figure 1**. Clutch disassembly and assembly is the same for all Assist and Slip clutches except for plate and disc count. See Clutch: Assist and Slip in the service manual.



1	Bolt (3)
2	Stopper plate
3	Mainshaft nut
4	Coil spring (3)
5	Seat (3)
6	Pressure plate

7	Narrow friction plate (3)
8	Narrow steel plate (1)
9	Wide steel plate (8)
10	Wide friction plate (7)
11	Damper spring
12	Damper spring seat
13	Clutch hub
14	Clutch shell

Figure 1. Clutch Shell Assembly, 10-plate

Table 1. Transmission Lubricant

Туре	6-speed constant mesh Cruise Drive™
Lubricant	SCREAMIN' EAGLE SYN3 FULL SYNTHETIC MOTORCYCLE LUBRICANT 20W50
Capacity	0.95 L (32 fl oz)

Table 2. Transmission Gear Ratios

First (low)	3.34
Second	2.31
Third	1.72
Fourth	1.39
Fifth	1.19
Sixth (high)	1.00

Transmission gear ratios indicate the number of mainshaft revolutions required to drive the output sprocket one revolution.

ABS caddy screw	4.1–4.5 N·m	7.13 POWER LOCKS, Relay Bracket
,	(36–40 <b>in-lbs</b> )	The state of the s
Amplifier bracket screws	9.5–12.2 N·m (84–108 <b>in-lbs</b> )	7.11 AUDIO AMPLIFIER, Installation
Amplifier mounting nuts	8.1–10.8 N·m (72–96 <b>in-lbs</b> )	7.11 AUDIO AMPLIFIER, Installation
Amplifier mounting screws	2.8–4 N·m (25–35 <b>in-lbs</b> )	7.11 AUDIO AMPLIFIER, Installation
Amplifier studs	9.5–12.2 N·m (84–108 <b>in-lbs</b> )	7.11 AUDIO AMPLIFIER, Installation
Battery tray screws	8.1–10.8 N·m (72–96 <b>in-lbs</b> )	7.13 POWER LOCKS, Relay Bracket
Dash panel screws	2.8–3.4 N·m (25–30 <b>in-lbs</b> )	7.8 DASH PANEL AND SWITCHES, Installation
Fork lock screws	4.1–6.8 N·m (36–60 <b>in-lbs</b> )	7.7 FORK LOCK, Fork Lock
Ignition coil screws	3.6–4.5 N·m (32–40 <b>in-lbs</b> )	7.13 POWER LOCKS, Relay Bracket
Relay connector screws	2.8–3.9 N·m (25–35 <b>in-lbs</b> )	7.13 POWER LOCKS, Relay Bracket
Saddlebag actuator screws	3.4–3.9 N·m (30–35 <b>in-lbs</b> )	7.13 POWER LOCKS, Actuator: Saddlebag
Saddlebag cam screw	2.8–3.4 N·m (25–30 <b>in-lbs</b> )	7.13 POWER LOCKS, Actuator: Saddlebag
Saddlebag lamp nuts	2.5 N·m (22 <b>in-lbs</b> )	7.4 PERIMETER LIGHTING, Saddlebag Lamps
Tail lamp lens screws	2.3–2.7 N·m (20–24 <b>in-lbs</b> )	7.6 TAIL LAMP LENS, Tail Lamp Lens
Tour-Pak power lock actuator screws	2.8–3.9 N·m (25–35 <b>in-lbs</b> )	7.13 POWER LOCKS, Power Locks: Tour-Pak
Turn signal lamp to auxiliary/fog lamp bracket screw: Bullet style turn signal lamps	10.9–13.5 N·m (96–120 <b>in-lbs</b> )	7.3 AUXILIARY LAMPS AND BRACKETS, Auxiliary Lamp Housin
WIM module to bracket screw	3.2–4.3 N·m (28–38 <b>in-lbs</b> )	7.10 RADIO, Wireless Headset Interface Module (WHIM)
WIM module to bracket screw	10.8–12.2 N·m	7.10 RADIO, Wireless Headset

	(96–108 <b>in-lbs</b> )	Interface Module (WHIM)
--	-------------------------	-------------------------

See Figure 1. Remove left side cover to locate fuse and relay block and main fuse. See Figure 2 for fuse assignments.

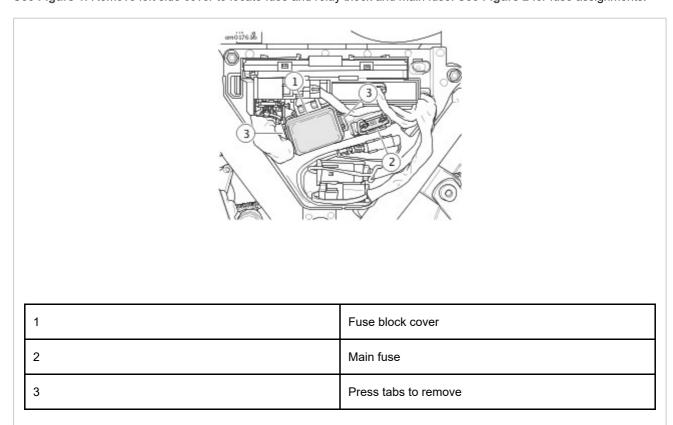
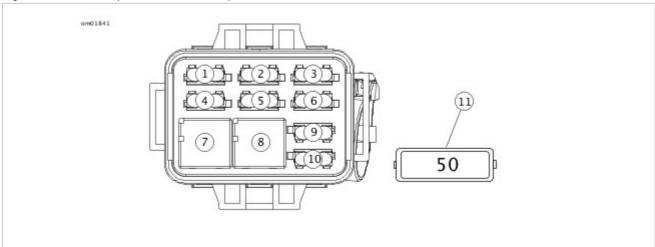


Figure 1. Fuse Block (under left side cover)



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	Fork lock (2 A)
7	P&A relay
8	Cooling relay
9	Spare (7.5 A)
10	Spare (20 A)
11	Main fuse (50 A)
*	Spare fuses are located inside the fuse block cover

Figure 2. Fuses and Relays

#### **Special Tools**

Description	Part Number	Qty.
FLARE NUT SOCKET	FRX181	1

### **NOTE**

Turn signal/auxiliary/fog lamp bracket removal and installation are similar to Touring models except for additional power connector. See the service manual for Turn signal/auxiliary/fog lamp bracket removal and installation.

- Disassemble auxiliary/fog lamp. See the service manual.
- Remove appropriate terminals from connector housings (12, 13). Refer to Table 1 and Table 2. See the electrical diagnostic manual.
- 3. See **Figure 1**. Remove screw (1) and washer to release turn signal lamp (11) from bracket.
- 4. Remove locknut (10), lockwasher (9) and clamp block(8) using

Special Tool: FLARE NUT SOCKET (FRX181)

5.

### **NOTE**

Loose wires with connectors attached need to be fed through bracket one at a time.

Remove auxiliary/fog lamp housing (2) from bracket.

6. Remove rubber washer (7).

- 1. Lay old auxiliary/fog lamp next to **new** auxiliary/fog lamp and cut wire to length.
- 2. Strip wire insulation to specification. Length/Dimension/Distance: 4.8 mm (0.2 in)
- 3. Crimp on **new** socket terminals. See the electrical diagnostic manual.
- 4. See Figure 1. Install rubber washer (7) on stud.

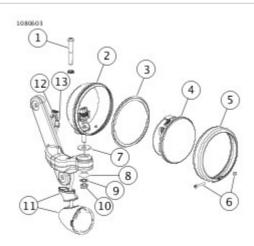
- 5. Position auxiliary/fog lamp housing on bracket. Install clamp block (8), lockwasher (9) and locknut (10).
- 6. Tighten locknut using

Special Tool: FLARE NUT SOCKET (FRX181)

- 7. Route wires through passage in bracket and protective conduit.
- Install terminals into connector housing. See the electrical diagnostic manual. Refer to Table 1 and Table 2.
- 9. Install turn signal lamp. Secure with screw (1). Tighten screw

Torque: 10.9–13.5 N·m (96–120 **in-lbs**) *Turn signal* lamp to auxiliary/fog lamp bracket screw: Bullet style turn signal lamps

- 10. Install lamp/bracket assembly: Mate connector. Install lamp bracket. See the service manual.
- 11. Assemble auxiliary/fog lamp. See the service manual.
- 12. Check for proper operation and alignment. Adjust if necessary.



1	Screw, turn signal
2	Auxiliary/fog lamp housing
3	Nesting ring
4	Lamp
5	Door
6	Screw and nut
7	Rubber washer

8	Clamp block
9	Lockwasher
10	Locknut
11	Turn signal lamp and standoff
12	4-pin connector
13	2-pin connector

Figure 1.

Table 1. Auxiliary/Fog Lamps [31L/R]

	, ,		
GY/BK	4	GY/BK	4
BK	3	ВК	3
V/BN	2	V/BN	2
BE	1	BE	1

Table 2. Auxiliary/Fog Lamps Ground [335A-L/R]

BK	2	BK	2
PLUG	1	PLUG	1

- 1. Remove upper Tour-Pak liner.
- 2. Disconnect interior lamp connector.
- 3. See Figure 1. Pry tabs to remove lamp from cover.
- 4. Clean the mounting area with isopropyl alcohol. Allow to dry completely.
- 5. Install **new** lamp on cover.
- 6. Connect interior lamp connector.
- 7. Install upper Tour-Pak liner.



Figure 1. Tour-Pak Interior Lamp Tabs

- 1. Remove lower Tour-Pak liner. See Tour-Pak Bottom Liner.
- 2. Disconnect ground wire connectors.

See Figure 1. Screws (2) secure both the ground plate and marker lamps/trim strips.

3. Remove screws (2).

#### NOTE

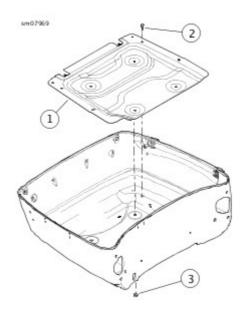
Slots in Tour-Pak support allow position adjustment. Record position before removal.

- 4. Hold Tour-Pak from tipping and remove four flange nuts (3). Remove ground plate.
- 5. Install a temporary screw and nut to prevent Tour-Pak from tipping until assembly.
- 6. Separate saddlebag lamp connector.
- 7. Remove nuts from hollow studs.
- 8. Remove saddlebag lamp, wiring and grommet from Tour-Pak.
- 1. Install saddlebag lamp connector, wiring and grommet in Tour-Pak.
- 2. Install nuts. Tighten to 2.5 N·m (22 in-lbs).
- 3. Mate saddlebag lamp connector.
- Install lower Tour-Pak liner. See Tour-Pak Bottom Liner.

# **⚠** 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)

5. Check operation of all lamps.



1	Ground plate
2	Screws (4)
3	Flange nut (4)

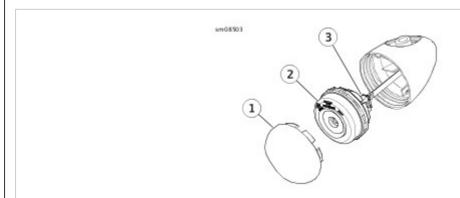
Figure 1. Ground Plate

- 1. See Figure 1. Remove lens (1).
- 2. Remove LED assembly (2) from lamp housing.
- 3. Separate connector (3).
- 1. Mate connector.
- 2. Align LED assembly to housing. Press evenly until fully
- 3. Install lens.

# **ℳ** 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)

4. Check operation of all lamps.



1	Lens
2	LED assembly
3	Connector

Figure 1. LED Turn Signal Lamp

- 1. Remove screws securing tail lamp assembly to base. See the service manual.
- 2. Remove gasket from lamp assembly.
- 3. See Figure 1. Press tabs to remove lens from tail lamp assembly.
- 1. Install gasket to tail lamp assembly.
- 2. Align lens to tail lamp assembly. Insert tail lamp assembly to lens. Press lens until full seated on base.
- 3. Install tail lamp assembly to base. 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)

4. Check operation of all lamps.

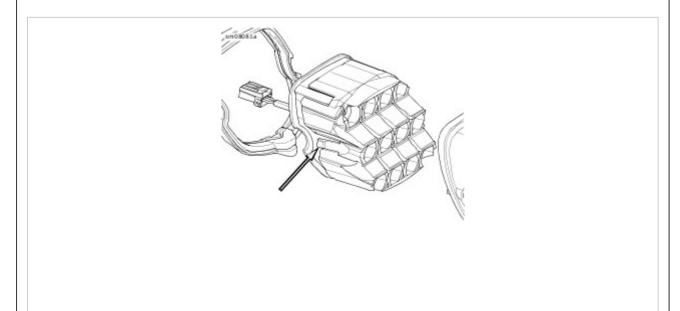
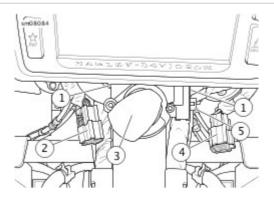


Figure 1. Tail Lamp Lens

- 1. Remove main fuse.
- 2. Remove dash panel. See Remove.
- 3. See Figure 1. Disconnect fork lock connector (5).
- 4. Rotate inner fairing. See the service manual.
- 5. Remove screws (1). Remove fork lock (3).



1	Screw and washer (not shown)
2	Dash panel switch connector, left
3	Fork lock
4	Dash panel switch connector, right
5	Fork lock connector

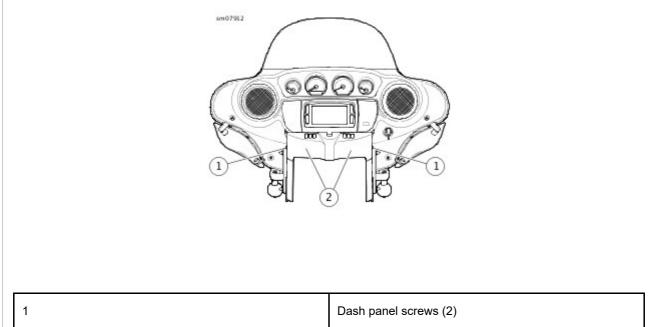
Figure 1. Fork Lock

- 1. See Figure 1. Install the fork lock (3).
- 2. Install screws (1). Tighten to 4.1–6.8 N·m (36–60 in-lbs).
- 3. Rotate inner fairing into position. See the service manual.
- 4. Install fork lock connector (5).
- 5. Install dash panel. See Remove.
- 6. Install main fuse.

# **⚠** WARNING

To prevent spray of fuel, purge system of high-pressure fuel before supply line is disconnected. Gasoline is extremely flammable and highly explosive, which could result in death or serious injury. (00275a)

- 1. Purge and disconnect fuel supply line. See the service manual.
- 2. Remove screws securing fuel tank. See the service manual.
- 3. Slide fuel tank rearward.
- 4. See Figure 1. Remove two screws (1) to release dash panel.
- 5. Remove dash panel and disconnect dash panel switch connectors (2).
- 6. See the service manual for switch service.



	1	Dash panel screws (2)
	2	Dash panel switch connectors (not visible)
-		

Figure 1. Dash Panel Screws

- 1. Mate dash panel switch connectors.
- 2. Install dash panel over ignition switch housing.
- 3. Secure dash panel with two screws. Tighten to 2.8–  $3.4 \text{ N} \cdot \text{m}$  (25–30 **in-lbs**).
- 4. Secure fuel tank in position. See the service manual.
- 5. Verify operation of dash panel switches.

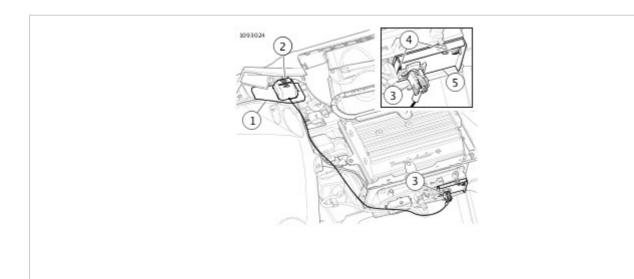
Update the BOOM! B	Box Infotainment software a	fter replacing the GPS	navigation module or the	receiver module.

See the BOOM! Box owner's manual for radio software update information.

Servicing the radio is similar to the Touring models. This model has an extra amplifier and mount. See Removal for

amplifier and mount service. See the service manual for further audio system service.

- 1. Remove outer fairing. See the service manual.
- 2. See Figure 1. Remove antenna connector (3).
- 3. Remove screws (4) and pull module (5) from radio chassis.
- 4. Transfer XM module into **new** radio immediately. If **new** radio is not available, place XM module in a static proof bag and store in a safe place.
- 5. Install screws. Tighten securely.
- 6. Install antenna connector.
- 7. Install outer fairing.



1	Mounting bracket
2	Antenna
3	Antenna connector
4	Screw (2)
5	XM module

Figure 1. XM Components

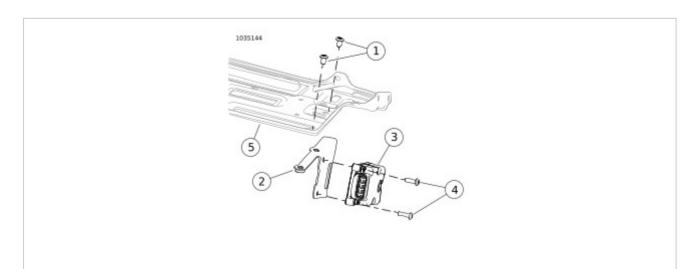
- 1. Remove main fuse.
- 2. Remove outer fairing. See the service manual.
- 3. See XM Components. Remove antenna connector (3).
- 4. Gently pry the antenna (2) from the mounting bracket (1).
- 5. Lift up on bracket to separate from speaker enclosure.
- 1. Install mounting bracket:
  - a. See XM Components.Place mounting bracket (1) in original location.
  - b. Press down firmly to engage Velcro
- 2. Install antenna:
  - a. With the wire lead toward the front, position antenna(2) on bracket to avoid interference with windshield.
  - b. Mate XM radio antenna connector (3) to the module.
- 3. Install outer fairing. See the service manual.
- 4. Install main fuse.

See the BOOM! Box owner's manual for XM radio activation information.

- 1. Remove outer fairing. See the service manual.
- 2. Remove upper amplifier. See Removal.
- 3. Disconnect harness from WIM.
- 4. See Figure 1. Remove upper screws (1).
- 5. Remove bracket (2) with module (3).
- 6. Remove screws (4) to separate module from bracket.
- 7. Install bracket to module with screws (4). Tighten. Torque: 3.2–4.3 N·m (28–38 in-lbs) WIM module to bracket screw
- 8. Install module and bracket to inner fairing support with screws (1). Tighten.

Torque: 10.8–12.2 N·m (96–108 **in-lbs**) *WIM module to bracket screw* 

- 9. Install connector.
- 10. Install upper amplifier. See Removal.
- 11. Install outer fairing. See the service manual.



1.	Screw (2)
2.	Bracket
3.	Module
4.	Screw (2)
5.	Innner fairing support

Figure 1. Wireless Headset Interface Module (WHIM)

- 1. Remove main fuse.
- 2. Remove outer fairing. See the service manual.

See Figure 1. Use a flat blade screwdriver to pull the latch down to release the connector.

- 3. See Amplifier and Mount. Unplug wiring harness connector from amplifier (1).
- 4. Remove nuts (2) securing amplifier bracket (3) to mount (5).
- 5. Lift amplifier and pull studs (9) from grommets (8) to release.
- 6. If removing mount:
  - a. Remove garage door opener from mount. See Transmitter.
  - b. Remove screws (6) securing mount to inner fairing bracket.

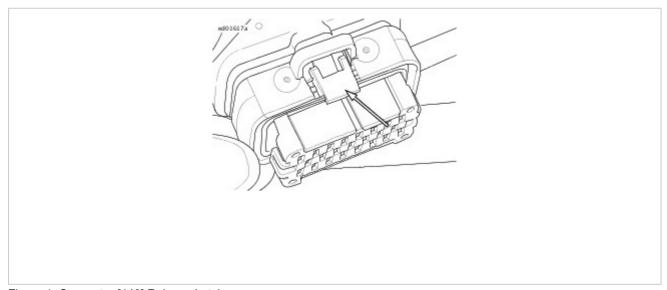
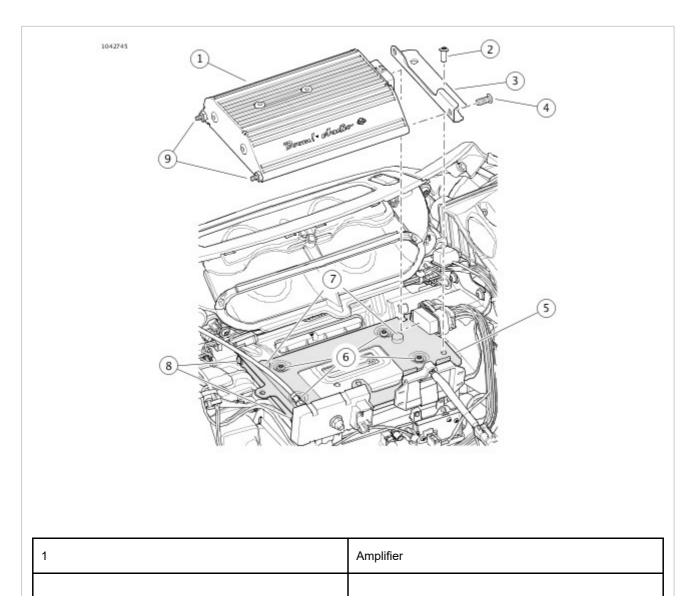


Figure 1. Connector [149] Release Latch

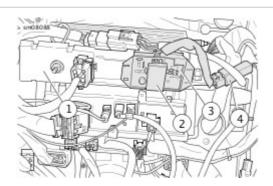
- 1. See Figure 1. If installing mount (5):
  - a. Place mount into position on inner fairing bracket.
  - b. Install screws (6). Tighten to 2.8–4 N·m (25–35 in-lbs).
  - c. Install garage door opener to mount. See **Transmitter**.
- 2. If amplifier bracket (3) was removed from amplifier (1):
  - a. Place amplifier bracket on amplifier.
  - b. Install screws (4). Tighten to 9.5–12.2 N⋅m (84–108 in-lbs).
- Install studs (9) if removed. Tighten to 9.5–12.2 N⋅m (84– 108 in-lbs).
- 4. Install studs into grommets (8).
- 5. Install nuts (2). Tighten to 8.1–10.8 N·m (72–96 **in-lbs**).
- 6. Plug wiring harness connector into amplifier socket.
- 7. Install outer fairing. See the service manual.
- 8. Install main fuse.
- 9. Test sound system for proper operation.



2	Screw (2)
3	Amplifier bracket
4	Screw (2)
5	Mount
6	Screw (4)
7	Pad (4)
8	Grommet (2)
9	Stud (2)

Figure 1. Amplifier and Mount

- 1. Remove main fuse.
- 2. Remove outer fairing. See service manual.
- 3. See Figure 1. Disconnect wiring harness connector (4).
- 4. Remove transmitter (3) from mounting clip (2).
- 1. Install transmitter (3) into mounting clip (2).
- 2. Mate connector (4).
- 3. Verify transmitter function by checking that the LED light on transmitter blinks when the high-low beam switch is activated
- 4. Install outer fairing. See service manual.
- 5. Install main fuse.



1	Power lock receiver
2	Clip
3	Transmitter
4	Connector

Figure 1. Garage Door Opener Transmitter

- 1. Unplug power cord from garage door drive unit to prevent door activation during installation.
- 2. Find an unswitched 110V power outlet in garage that is located either highest in the garage, or closest to front of garage, or both. Locate the Harley-Davidson remote-control garage door opener receiver here.

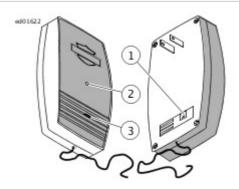
It may be necessary to install the Harley-Davidson receiver away from the garage door opener. Installing the Harley-Davidson receiver close to the opener may reduce the effective transmission range of both systems.

- 3. Find two garage door activation switch terminals at one of these locations:
  - a. The existing wall-mounted, hard wired garage door opener button.
  - b. The garage door drive unit to which the garage door opener button is connected.
- 4. Fasten stripped end of Harley-Davidson garage door opener receiver wires to door opener terminals that activate door opener drive unit. Refer to door opener manufacturer's documentation for terminal locations and connections.

# NOTE

Do not remove original wires from original connections on the door opener button or on drive-unit terminals.

- 5. Assemble and install garage door opener button in its original location.
- 6. Route the plug end of the Harley-Davidson garage door opener wires to the Harley-Davidson garage door opener receiver location.
- 7. See **Figure 1**. Plug connector on Harley-Davidson garage door opener receiver wires into the receptacle (1) back of Harley-Davidson garage door opener receiver.
- 8. Plug garage door opener receiver into selected power outlet.
- 9. Plug power cord from garage door drive unit into power outlet.
- 10. Press wall-mounted garage door opener button to test button operation.



1	Wire connector/plug receptacle
2	LED
3	Set button

Figure 1. Garage Door Opener Receiver

Changes or modifications to this unit not expressly approved by the manufacturer could void the user's authority to operate the equipment.

This equipment has been tested and found to comply with the limits for Class B digital devices pursuant to Part 15, Subpart B of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential environment.

This equipment generates, uses, and can radiate radio frequency energy, and if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation.

If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures.

- Reorient or relocate the receiving antenna.
- Increase the distance between the equipment and the receiver.
- Connect the equipment to an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

The receiver must be programmed to receive the transmitter frequency. This process may require two people, depending on how far apart the receiver and transmitter are during the programming process.

- Check that a red light is visible on the front of the Harley-Davidson garage door opener receiver, indicating power to the receiver.
- See Garage Door Opener Receiver. Press and hold the Set button (3) on the Harley-Davidson garage door opener receiver. The LED (2) blinks continuously while the Set button is pressed.
- 3. Turn ignition switch ON. Switch the headlamp beam switch using one of these sequences:
  - a. Starting from Low beam, switch High, then Low.
  - b. Starting from High beam, switch Low, then High.

## NOTE

When the receiver receives a signal from the transmitter, the LED on the transmitter turns off.

4. Release the Set button on the receiver.

### NOTE

Clear all obstructions away from between the transmitter and receiver before testing the operation of the garage door opener.



# **⚠** 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)

5. Test the garage door opener, high beam, and low beam headlamp operation.

# **NOTE**

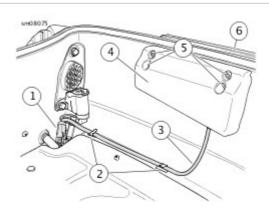
When the transmitter is activated by toggling the headlamp switch, the red LED on the transmitter illuminates for one second to indicate that the transmitter is functioning correctly.

6. Turn ignition switch OFF.

- 1. Remove Tour-Pak bottom liner. See Removal and Installation.
- 2. See Figure 1. Separate the power lock connector (1).
- 3. Remove wiring (3) from clips (2).
- 4. Remove the screws (5) securing the latch handle (6) to the power lock actuator (4).

See **Figure 2**. Use key to hold lock in horizontal position (1) during installation. Tab on lock must fit tab (3) on actuator.

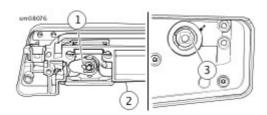
- 1. See **Figure 1**. Place latch handle (6) into position. Place power lock actuator (4) into position.
- 2. Install screws (5). Tighten to 2.8–3.9 N·m (25–35 in-lbs).
- 3. Connect the power lock connector (1).
- 4. Install wiring (3) in clips (2).
- Install Tour-Pak bottom liner. See Removal and Installation.
- 6. Test power lock operation.



1	Power lock connector
2	Clip (2)
3	Wiring
4	Power lock actuator

5	Screw (4)
6	Latch handle

Figure 1. Tour-Pak Power Lock



1	Lock position
2	Latch
3	Tab

Figure 2. Lock/Actuator Installation

- 1. See Figure 1. Remove wire harness from harness retention flap.
- 2. See Figure 2. Separate the power lock connector.
- 3. Remove saddlebag liner.
- 4. Remove saddlebag tether from saddlebag cover.
- 5. See Figure 3. Remove wiring (4) from clips (3).
- 6. Pull wiring, connector and grommet (1) through hole in saddlebag.
- 7. See Figure 4. Remove screw (2) securing cam (1) to latch assembly (8).
- 8. Remove screws (5) securing actuator (6) to latch assembly.
- 1. See **Figure 4**. Place actuator (6) into position on latch assembly (8).
- 2. Install screws (5). Tighten to 3.4–3.9 N·m (30–35 **in-lbs**).

See **Figure 5**. Cam socket (1) must fit over cam drive (2).

3. See **Figure 4**. Install cam (1) and screw (2). Tighten to 2.8–3.4 N·m (25–30 **in-lbs**).

# **NOTE**

See **Figure 3**. Route saddlebag wiring tightly along the inside edge of the saddlebag. Leave extra wiring at hinge to prevent stress on wiring when cover is opened.

- 4. Install wiring (4) into clips (3).
- 5. Pull connector through hole in saddlebag. Install grommet (1). Install cable strap (2) on wiring.
- 6. See Figure 2. Connect power lock connector.
- 7. See **Figure 1**. Secure wire harness with harness retention flap.
- 8. Install saddlebag liner.
- 9. Test power lock operation.

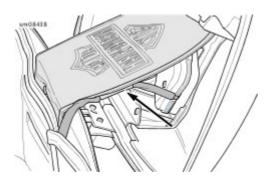


Figure 1. Harness Retention Flap

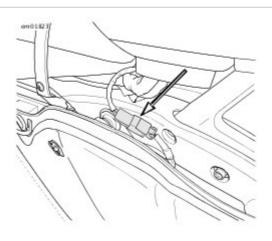
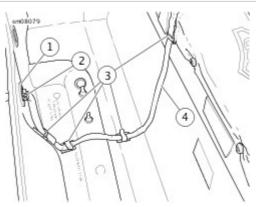


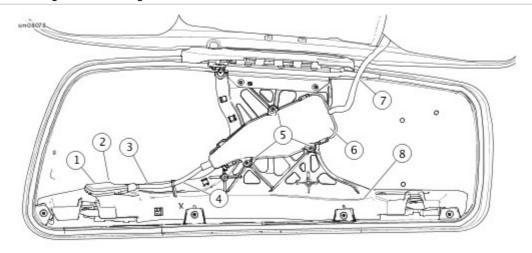
Figure 2. Saddlebag Power Lock Connector



Grommet
Cable strap
Clips

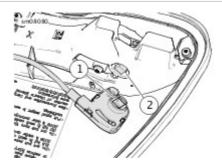
4 Wirin	9
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Figure 3. Saddlebag Actuator Wiring



1	Cam
2	Screw
3	Cable
4	Clip
5	Screw (3)
6	Actuator
7	Wiring
8	Latch assembly

Figure 4. Saddlebag Lock Actuator



	1	Cam socket
	2	Cam drive
Fi	gure 5. Actuator Cam	

## **Special Tools**

Description	Part Number	Qty.
DIGITAL TECHNICIAN II	HD-48650	1

See Figure 1. The motorcycle is shipped with two key fobs. The key fobs and PIN must be electronically assigned by the dealer using DIGITAL TECHNICIAN II (Part Number: HD-48650). Only two fobs can be assigned to a motorcycle at any one time. Replacement fobs must be electronically assigned using DIGITAL TECHNICIAN II (Part Number: HD-48650).

A unique number is attached to a tag on the key fobs. Write the key fob number in the space provided in the front of this manual.

The key fob remotely locks and unlocks the fork lock switch, saddlebags and Tour-Pak. The key fob can actuate the locks while the motorcycle is on or off. The range for power lock operation is approximately 12 m (40 ft).

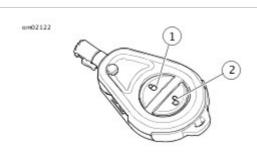
The security system disarms when an assigned key fob is within range. Always carry the fob when riding, loading, fueling, moving, parking or servicing the motorcycle. The range for disarming the security system is approximately 1.5 m (5 ft) from the center of the motorcycle.

**Riding away without the fob:** The odometer window temporarily shows NO FOB if the motorcycle is ridden away without the key fob. To restart a motorcycle without a key fob, disarm the security system with the PIN.

**Remove key fob when parked:** Always lock the fork and remove the key fob when parked. Do not leave the key fob attached to the handlebars or stored in a luggage compartment. If the key fob is within range, the motorcycle can be started and the alarm will not activate.

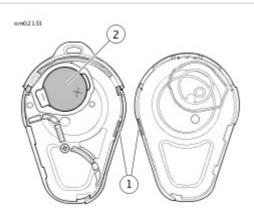
Replace the fob battery every year.

- 1. See Figure 2. Slowly turn a thin blade in the thumbnail slot (1) on the side of the fob to separate the two halves
- 2. Remove the battery (2). Discard or recycle according to local regulations.
- 3. Verify that the metal tabs will firmly contact battery. Bend up slightly if necessary.
- 4. Install a **new** battery (CR2032) with the positive side up.
- 5. Align the two halves of the fob. Snap the halves together.



1	Lock button
2	Unlock button

Figure 1. Key Fob



1	Thumbnail slot
2	Battery

Figure 2. Fob Battery

- 1. Remove right saddlebag.
- 2. Remove right side cover.
- 3. Remove battery. See the service manual.
- 4. Remove ignition coil and battery hold-down bracket. See the service manual.
- 5. See Figure 1. Remove screw (8) securing ABS caddy (1) to battery tray (6).
- 6. Push out clips (10).
- 7. Remove screws (7) securing battery tray to frame.
- 8. Remove relays (2).
- 9. Remove the two screws (5) and washers (4) holding relay connectors (3) to the relay bracket (9).

Lift the ABS caddy while pressing down on the battery tray to separate the caddy from the tray dovetails.

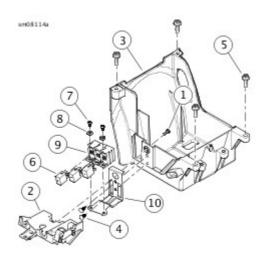
10. Disengage latch on bottom of caddy. Separate the caddy from the tray.

# NOTE

The relay bracket can be worked out between the rear of the ABS caddy and the frame.

11. Remove the relay bracket.

- 1. See **Figure 1**. Install relay bracket (9) between ABS caddy (1) and battery tray (6).
- 2. Install clips (10).
- Engage ABS caddy into dovetails while lifting battery tray up into position. Verify latch on bottom of caddy is engaged.
- 4. Install the screw (8). Tighten to 4.1–4.5 N·m (36–40 **in-lbs**).
- 5. Install the battery tray screws (7). Tighten to 8.1–  $10.8 \text{ N} \cdot \text{m}$  (72–96 **in-lbs**).
- 6. Install the relay connectors (3) with screws (5) and washers (4). Tighten to 2.8–3.9 N·m (25–35 **in-lbs**).
- 7. Install the relays (2).
- Install battery hold-down bracket and ignition coil.
   Tighten to 3.6–4.5 N·m (32–40 in-lbs). See the service manual.
- 9. Install battery. See the service manual.
- 10. Install the side cover.
- 11. Install the saddlebag.



1	ABS caddy
2	Relay (3)
3	Relay connector (3)
4	Washer (2)
5	Screw (2)
6	Battery tray
7	Screw (4)
8	Screw
9	Relay bracket
10	Clips (2)

Figure 1. Power Lock Relay Bracket

Use initial diagnostics as a starting point to efficiently troubleshoot concerns. A basic understanding of electronics and a general knowledge of the vehicle are necessary to effectively use this manual.

# **NOTE**

- Certain diagnostic procedures require part removal. See the service manual for details.
- Certain diagnostic procedures require the use of special tools. See diagnostic tools in the electrical diagnostic manual.
- Certain diagnostic procedures require the use of tests that have precise instructions. See diagnostics and troubleshooting in the electrical diagnostic manual.

Before diagnosing a concern, perform a general functional test of the vehicle to verify the concern. This will also identify any other issues that may affect diagnostics. Use the procedures in this chapter for initial diagnostics.

# **NOTE**

- "IGN ON" means engine stop switch is set to RUN (although engine is not running).
- When working through a diagnostic procedure, follow the steps in the order instructed. Never jump to a test in another procedure. All "Go to test" statements refer to a test in that procedure.
- To turn IGN ON the fob must be present while you press the engine stop switch.

Table 1. Diagnostic Trouble Codes (DTCs) and Fault Conditions Priority Table

Table 1. Diagnostic frouble codes (DTCs) and Fault Conditions Friority fable			
B1337	314	Front left speaker shorted together	Description and Operation
B1339	316	Front left speaker shorted low	Description and Operation
B1340	317	Front left speaker shorted high	Description and Operation
B1345	322	Front right speaker shorted together	Description and Operation
B1347	324	Front right speaker shorted low	Description and Operation
B1348	325	Front right speaker shorted high	Description and Operation
B1367	459	WHIM fault detected	Description and Operation
B1401	352	AMP voltage low	Description and Operation
B1402	353	AMP voltage high	Description and Operation
B1403	354	Speaker output DC offset	Description and Operation
B1404	355	Internal thermal shutdown error	Description and Operation
B1405	372	EQ correlation error	Description and Operation
B1406	373	Invalid or missing EQ	Description and Operation

B1410	356	Channel 1 speaker open	Description and Operation
B1411	357	Channel 1 speaker shorted low	Description and Operation
B1412	358	Channel 1 speaker shorted high	Description and Operation
B1413	359	Channel 1 speaker shorted together	Description and Operation
B1420	360	Channel 2 speaker open	Description and Operation
B1421	361	Channel 2 speaker shorted low	Description and Operation
B1422	362	Channel 2 speaker shorted high	Description and Operation
B1423	363	Channel 2 speaker shorted together	Description and Operation
B1430	364	Channel 3 speaker open	Description and Operation
B1431	365	Channel 3 speaker shorted low	Description and Operation
B1432	366	Channel 3 speaker shorted high	Description and Operation
B1433	367	Channel 3 speaker shorted together	Description and Operation
B1440	368	Channel 4 speaker open	Description and Operation
B1441	369	Channel 4 speaker shorted low	Description and Operation
B1442	370	Channel 4 speaker shorted high	Description and Operation
B1443	371	Channel 4 speaker shorted together	Description and Operation
B2188	222	G3 output shorted low	Description and Operation
B2193	224	H4 output shorted low	Description and Operation
B2198	227	H3 output shorted low	Description and Operation
B2231	268	Fork locked w/VSS	Description and Operation
B2232	269	Fork lock shorted high	Description and Operation
B2233	270	Fork lock shorted low	Description and Operation
B2234	312	Fork lock detected w/option disabled	Description and Operation
B2235	313	Fork lock configuration invalid	Description and Operation
C0077	273	Low tire pressure	Description and Operation
C0083	281	TPMS malfunction	Description and Operation
C2000	274	Front TPMS communication fault	Description and Operation
C2001	275	Rear TPMS communication fault	Description and Operation
C2003	277	Front TPMS sensor fault	Description and Operation

C2004	278	Rear TPMS sensor fault	Description and Operation
C2006	272	TPMS IDs not loaded	Description and Operation
C2007	280	Low tire pressure thresholds not loaded	Description and Operation
U0140	2	Lost comm w/BCM	Description and Operation
U0185	325	Lost comm w/Amp1	Description and Operation
U1302	324	Acc bus perf error	Description and Operation
U1405	335	Accessory bus lost communication with WHIM	Description and Operation

If no DTCs are present, address any symptoms indicating a malfunction. Refer to Table 1.

Table 1. Electrical Symptom Table

No vehicle power	Description and Operation	
Heated seat inoperative	Description and Operation	
Power locks fairing switch inoperative	Description and Operation	
Power locks inoperative	Description and Operation	
Garage door opener inoperative	Description and Operation	
Lamps inoperative	Description and Operation	
Backlit hand control buttons inoperative	Description and Operation	
All speakers inoperative	Description and Operation	
Both left speakers low or no audio	Description and Operation	
Both right speakers low or no audio	Description and Operation	
Left front speaker low or no audio	Description and Operation	
Left speaker pod low or no audio	Description and Operation	
Right front fairing speaker low or no audio	Description and Operation	
Right speaker pod low or no audio	Description and Operation	
Front headset left speaker inoperative	Description and Operation	
Front headset right speaker inoperative	Description and Operation	
Front or rear microphone inoperative	Description and Operation	
Intermittent volume level front or rear headsets	Description and Operation	
Loss of wireless headsets	Description and Operation	
Rear headset left speaker inoperative	Description and Operation	
Rear headset right speaker inoperative	Description and Operation	
Software update fails	Description and Operation	
	Heated seat inoperative  Power locks fairing switch inoperative  Garage door opener inoperative  Lamps inoperative  Backlit hand control buttons inoperative  All speakers inoperative  Both left speakers low or no audio  Both right speakers low or no audio  Left front speaker low or no audio  Left speaker pod low or no audio  Right front fairing speaker low or no audio  Right speaker pod low or no audio  Front headset left speaker inoperative  Front or rear microphone inoperative  Intermittent volume level front or rear headsets  Loss of wireless headsets  Rear headset right speaker inoperative  Rear headset right speaker inoperative	

The CAN bus circuit provides a means for the ECM, instruments, BCM, hand control modules, the ABS module (if equipped), radio and amplifiers (if equipped) to communicate their current status. When all operating parameters on the CAN bus are within specifications, a state of health message is sent between the components.

### NOTE

"IGN ON" means engine stop switch is set to RUN (although engine is not running).

The CAN bus is made up of two circuits. The (W/R) is the CAN bus high circuit and the (W/BK) is the CAN bus low circuit. Both of these circuits show around 2.5V when measured between each of the circuits and ground with the IGN ON. These circuits are connected to each module on the CAN bus network. A fault on either one of these circuits will cause several modules to set "U" codes and may cause a complete loss of communication between all modules.

Table 1. Code Description

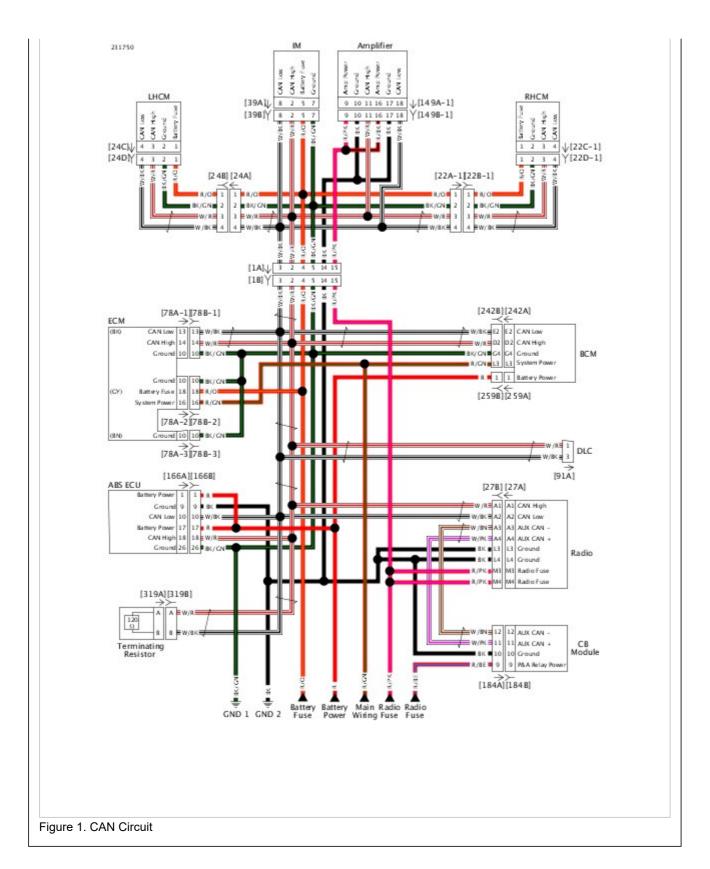
Table II dead Decemplies.					
U0140	Lost communication with BCM, set by speedometer, ECM or ABS				

Modules must have power in order to communicate on the CAN bus. It is important to check for good power and ground on any module that is not communicating effectively on the CAN bus network. At least two modules will set a lost communication DTC when one module has lost the ability to communicate on the CAN bus. When two or more modules are setting the same U-code this indicates a problem with the device the code is set against. If two or more modules are intermittently setting the same U-code, it indicates an intermittent problem with the device the code is set against or intermittent CAN, power or ground wires to the device.

The BCM supplies power to several systems on the vehicle. When testing for a short to voltage, perform all tests before disconnecting the BCM to keep from powering down systems on the vehicle. If the short to voltage goes away when the BCM is disconnected, test for continuity between the circuit in question and BCM [242B] terminals F4, J3, L3, L4 and M2 to verify the tested circuit is not shorted to one of these circuits. If continuity is present, repair shorted circuit instead of replacing the BCM.

Historic U-codes may be found if battery power has been lost for any reason or if the main or battery fuse have been disconnected and reconnected. Disconnecting DTII before powering down vehicle also sets a historic U-code.

For add	For additional information about the connectors in the following diagram(s) and diagnostic procedure(s), see General.							
1								



Description	Part Number	Qty.
TEST CONNECTOR KIT	HD-41404	1
BREAKOUT BOX	HD-50390-1	1
BCM CABLE	HD-50390-2	1
BCM OVERLAY	HD-50390-2-P	1

Table 1. No Vehicle Power, DTC U0140 Diagnostic Faults

Open in CAN high circuit to the BCM
Open in CAN low circuit to the BCM
Open in BCM battery power circuit
Open in BCM ground circuit
Open in RHCM power circuit
Open in RHCM ground circuit
CAN high short to ground
CAN high short to voltage
CAN low short to ground
CAN low short to voltage

# NOTE

The BCM will turn off power to the vehicle if the engine stop switch has been ON for 15 minutes with no inputs from any of the modules or switches.

- 1. Turn IGN OFF.
- 2. Connect BREAKOUT BOX (Part Number:HD-50390-1) and BCM CABLE (Part Number:HD-50390-2) to wire harness [242B], leaving BCM [242A] disconnected.
- 3. Verify BCM OVERLAY (Part Number: HD-50390-2-P) is in position on BOB.
- 4. Disconnect BCM [259].
- 5. Using **TEST CONNECTOR KIT (Part Number:HD-41404)**, test voltage between BCM [259B] terminal 1 and BOB terminal G4.

- Is battery voltage present?
   a. Yes. Go to Test 2.
   b. No. Go to Test 11.
  - 1. Disconnect LHCM [22-1].
  - 2. Test resistance between BOB terminal D2 and [22D-1] terminal 3.
  - 3. Is resistance less than 0.5 Ohm?
    - a. Yes. Go to Test 3.
    - b. No. Repair open in (W/R) wire.
  - 1. Test continuity between BOB terminal D2 and ground.
  - 2. Is continuity present?
    - a. Yes. Repair short to ground in (W/R) wire.
    - b. No. Go to Test 4.
  - 1. Connect [259].
  - 2. Connect [242A].
  - 3. Turn IGN ON.
  - 4. Test voltage between BOB terminal D2 and ground.
  - 5. Is battery voltage present?
    - a. Yes. Repair short to voltage in (W/R) wire.
    - b. No. Go to Test 5.
  - 1. Turn IGN OFF.
  - 2. Test resistance between BOB terminal E2 and [22A-1] terminal 4.
  - 3. Is resistance less than 0.5 Ohm?
    - a. Yes. Go to Test 6.
    - b. No. Repair open in (W/BK) wire.
  - 1. Test continuity between BOB terminal E2 and ground.
  - 2. Is continuity present?
    - a. Yes. Repair short to ground in (W/BK) wire.
    - b. No. Go to Test 7.

- 1. Turn IGN ON.
- 2. Test voltage between BOB terminal E2 and ground.
- 3. Is battery voltage present?
  - a. Yes. Repair short to voltage in (W/BK) wire.
  - b. No. Go to Test 8.
- 1. Test voltage between [22D-1] terminals 1 and 2.
- 2. Is battery voltage present?
  - a. Yes. Go to Test 10.
  - b. No. Go to Test 9.
- 1. Test voltage between [22D-1] terminal 1 and ground.
- 2. Is battery voltage present?
  - a. Yes. Repair open in (BK/GN) wire.
  - b. No. Repair open in (R/O) wire.
- 1. Turn IGN OFF.
- 2. Remove main fuse [5].
- 3. Replace RHCM with a known good RHCM without installing it on the vehicle.
- 4. Install main fuse.
- 5. Push engine stop switch to RUN.
- 6. Turn IGN ON.
- 7. Does vehicle power up?
  - a. Yes. Replace RHCM.
  - b. No. Replace BCM.
- 1. Test voltage between [259B] terminal 1 and ground.
- 2. Is battery voltage present?
  - a. Yes. Repair open in (BK/GN) wire.
  - b. No. Repair open in (R) wire.

See **Figure 1**. Two switches on the side of the seat control the rider and passenger heating areas independently. The forward switch controls the rider area and the rearward switch controls the passenger area.

- In the center position, the heat to that area of the seat is OFF.
- Pressing the lower part of the switch in toward the seat turns the heat in that area ON at the LOW setting.
- Pressing the upper part of the switch in toward the seat turns the heat in that area ON at the HIGH setting.

For safety, after the seat is turned on, 8-10 minutes of warm-up is required before heat is noticed. Press down on the seat with your hand to check for heat.

For safety, the heated seat is designed to shut-off automatically after one hour of continuous use. The seat can be turned back on immediately after auto shut-off has occurred, with no harm to the system. To reactivate the heated seat, turn the seat switch OFF and then back ON to the desired setting.

#### NOTE

Running a hand over the seat may not detect any change in temperature. The heat has to permeate a layer of foam padding. Always press down on the seat to check for heat.

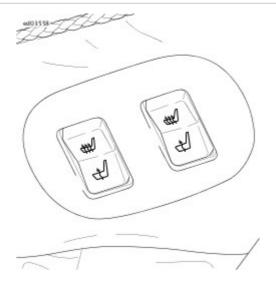
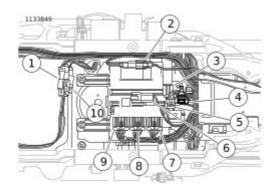


Figure 1. Heated Seat Rocker Switches



1	Rear lighting [7]
2	Fuel tank harness [13]
3	Security antenna [209]
4	WHIM micro USB
5	Purge solenoid [95]
6	Heated seat [191]
7	ECM [78-1] (BK)
8	ECM [78-2] (GY)
9	ECM [78-3] (BN)
10	Rear audio [326]

Figure 2. Under Seat

or additional infor	mation about the co	nnectors in the follo	owing diagram(s) and	d diagnostic proced	lure(s), see General.

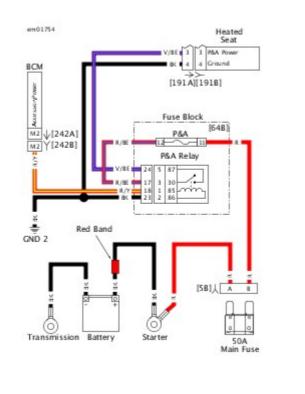


Figure 3. Heated Seat

Description	Part Number	Qty.
TEST CONNECTOR KIT	HD-41404	1
BREAKOUT BOX	HD-50390-1	1
BCM CABLE	HD-50390-2	1
BCM OVERLAY	HD-50390-2-P	1

# Table 1. Heated Seat Inoperative Diagnostic Faults

Open in ground circuit
Open in power circuit
Short to ground in power circuit
Heated seat malfunction

- 1. Turn IGN OFF.
- 2. Disconnect heated seat [191].
- 3. Turn IGN ON.
- 4. Using TEST CONNECTOR KIT (Part Number: HD-41404), test voltage between [191A] terminals 3 and 4.
- 5. Is battery voltage present?
  - a. Yes. Go to Test 8.
  - b. No. Go to Test 2.
- 1. Test voltage between [191A] terminal 3 and ground.
- 2. Is battery voltage present?
  - a. Yes. Repair open in (BK) wire.
  - b. No. Go to Test 3.
- 1. Turn IGN OFF.
- 2. Remove P&A relay [64].
- 3. Test resistance between [64B] socket terminal 24 and [191A] terminal 3.
- 4. Is resistance greater than 0.5 Ohm?

- a. Yes. Repair open in (V/BE) wire.
- b. No. Go to Test 4.
- 1. Remove P&A fuse [64].
- 2. Test resistance between [64B] socket terminals 17 and 12.
- 3. Is resistance greater than 0.5 Ohm?
  - a. Yes. Repair open in (R/BE) wire.
  - b. No. Go to Test 5.
- Connect BREAKOUT BOX (Part Number: HD-50390-1) and BCM CABLE (Part Number: HD-50390-2) to wire harness [242B], leaving BCM [242A] disconnected.
- 2. Verify BCM OVERLAY (Part Number: HD-50390-2-P) is in position on BOB.
- 3. Test resistance between [64B] socket terminal 18 and BOB terminal M2.
- 4. Is resistance greater than 0.5 Ohm?
  - a. Yes. Repair open in (R/Y) wire.
  - b. No. Go to Test 6.
- 1. Test resistance between [64B] socket terminal 23 and ground.
- 2. Is resistance greater than 0.5 Ohm?
  - a. Yes. Repair open in (BK) wire.
  - b. No. Go to Test 7.
- 1. Perform a relay test.
- 2. Did relay pass test?
  - a. Yes. Concern is intermittent. Perform wiggle test.
  - b. No. Replace relay.
- 1. Turn IGN OFF.
- 2. Remove P&A fuse.
- 3. Connect [191].
- 4. Turn IGN ON.
- 5. Place heated seat switch for rider seat in high position.
- 6. Test current between fuse block [64B] socket terminals 11 and 12.

### **NOTE**

When checking current draw, use the 10 Amp maximum fused terminal on the multimeter and switch the selector to DC Amps. If during the tests the multimeter shows 0 Amps, check the multimeter fuse and the terminal location of the meter leads.

- 7. Does current increase to 1.5-3.0 Amps?
  - a. Yes. Go to Test 9.
  - b. No. Replace heated seat assembly. (6547)
- 1. Turn rider heated seat OFF.
- 2. Place passenger pillion heated seat in high position.
- 3. Test current between [64B] socket terminals 11 and 12.
- 4. Does current increase to 0.75-2.0 Amps?
  - a. Yes. Go to Test 10.
  - b. No. Replace heated seat assembly. (6547)
- 1. Inspect seat power harness for pinched or frayed wires.
- 2. Are any wires pinched or frayed?
  - a. Yes. Repair wire(s).
  - b. No. Go to Test 11.
- 1. Test resistance between [191B] terminals 3 and 4.
- 2. Is resistance between 2.0-10.0 Ohms?
  - a. Yes. System operating properly.
  - b. No. Replace heated seat assembly. (6547)

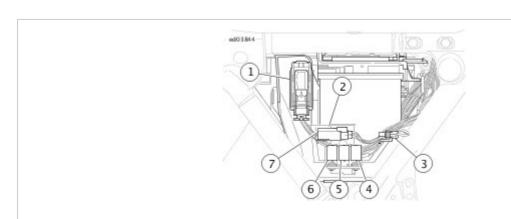
The power lock system is controlled and operated by the BCM. The power lock systems consist of the fork lock switch, Tour-Pak lock and both saddlebag locks. There are two ways to operate the system:

- Power lock buttons on the fob: A RF signal is sent out and received by the BCM on the RF antenna. The BCM energizes the lock or unlock relay depending on the selected button. The relay sends voltage to lock or unlock the system.
- Power lock dash switches: Voltage is sent to the power lock resistor pack. A signal is sent to the IM, which is translated into a CAN signal and sent to the BCM. The BCM energizes the lock or unlock relay depending on the selected switch. The relay sends voltage to lock or unlock the system. The dash switches will only work when the ignition is on.

When the system is activated the turn signals will flash. The turn signals flash one time when the system is unlocked and twice when the system is locked.

Table 1. Code Description

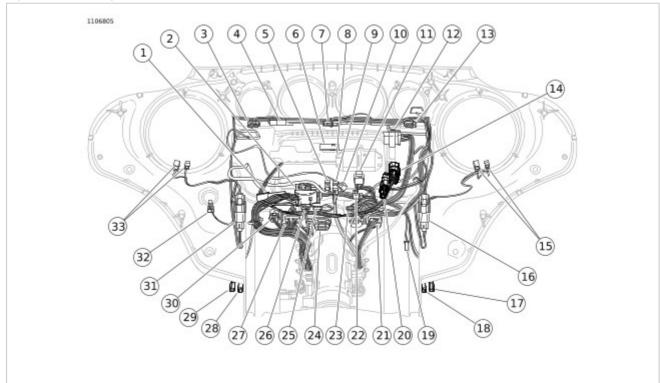
B2188	G3 output shorted low		
B2193	H4 output shorted low		
B2231	Fork locked w/VSS		
B2232	Fork lock shorted high		
B2233	Fork lock shorted low		
B2234	Fork lock detected w/option disabled		
B2235	Fork lock configuration invalid		



1	ABS [166]
2	Front HO2S [137] (behind [138])
3	Rear WSS [168]
4	Perimeter lighting relay [214-3]

5	Unlock relay [214-2]
6	Lock relay [214-1]
7	Rear HO2S [138]

Figure 1. Behind Right Side Cover



1	Power lock resistor pack [200]
2	Radio [27]
3	Voltmeter [111]
4	P&A power [299]
5	USB
6	CB module [184]
7	IM [39]
8	P&A audio [280]
9	Antenna [51]
10	GPS [193]
11	Garage door opener [278]

12	Audio amplifer front [149-1]
13	Fuel gauge [117]
14	WHIM [280]
15	Left front speaker [35-2]
16	Left front speaker [35-1]
17	Left auxiliary lamp [335L]
18	Left front turn signal [31L]
19	Heated hand grip [189]
20	USB in-line [264]
21	Main to interconnect harness [2]
22	XM radio [185]
23	LHCM [24]
24	Headlamp [38]
25	RHCM [22-2]
26	RHCM [22-1]
27	Main to interconnect harness [1]
28	Right front turn signal [31R]
29	Right auxiliary lamp [335R]
30	TGS jumper harness [204]
31	Right front speaker [34-1]
32	Power outlet [132]
33	Right front speaker [34-2]

Figure 2. Behind Fairing

- When testing for voltage on P&A fused power (R/GN), verify that the battery tender is removed from a charging unit.
- When programming a power lock fob, the fob must be in range of the vehicle.

For additional information about the connectors in the following diagram(s) and diagnostic procedure(s), see General. em01891 Fuse Block P&A Relay RF Antenna ■ 8K [39A][39B] [213KB][213KA] Fork Lock Switch [105RA][105RB] Lock Relay Dash Switch Pack [214B-1][214A-1] [200A][200B] Saddlebag RH Lock Resisto Pack [213RB] nic lock Output) 2 Tour-Pak 1 Lock [12B-2][12A-2] [213TA] [242B] A4C2 D2E2 G3G4H4L3 M2 [242A] A4C2 D2E2 G3G4H4L3 M2 TN/R 2 TN/O 1 Saddlebag LH Lock [213LB] GND 2 BCM Figure 3. Fork Lock Circuit

Description	Part Number	Qty.
TEST CONNECTOR KIT	HD-41404	1
BREAKOUT BOX	HD-50390-1	1
BCM CABLE	HD-50390-2	1
BCM OVERLAY	HD-50390-2-P	1

# Table 1. DTC B2188 Diagnostic Faults

Unlock relay malfunction

Short to ground in unlock relay circuit

- 1. Turn IGN OFF.
- 2. Connect BREAKOUT BOX (Part Number:HD-50390-1) and BCM CABLE (Part Number:HD-50390-2) to wire harness [242B], leaving [242A] disconnected.
- 3. Verify BCM OVERLAY (Part Number: HD-50390-2-P) is in position on BOB.
- Using TEST CONNECTOR KIT (Part Number: HD-41404), test resistance between BOB terminal G3 and ground.
- 5. Is resistance less than 10 ohms?
  - a. Yes.
  - b. **No.**
- 1. Disconnect unlock relay [214-2].
- 2. Test continuity between BOB terminal G3 and ground.
- 3. Is continuity present?
  - a. Yes. Repair short to ground in unlock circuit (TN/GY) wire.
  - b. No. Replace unlock relay.
- 1. Connect [242A].
- 2. Test resistance between BOB terminal G3 and ground.
- 3. Is resistance less than 20 ohms?
  - a. Yes. Replace BCM.
  - b. **No.**

- 1. Perform wiggle test.
- 2. Is an intermittent short present?
  - a. Yes. Repair short to ground in unlock circuit (TN/GY) wire.
  - b. **No.** System operating properly.

Description	Part Number	Qty.
TEST CONNECTOR KIT	HD-41404	1
BREAKOUT BOX	HD-50390-1	1
BCM CABLE	HD-50390-2	1
BCM OVERLAY	HD-50390-2-P	1

Table 1	DTC B21	193 Diagn	ostic Fau	lts

Lock relay malfunction

Short to ground in lock relay circuit

- 1. Turn IGN OFF.
- 2. Connect BREAKOUT BOX (Part Number:HD-50390-1) and BCM CABLE (Part Number:HD-50390-2) to wire harness [242B], leaving [242A] disconnected.
- 3. Verify BCM OVERLAY (Part Number: HD-50390-2-P) is in position on BOB.
- Using TEST CONNECTOR KIT (Part Number: HD-41404), test resistance between BOB terminal H4 and ground.
- 5. Is resistance less than 10 ohms?
  - a. Yes. Go to Test 2.
  - b. No. Go to Test 3.
- 1. Disconnect lock relay [214-1].
- 2. Test continuity between BOB terminal H4 and ground.
- 3. Is continuity present?
  - a. Yes. Repair short to ground in lock circuit (TN/BE) wire.
  - b. No. Replace lock relay.
- 1. Connect [242A].
- 2. Test resistance between BOB terminal H4 and ground.
- 3. Is resistance less than 20 ohms?
  - a. Yes. Replace BCM.
  - b. No. Go to Test 4.

- 1. Perform wiggle test.
- 2. Is an intermittent short present?
  - a. Yes. Repair short to ground in unlock circuit (TN/BE) wire.
  - b. **No.** System operating properly.

Description	Part Number	Qty.
TEST CONNECTOR KIT	HD-41404	1
BREAKOUT BOX	HD-50390-1	1
BCM CABLE	HD-50390-2	1
BCM OVERLAY	HD-50390-2-P	1

### Table 1. DTC B2231 Diagnostic Faults

Open fork lock switch feed circuit
Fork lock switch malfunction
Open fork lock switch circuit

- 1. Turn IGN OFF.
- 2. Disconnect fork lock switch [213KB].
- 3. Using **TEST CONNECTOR KIT (Part Number:HD-41404)**, test voltage between [213KB] terminal D and ground.
- 4. Turn IGN ON.
- 5. Is battery voltage present?
  - a. Yes. Go to Test 2.
  - b. No. Repair open between [213KB] terminal D and system power fuse (V/GN) wire.
- 1. Turn IGN OFF.
- 2. Connect BREAKOUT BOX (Part Number: HD-50390-1) and BCM CABLE (Part Number: HD-50390-2) to wire harness [242B], leaving BCM [242A] disconnected.
- 3. Verify BCM OVERLAY (Part Number: HD-50390-2-P) is in position on BOB.
- 4. Test resistance between BOB terminal C2 and [213KB] terminal C.
- 5. Is resistance less than 0.5 ohm?
  - a. Yes. Go to Test 3.
  - b. No. Repair open in (V/BN) wire from [242B] terminal C2 and [213KB] terminals C.
- 1. Perform wiggle test.

- 2. Check DTCs.
- 3. Did DTC reset?
  - a. Yes. Replace fork lock.
  - b. **No.** System operating properly.

Description	Part Number	Qty.
TEST CONNECTOR KIT	HD-41404	1
BREAKOUT BOX	HD-50390-1	1
BCM CABLE	HD-50390-2	1
BCM OVERLAY	HD-50390-2-P	1
0.6 MM TERMINAL EXTACTOR TOOL	HD-50423	1

# Table 1. DTC B2232 Diagnostic Faults

Fork lock switch circuit shorted to voltage

Fork lock switch malfunction

- 1. Turn IGN OFF.
- 2. Disconnect fork lock switch [213K].
- 3. Turn IGN ON.
- Using TEST CONNECTOR KIT (Part Number: HD-41404), test voltage between [213KB] terminal C and ground.
- 5. Is voltage greater than 9.0V?
  - a. Yes. Go to Test 2.
  - b. No. Go to Test 3.
- 1. Disconnect [242B].
- 2. Using 0.6 MM TERMINAL EXTACTOR TOOL (Part Number: HD-50423), remove terminal C2 from [242B].
- 3. Connect BREAKOUT BOX (Part Number:HD-50390-1) and BCM CABLE (Part Number:HD-50390-2) to wire harness [242B] and BCM [242A].
- 4. Verify BCM OVERLAY (Part Number: HD-50390-2-P) is in position on BOB.
- 5. Turn IGN ON.
- 6. Test voltage between BOB terminal C2 and ground.
- 7. Is voltage greater than 9.0V?
  - a. Yes. Repair short to voltage on (V/BN) wire. (5041)
  - b. No. Replace BCM.

- 1. Connect [213K].
- 2. Clear DTCs.
- 3. Perform wiggle test.
- 4. Check DTCs.
- 5. Did DTC reset?
  - a. Yes. Replace fork lock switch. (7287)
  - b. **No.** System operating properly.

Description	Part Number	Qty.
BREAKOUT BOX	HD-50390-1	1
BCM CABLE	HD-50390-2	1
BCM OVERLAY	HD-50390-2-P	1

Table 1. Power Locks Inoperative Diagnostic Faults

Table 1. Fower Locks moperative Diagnos
Power lock fob malfunction
Open in lock signal circuit
Short to ground in lock signal circuit
Short to voltage in lock signal circuit
Open in unlock signal circuit
Short to ground in unlock signal circuit
Short to voltage in unlock signal circuit
Short to ground in power circuit
Open in power circuit
Open in lock input circuit
Open in unlock input circuit

### **NOTE**

Some tests require both power lock fobs to be present.

- 1. Operate power lock system with fobs.
- 2. Operate power locks system with dash switches.
- 3. Do power locks function with both?
  - a. Yes, all power locks work. System operating properly.
  - b. Yes, some power locks work. Go to Test 4.
  - c. No, only with fob. See Power Locks Dash Switch Inoperative.
  - d. No, only with dash switches. Go to Test 2.
  - e. No, nothing works. Go to Test 13.

- 1. Test voltage on fobs batteries.
- 2. Is voltage approximately 2.9V?
  - a. Yes. Go to Test 3.
  - b. No. Replace batteries.
- 1. Program fobs. See the electrical diagnostic manual.
- 2. Did fobs work after programming?
  - a. Yes. System operating properly.
  - b. No, both fobs inoperative. Go to Test 18.
  - c. No, one fob inoperative. Replace inoperative fob and program.
- 1. Operate power locks system with dash switches.
- 2. Is fork lock switch lock inoperative?
  - a. Yes. Go to Test 5.
  - b. No, Tour-Pak lock. Go to Test 7.
  - c. No, left saddlebag lock. Go to Test 9.
  - d. No, right saddlebag lock. Go to Test 11.
- 1. Turn IGN OFF.
- 2. Disconnect fork lock switch lock [213K].
- 3. Remove unlock relay [214-2].
- 4. Remove lock relay [214-1].
- 5. Test resistance between [213KB] terminal A and [214B-2] terminal 3 (TN/R).
- 6. Is resistance less than 0.5 ohm?
  - a. Yes. Go to Test 6.
  - b. No. Repair open between [213KB] terminal A and [214B-2] terminal 3.
- 1. Test resistance between [213KB] terminal B and [214B-1] terminal 3 (TN/O).
- 2. Is resistance less than 0.5 ohm?
  - a. Yes. Replace fork lock switch.
  - b. No. Repair open between [213KB] terminal B and [214B-1] terminal 3.

- 1. Turn IGN OFF.
- 2. Disconnect Tour-Pak lock [213T].
- 3. Remove unlock relay [214-2].
- 4. Remove lock relay [214-1].
- 5. Test resistance between [213TB] terminal 2 and [214B-2] terminal 3 (TN/R).
- 6. Is resistance less than 0.5 ohm?
  - a. Yes. Go to Test 8.
  - b. **No.** Repair open between [213TB] terminal 2 and [214B-2] terminal 3.
- 1. Test resistance between [213TB] terminal 1 and [214B-1] terminal 3 (TN/O).
- 2. Is resistance less than 0.5 ohm?
  - a. Yes. Replace Tour-Pak lock.
  - b. No. Repair open between [213TB] terminal 1 and [214B-1] terminal 3.
- 1. Turn IGN OFF.
- 2. Disconnect left saddlebag lock [213L].
- 3. Remove unlock relay [214-2].
- 4. Remove lock relay [214-1].
- 5. Test resistance between [213LB] terminal 2 and [214B-2] terminal 3 (TN/R).
- 6. Is resistance less than 0.5 ohm?
  - a. Yes. Go to Test 10.
  - b. No. Repair open between [213LB] terminal 2 and [214B-2] terminal 3.
- 1. Test resistance between [213LB] terminal 1 and [214B-1] terminal 3 (TN/O).
- 2. Is resistance less than 0.5 ohm?
  - a. Yes. Replace left saddlebag lock.
  - b. No. Repair open between [213LB] terminal 1 and [214B-1] terminal 3.
- 1. Turn IGN OFF.
- 2. Disconnect right saddlebag lock [213R].
- 3. Remove unlock relay [214-2].
- 4. Remove lock relay [214-1].
- 5. Test resistance between [213RB] terminal 2 and [214B-2] terminal 3 (TN/R).
- 6. Is resistance less than 0.5 ohm?
  - a. Yes. Go to Test 12.
  - b. No. Repair open between [213RB] terminal 2 and [214B-2] terminal 3.

- 1. Test resistance between [213RB] terminal 1 and [214B-1] terminal 3 (TN/O).
- 2. Is resistance less than 0.5 ohm?
  - a. Yes. Replace right saddlebag lock.
  - b. No. Repair open between [213LB] terminal 1 and [214B-1] terminal 3.
- 1. Remove lock relay.
- 2. Remove unlock relay.
- 3. Perform a relay test on both relays.
- 4. Did both relays pass test?
  - a. Yes. Go to Test 14.
  - b. No. Replace inoperative relay.
- 1. Turn IGN OFF.
- 2. Remove P&A fuse [64B].
- 3. Test resistance between [214B-2] terminal 5 and [64B] socket terminal 12 (R/BE).
- 4. Is resistance less than 0.5 ohm?
  - a. Yes. Go to Test 15.
  - b. No. Repair open between [214B-2] terminal 5 and [64B] socket terminal 12 (R/BE).
- 1. Test resistance between [214B-2] terminals 4 and 2 and ground.
- 2. Is resistance on both terminals less than 0.5 ohm?
  - a. Yes. Go to Test 16.
  - b. No. Repair open between [214B-2] terminals 4 and 2 and ground.
- 1. Install both relays.
- 2. Connect BREAKOUT BOX (Part Number:HD-50390-1) and BCM CABLE (Part Number:HD-50390-2) to wire harness [242B] and BCM [242A].
- 3. Verify BCM OVERLAY (Part Number: HD-50390-2-P) is in position on BOB.
- 4. Turn IGN ON.
- 5. Test voltage between BOB terminal H4 and ground.
- 6. Is voltage greater than 2.0V?
  - a. Yes. Repair short to voltage in (TN/BE) wire.
  - b. No. Go to Test 17.

- 1. Test voltage between BOB terminal G3 and ground.
- 2. Is voltage greater than 2.0V?
  - a. Yes. Repair short to voltage in (TN/GY) wire.
  - b. **No.** Replace BCM.
- 1. Turn IGN OFF.
- 2. Verify fobs are present.
- 3. Turn IGN ON.
- 4. Is odometer asking for PIN?
  - a. Yes. See the electrical diagnostic manual.
  - b. **No.** Replace BCM.

Description	Part Number	Qty.
TEST CONNECTOR KIT	HD-41404	1
BREAKOUT BOX	HD-50390-1	1
BCM CABLE	HD-50390-2	1
BCM OVERLAY	HD-50390-2-P	1

#### Table 1. DTC B2233 Diagnostic Faults

Fork lock switch malfunction
Short to ground fork lock switch circuit
Open fork lock switch circuit

- 1. Turn IGN OFF.
- 2. Connect BREAKOUT BOX (Part Number:HD-50390-1) and BCM CABLE (Part Number:HD-50390-2) to wire harness [242B], leaving [242A] disconnected.
- 3. Verify BCM OVERLAY (Part Number: HD-50390-2-P) is in position on BOB.
- 4. Using **TEST CONNECTOR KIT (Part Number:HD-41404)** test continuity between BOB terminal C2 and ground.
- 5. Is continuity present?
  - a. Yes. Go to Test 2.
  - b. No. Go to Test 3.
- 1. Disconnect fork lock switch [213K].
- 2. Test continuity between BOB terminal C2 and ground.
- 3. Is continuity present?
  - a. Yes. Repair short to ground in fork lock circuit (V/BN) wire.
  - b. No. Replace fork lock switch.
- 1. Disconnect fork lock switch [213K].
- 2. Test resistance between BOB terminal C2 and [213KB] terminal C.
- 3. Is resistance less than 0.5 ohm?

- a. Yes. Go to Test 4.
- b. No. Repair open in (V/BN) wire.
- 1. Perform wiggle test.
- 2. Is an intermittent short present?
  - a. Yes. Repair short in (V/BN) wire.
  - b. No. Go to Test 5.
- 1. Clear DTC.
- 2. Cycle IGN OFF, ON, OFF.
- 3. Turn IGN ON.
- 4. Wait 2 minutes, check DTC.
- 5. Did DTC reset?
  - a. Yes. Replace BCM.
  - b. **No.** System operating properly.

Description	Part Number	Qty.
TEST CONNECTOR KIT	HD-41404	1
BREAKOUT BOX	HD-42682	1
BREAKOUT BOX ADAPTERS	HD-46601	1

Table 1. Power Locks Dash Switch Inoperative Diagnostic Faults

<u>'</u>
Open in lock signal circuit
Short to ground in lock signal circuit
Short to voltage in lock signal circuit
Open in unlock signal circuit
Short to ground in unlock signal circuit
Short to voltage in unlock signal circuit
Short to ground in power circuit
Open in power circuit
Open in lock input circuit
Open in unlock input circuit
Dash switch malfunction

- 1. Verify dash switches.
- 2. Press lock button.
- 3. Press unlock button.
- 4. Are both buttons inoperative?
  - a. Yes. Go to Test 2.
  - b. No, lock button inoperative. Go to Test 12.
  - c. No, unlock button inoperative. Go to Test 15.
- 1. Remove P&A relay [64B].

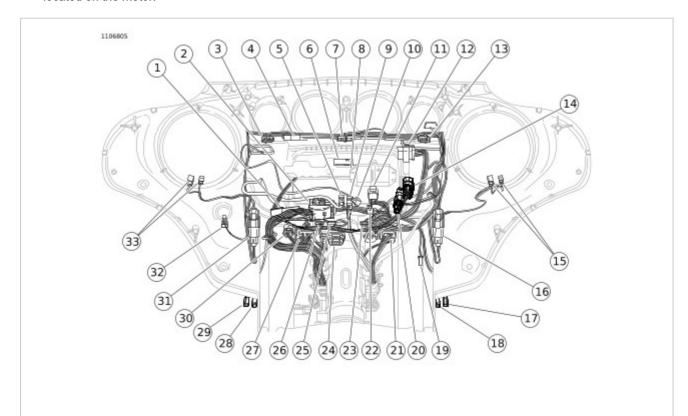
- 2. Test voltage between [64B] socket terminal 17 and ground.
- 3. Is battery voltage present?
  - a. Yes. Go to Test 3.
  - b. No. Repair open in (R/BE).
- 1. Turn IGN ON.
- 2. Test voltage between [64B] socket terminal 18 and ground.
- 3. Is battery voltage present?
  - a. Yes. Go to Test 4.
  - b. No. Repair open in (R/Y).
- 1. Turn IGN OFF.
- 2. Test resistance between [64B] socket terminal 23 and ground.
- 3. Is resistance less than 0.5 ohm?
  - a. Yes. Go to Test 5.
  - b. No. Repair open in (BK).
- 1. Perform a relay test.
- 2. Did relay pass test?
  - a. Yes. Go to Test 6.
  - b. No. Replace relay.
- 1. Disconnect dash switch [105R].
- 2. Test resistance between [105RB] terminal 5 and fuse block [64B] terminal 24 (V/BE).
- 3. Is resistance less than 0.5 ohm?
  - a. Yes. Go to Test 7.
  - b. No. Repair open in (V/BE).
- 1. Connect P&A relay [64B].
- 2. Disconnect resistor pack [200].
- 3. Connect BREAKOUT BOX ADAPTERS (Part Number: HD-46601) to [39].
- 4. Attach connectors from **BREAKOUT BOX (Part Number:HD-42682)** to harness adapters leaving [39A] disconnected.
- 5. Using **TEST CONNECTOR KIT (Part Number:HD-41404)**, test resistance between BOB terminal 6 and [200B] terminal 1 (BK/GN).
- 6. Is resistance less than 0.5 ohm?

- a. Yes. Go to Test 8.
- b. No. Repair open in (BK/GN).
- 1. Test resistance between BOB terminal 6 and ground.
- 2. Is resistance less than 0.5 ohm?
  - a. Yes. Repair short to ground in (BK/GN).
  - b. No. Go to Test 9.
- 1. Connect [39A].
- 2. Turn IGN ON.
- 3. Test voltage between BOB terminal 6 and ground.
- 4. Is voltage greater than 1.0V?
  - a. Yes. Repair short to voltage on (BK/GN).
  - b. No. Go to Test 10.
- 1. Test voltage between [200B] terminal 3 and ground.
- 2. Is voltage greater than 0.5V?
  - a. Yes. Repair short to voltage on (LBE/Y).
  - b. No. Go to Test 11.
- 1. Test voltage between [200B] terminal 2 and ground.
- 2. Is voltage greater than 0.5V?
  - a. Yes. Repair short to voltage on (LBE/W).
  - b. No. Go to Test 18.
- 1. Disconnect dash switch [105R].
- 2. Jumper [105RB] terminals 2 (LBE/W) and 5 (V/BE).
- 3. Does system unlock?
  - a. Yes. Replace dash switch pack.
  - b. No. Go to Test 13.
- 1. Disconnect resistor pack [200].

- 2. Using **TEST CONNECTOR KIT (Part Number:HD-41404)**, test continuity between [105RB] terminal 2 and ground.
- 3. Is continuity present?
  - a. Yes. Repair short to ground on (LBE/W).
  - b. No. Go to Test 14.
- 1. Test resistance between [105RB] terminal 2 and [200B] terminal 2 (LBE/W).
- 2. Is resistance less than 0.5 ohm?
  - a. Yes. Replace resistor pack.
  - b. No. Repair open in (LBE/W).
- 1. Disconnect dash switch [105R].
- 2. Jumper [105RB] terminals 3 (LBE/Y) and 5 (V/BE).
- 3. Does system lock?
  - a. Yes. Replace dash switch pack.
  - b. No. Go to Test 16.
- 1. Test continuity between [105RB] terminal 3 and ground.
- 2. Is continuity present?
  - a. Yes. Repair short to ground on (LBE/Y).
  - b. No. Go to Test 17.
- 1. Test resistance between [105RB] terminal 3 and [200B] terminal 3 (LBE/Y).
- 2. Is resistance less than 0.5 ohm?
  - a. Yes. Replace resistor pack.
  - b. No. Repair open in (LBE/Y).
- 1. Connect [200].
- 2. Jumper [105RB] terminals 3 (LBE/Y) and 5 (V/BE).
- 3. Does system lock?
  - a. Yes. Replace dash switch pack.
  - b. No. Replace IM.

The garage door opener has two main components, the garage door opener transmitter and the garage door opener receiver. Both of these components work as an additional unit to the existing automatic garage door opener.

- **Transmitter:** Located on the vehicle, the transmitter is powered through the P&A fuse. It receives input from the headlamp switch. When the headlamp switch is toggled to **LO-HI-LO** or **HI-LO-HI** the transmitter sees that action and sends a RF signal to garage door opener receiver.
- Receiver: Located usually in or around the customer's garage and powered through an 110V power outlet. The
  receiver collects the RF signal from the transmitter and activates the garage door opener motor. The receiver is
  connected directly to the motor through a cable that is connected to the garage door activation switch terminals
  located on the motor.

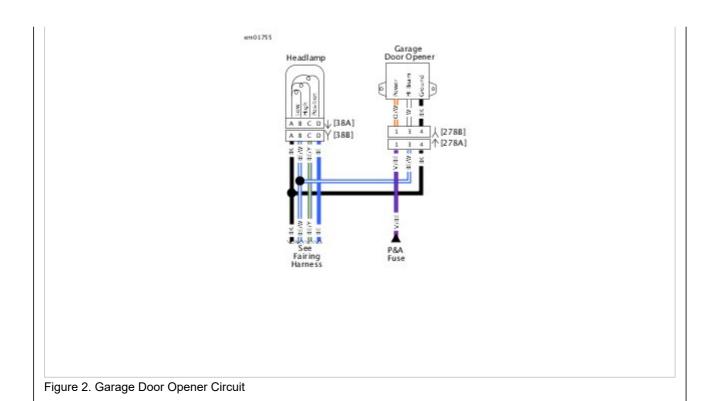


1	Power lock resistor pack [200]
2	Radio [27]
3	Voltmeter [111]
4	P&A power [299]
5	USB
6	CB module [184]
7	IM [39]
8	P&A audio [280]
9	Antenna [51]
10	GPS [193]

11	Garage door opener [278]	
12	Audio amplifer front [149-1]	
13	Fuel gauge [117]	
14	WHIM [280]	
15	Left front speaker [35-2]	
16	Left front speaker [35-1]	
17	Left auxiliary lamp [335L]	
18	Left front turn signal [31L]	
19	Heated hand grip [189]	
20	USB in-line [264]	
21	Main to interconnect harness [2]	
22	XM radio [185]	
23	LHCM [24]	
24	Headlamp [38]	
25	RHCM [22-2]	
26	RHCM [22-1]	
27	Main to interconnect harness [1]	
28	Right front turn signal [31R]	
29	Right auxiliary lamp [335R]	
30	TGS jumper harness [204]	
31	Right front speaker [34-1]	
32	Power outlet [132]	
33	Right front speaker [34-2]	

Figure 1. Behind Fairing

For additional information about the connectors in the following diagram(s) and diagnostic procedure(s), see General.



Description	Part Number	Qty.
TEST CONNECTOR KIT	HD-41404	1

### Table 1. Garage Door Opener Inoperative Diagnostic Faults

Open P&A fuse
Open in garage door opener circuit
Transmitter malfunction
Receiver malfunction
Improper receiver wiring
Insufficient receiver to opener spacing
Programming malfunction

# **NOTE**

- The garage door opener receiver is necessary to complete the diagnostics in the test procedures 5 and 6.
- Verify that the entire vehicle's lighting is working properly before proceeding with the diagnostics.
- Headlamp must remain connected to harness before proceeding with the diagnostics.
  - 1. Monitor garage door opener transmitter and toggle the headlamp switch to  ${\bf LO}{\text{-HI-LO}}$  or  ${\bf HI}{\text{-LO-HI}}$ .
  - 2. Does LED on transmitter flash when headlamp switch is toggled?
    - a. Yes. Go to Test 5.
    - b. No. Go to Test 2.
  - 1. Turn IGN OFF.
  - 2. Disconnect garage door opener transmitter [278].
  - 3. Turn IGN ON.
  - 4. Using **TEST CONNECTOR KIT (Part Number:HD-41404)**, test voltage between [278A] terminal 1 (V/BE) and ground.
  - 5. Is battery voltage present?
    - a. Yes. Go to Test 3.
    - b. No. Repair open in (V/BE) wire.

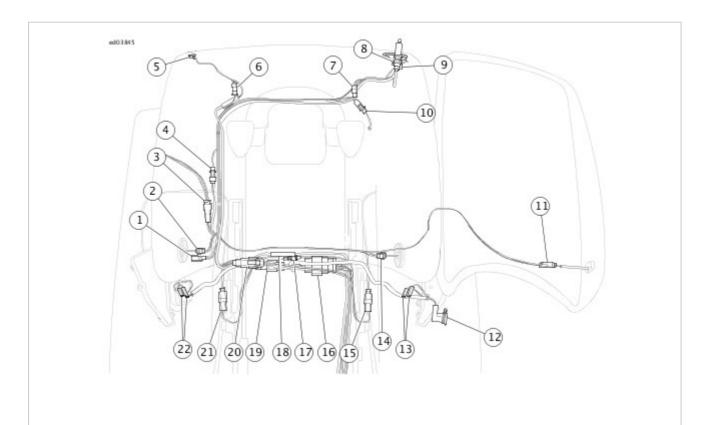
- 1. Turn headlamp switch to HI position.
- 2. Test voltage between [278B] terminal 3 (BE/W) and ground.
- 3. Is battery voltage present?
  - a. Yes. Go to Test 4.
  - b. No. Repair open in (BE/W) wire.
- 1. Turn IGN OFF.
- 2. Test resistance between [278A] terminal 4 and ground.
- 3. Is resistance less than 0.5 ohm?
  - a. Yes. Replace garage door opener transmitter and receiver.
  - b. No. Repair open between [278A] terminal 4 and ground.
- 1. Plug garage door opener receiver into 110V power outlet.
- 2. Turn IGN ON.
- 3. Monitor receiver and toggle headlamp switch to LO-HI-LO or HI-LO-HI.
- 4. Does LED on receiver flash one time when switch is toggled?
  - a. **Yes.** Verification of receiver being properly wired and sufficient spacing to existing garage door is needed. See **Receiver**.
  - b. No. Go to Test 6.
- 1. Unplug receiver from 110V power outlet.
- 2. Wait 10 seconds.
- 3. Press and hold program button on receiver. While holding button down, plug receiver into 110V power outlet. The red LED will flash rapidly.
- 4. Release program button. The receiver is now reset and all memory is erased.
- 5. Re-program receiver. See Remote Control Garage Door Opener.
- 6. Turn IGN ON.
- 7. Monitor receiver and toggle the headlamp switch to LO-HI-LO or HI-LO-HI.
- 8. Does LED on receiver flash one time when switch is toggled?
  - a. Yes. System is now working correctly.
  - b. **No.** Replace garage door opener receiver.

The Tour-Pak lighting system is a LED system that has three parts, the interior lamp and two saddlebag lamps. The lamps are turned ON when the unlock button is pushed and will remain on for approximately 2 minutes.

- Interior lamp: The interior lamp is located in the inside cover of the Tour-Pak.
- Saddlebag lamps: The saddlebag lamps are located on the underside of the Tour-Pak above the saddlebag.

Table 1. Code Description

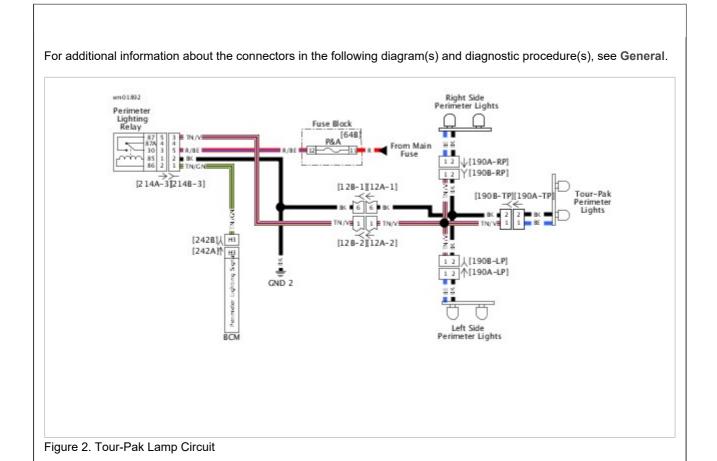
B2198	H3 output shorted low



1	Power outlet [258]
2	Right saddlebag lamp [190-R]
3	Tour-Pak lock [213T]
4	Right side maker lights [12-2B]
5	CB antenna
6	CB ground
7	AM/FM ground
8	AM/FM antenna [51]
9	Tour-Pak lights [287]

10	Left side marker lights [12-3B]
11	Interior lamp [190-T]
12	Left rear speaker [37]
13	Left saddlebag lamp [190-L]
14	Saddlebag lock LH [213L]
15	Rear audio [162]
16	AM/FM antenna [51]
17	CB antenna [104]
18	Tour-Pak lights [12-1]
19	Tour-Pak [12-2]
20	Saddlebag lock RH [213R]
21	Right rear speaker [36]

Figure 1. Tour Pak



Description	Part Number	Qty.
TEST CONNECTOR KIT	HD-41404	1
BREAKOUT BOX	HD-50390-1	1
BCM CABLE	HD-50390-2	1
BCM OVERLAY	HD-50390-2-P	1

# Table 1. DTC B2198 Diagnostic Faults

Perimeter lighting relay malfunction

Short to ground in perimeter lighting relay circuit

- 1. Turn IGN OFF.
- Connect BREAKOUT BOX (Part Number: HD-50390-1) and BCM CABLE (Part Number: HD-50390-2) to wire harness [242B], leaving [242A] disconnected.
- 3. Verify BCM OVERLAY (Part Number: HD-50390-2-P) is in position on BOB.
- Using TEST CONNECTOR KIT (Part Number: HD-41404), test resistance between BOB terminal H3 and ground.
- 5. Is resistance less than 10 Ohms?
  - a. Yes. Go to Test 2.
  - b. No. Go to Test 3.
- 1. Remove perimeter lighting relay [214-3].
- 2. Test continuity between BOB terminal H3 and ground.
- 3. Is continuity present?
  - a. Yes. Repair short to ground in perimeter lighting circuit (TN/GN) wire.
  - b. No. Replace relay.
- 1. Perform wiggle test.
- 2. Is an intermittent short present?
  - a. Yes. Repair short to ground in (TN/GN) wire.
  - b. No. System operating properly.

Description	Part Number	Qty.
TEST CONNECTOR KIT	HD-41404	1

	Table 1.	Lamps	Inoperative	Diagno	stic Faults
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Power circuit open

Ground circuit open

1. Turn perimeter lighting ON.

- 2. Are all lamps inoperative?
  - a. Yes. Go to Test 9.
  - b. No. Interior lamp only. Go to Test 2.
  - c. No. Right saddlebag lamp only. Go to Test 5.
  - d. No. Left saddlebag lamp only. Go to Test 7.
- 1. Turn IGN OFF.
- 2. Disconnect Tour-Pak lights [190-T].
- 3. Turn IGN ON and verify that perimeter lamps are ON.
- 4. Using TEST CONNECTOR KIT (Part Number: HD-41404), test voltage between [190B-TP] terminals 1 and 2.
- 5. Is battery voltage present?
  - a. Yes. Replace Tour-Pak light assembly.
  - b. No. Go to Test 3.
- 1. Turn IGN OFF.
- 2. Disconnect Tour-Pak [213].
- 3. Test resistance between [190B-TP] terminal 1 and [12A-1] terminal 1 (TN/V).
- 4. Is resistance less than 0.5 Ohms?
  - a. Yes. Go to Test 4.
  - b. No. Repair open in (TN/V) wire.
- 1. Test resistance between [190B-TP] terminal 2 and ground.

- 2. Is resistance less than 0.5 ohm?
  - a. Yes. Intermittent problem. Perform wiggle test. Monitor both (TN/V) wire and (BK) wire for open circuit.
  - b. No. Repair open in (BK) wire.
- 1. Turn IGN OFF.
- 2. Disconnect right saddlebag lamp [190-R].
- 3. Turn IGN ON and verify that perimeter lamps are ON.
- 4. Using **TEST CONNECTOR KIT (Part Number:HD-41404)**, test voltage between [109B-RP] terminal 1 and ground.
- 5. Is battery voltage present?
  - a. Yes. Go to Test 6.
  - b. No. Repair open in (TN/V) wire.
- 1. Test resistance between [109B-RP] terminal 2 and ground.
- 2. Is resistance less than 0.5 ohm?
  - a. Yes. Replace right saddlebag lamp assembly.
  - b. No. Repair open in (BK) wire.
- 1. Turn IGN OFF.
- 2. Disconnect left saddlebag lamp [190-L].
- 3. Turn IGN ON and verify that perimeter lamps are ON.
- 4. Using **TEST CONNECTOR KIT (Part Number:HD-41404**), test voltage between [190B-LP] terminal 1 and ground.
- 5. Is battery voltage present?
  - a. Yes. Go to Test 8.
  - b. No. Replace Tour-Pak light assembly.
- 1. Test resistance between [190B-LP] terminal 2 and ground.
- 2. Is resistance less than 0.5 ohm?
  - a. Yes. Replace left saddlebag lamp assembly.
  - b. No. Repair open in (BK) wire.
- 1. Turn IGN OFF.
- 2. Disconnect Tour-Pak [12-2].
- 3. Disconnect Tour-Pak lights [12-1].
- 4. Turn IGN ON.

- 5. Verify that perimeter lamps are ON.
- 6. Press the unlock button.
- 7. Using **TEST CONNECTOR KIT (Part Number:HD-41404)**, test voltage between [12B-1] terminal 6 (BK) and [12B-2] terminal 1 (TN/V).
- 8. Is battery voltage present?
  - a. Yes. Go to Test 13.
  - b. No. Go to Test 10.
- 1. Test voltage between [12B-2] terminal 1 (TN/V) and ground.
- 2. Is battery voltage present?
  - a. Yes. Repair open in (BK) wire.
  - b. No. Go to Test 11.
- 1. Turn IGN OFF.
- 2. Remove perimeter lighting relay [214-3].
- 3. Perform a relay test on relay.
- 4. Did relay pass test?
  - a. Yes. Go to Test 12.
  - b. No. Replace relay.
- 1. Turn IGN ON.
- 2. Test voltage between [214B-3] terminal 5 (R/BE) and ground.
- 3. Is battery voltage present?
  - a. Yes. Repair open in (TN/V) wire.
  - b. **No.** Repair open in (R/BE) wire.
- 1. Disconnect Tour-Pak perimeter lamps [190-TP].
- 2. Test resistance between [12A-2] terminal 1 and [190-TP] terminal 1 (TN/V).
- 3. Is resistance less than 0.5 Ohms?
  - a. Yes. Go to Test 14.
  - b. No. Repair open in (TN/V) wire.
- 1. Test resistance between [12A-1] terminal 6 and [190-TP] terminal 2 (BK).
- 2. Is resistance less than 0.5 Ohms?
  - a. Yes. Check all perimeter lamps.
  - b. No. Repair open in (BK) wire.


The hand control switches are backlit	and are a non-service	able part of the LHCN	∕I and RHCM. The ba	ack lighting on the
hand controls are always on.				

ttons Inoperative Diagnostic Faults

Verify proper operation of backlit hand control buttons in a dark environment. Replace if not functioning properly.

Description	Part Number	Qty.
DIGITAL TECHNICIAN II	HD-48650	1
TPMS ACTIVATION TOOL	HD-51794	1

The Tire Pressure Monitoring System (TPMS) consists of the BCM, IM, radio information screen, and a pressure sensor in each wheel. The BCM receives a RF signal from the sensors on the RF antenna. The pressure sensor measures tire pressure, temperature, and wheel acceleration.

#### NOTE

The TPMS sensor will not communicate pressures above 345–414 kPa (50–60 psi) depending on altitude. Adjust tires to proper pressure before beginning diagnosis.

See **Figure 1** and **Figure 2**. The BCM converts the RF signal to a CAN signal and it is received by the radio and IM. The radio displays tire pressure on the information screen and the IM displays it on the odometer.

The pressure sensor is powered by a non-replaceable long life battery. The sensor is replaced when the battery is depleted.

The pressure sensor has three modes:

- 1. **Test mode:** Prevents data transmission during shipping and storage to maximize battery life.
- Park mode: The sensor changes from test to park mode after detecting tire pressure of approximately 100 kPa
   (15 psi) for 4 minutes. The sensor transmits a periodic burst to the BCM approximately every 4 hours. A
   replacement sensor must be in park mode to be assigned to the BCM using the TPMS ACTIVATION TOOL (Part
   Number:HD-51794) and DIGITAL TECHNICIAN II (Part Number:HD-48650).
- 3. **Drive mode:** The sensor changes from park to drive mode after detecting wheel acceleration for approximately 12 seconds. The sensor transmits a periodic burst to the BCM approximately every minute. The sensor reverts to park mode after detecting no wheel acceleration for approximately 7 minutes.

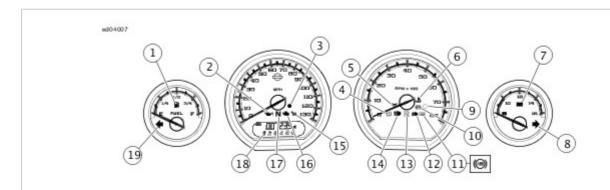
DTC C0083 will accompany all other TPMS DTCs that are set except DTC C0077. Address DTCs according to priority number.

DTC C0077 low tire pressure will result in an informational pop-up screen displayed on the radio once per ignition cycle for each tire that is reported low.

Table 1. Code Description

	ode Becomption
C0077	Low tire pressure
C0083	TPMS malfunction
C2000	Front TPMS communication fault
C2001	Rear TPMS communication fault
C2003	Front TPMS sensor fault

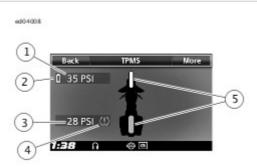
C2004	Rear TPMS sensor fault
C2006	TPMS IDs not loaded
C2007	Low tire pressure thresholds not loaded



1	Low fuel
2	Oil pressure
3	Security
4	TPMS
5	Not used
6	Engine coolant temperature
7	Battery discharge
8	Right turn signal
9	Light sensor (not an indicator)
10	Not used
11	Anti-lock brake system (ABS) icon (km/h ABS icon also shown)
12	Auxiliary/fog
13	Not used
14	Headlamp high beam
15	Cruise control
16	Check engine
17	Neutral

18	Gear
19	Left turn signal

Figure 1. Indicators



1	Front tire pressure
2	Sensor battery low
3	Rear tire pressure
4	Low tire pressure
5	Front and rear tires

Figure 2. Radio Information Screen

- Pressure sensors must be assigned to the BCM using the TPMS ACTIVATION TOOL (Part Number:HD-51794) and DIGITAL TECHNICIAN II (Part Number:HD-48650).
- The vehicle must be at rest for at least 7 minutes before assigning replacement pressure sensors to the BCM.
- Both the security and TPMS indicators illuminate when a TPMS DTC is set.

Description	Part Number	Qty.
TPMS ACTIVATION TOOL	HD-51794	1

Table 1.	DTC C0	077 Diagno	stic Faults
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RF antenna
Low tire air pressure

- 1. Turn IGN OFF for 30 seconds.
- 2. Turn IGN ON.
- 3. Is security system working properly?
  - a. Yes. Go to Test 2.
  - b. No. See electrical diagnostic manual.
- 1. Using tire pressure gauge, measure each tire and inflate both tires to specification. Refer to **Specified Tires**.
- 2. Clear DTCs.
- 3. Turn IGN OFF.
- 4. Using TPMS ACTIVATION TOOL (Part Number:HD-51794), activate front and rear pressure sensors.
- 5. Turn IGN ON.
- 6. Did DTC reset?
  - a. Yes. Replace affected pressure sensor.
  - b. **No.** System working properly.

Description	Part Number	Qty.
DIGITAL TECHNICIAN II	HD-48650	1
TPMS ACTIVATION TOOL	HD-51794	1

# Table 1. DTCs C2000, C2001, C2003, C2004 Diagnostic Faults

-
RF antenna
Calibration issue
Pressure sensor not assigned

# NOTE

The vehicle must be at rest for at least 7 minutes before assigning pressure sensor to BCM.

- 1. Turn IGN OFF for 30 seconds.
- 2. Turn IGN ON.
- 3. Is security system working properly?
  - a. Yes. Go to Test 2.
  - b. No. See electrical diagnostic manual.
- 1. Turn IGN OFF.
- 2. Connect DIGITAL TECHNICIAN II (Part Number: HD-48650).
- 3. Turn IGN ON.
- 4. Configure vehicle settings.
- 5. Verify correct wheel size was selected for TPMS.
- 6. Is proper wheel size was selected?
  - a. Yes. Go to Test 3.
  - b. No. Select correct wheel size.
- 1. Assign pressure sensors using TPMS ACTIVATION TOOL (Part Number: HD-51794).
- 2. Road test vehicle.

- 3. Did DTC reset?
  - a. Replace affected pressure sensor.
  - b. **No.** System working properly.

Description	Part Number	Qty.
DIGITAL TECHNICIAN II	HD-48650	1

•
RF antenna
Pressure sensor not assigned

#### NOTE

The vehicle must be at rest for at least 7 minutes before assigning pressure sensor to BCM.

- 1. Turn IGN OFF for 30 seconds.
- 2. Turn IGN ON.
- 3. Is security system working properly?
  - a. Yes. Go to Test 2.
  - b. No. See electrical diagnostic manual.
- 1. Turn IGN OFF.
- 2. Connect DIGITAL TECHNICIAN II (Part Number: HD-48650).
- 3. Turn IGN ON.
- 4. Configure vehicle settings in DTII.
- 5. Click on toolbox tab.
- 6. Click on vehicle setup.
- 7. Click on TPMS.
- 8. Configure tire sizes. This is important to have the correct tire size for accurate readings.
- 9. Click on update vehicle.
- 10. Click on sensor assignment tab.
- 11. Follow the sensor assignment procedure as written in DTII.
- 12. Road test vehicle.
- 13. Did DTC reset?
  - a. Yes. Replace affected pressure sensor.
  - b. No. System working properly.

Battery voltage is continuously monitored by the amplifier. Any voltage readings outside of normal parameters set a DTC.

- The amplifier monitors [149-1] terminal 9 and 16 for battery power. DTC B1401 is displayed when battery voltage is less than 9.0V.
- The amplifier monitors [149-1] terminal 9 and 16 for battery power. DTC B1402 is displayed when battery voltage is greater than 16.1V for longer than 5 seconds.

#### **NOTE**

ECM, ABS, ECU and/or BCM may also set a battery voltage DTC.

Table 1. Code Description

B1401	AMP voltage low
B1402	AMP voltage high

Any of the following conditions could cause these DTCs to set:

- The charging system is malfunctioning.
- There is excessive battery draw and/or extended idling in heavy traffic.
- A faulty system ground is present. Low voltage generally indicates a loose wire, corroded connections, battery and/or a charging system problem.

For additional information about the connectors in the following diagram(s) and diagnostic procedure(s), see General.

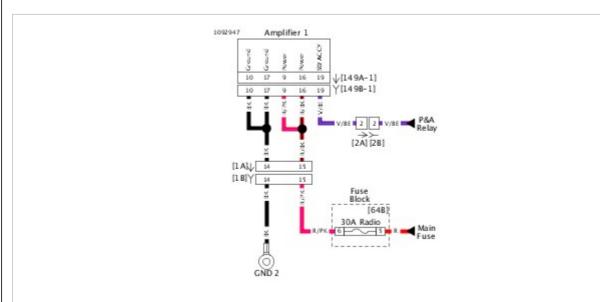


Figure 1.	Amplifier Power Circuit		

Description	Part Number	Qty.
TEST CONNECTOR KIT	HD-41404	1
ADVANCED AUDIO SYSTEM BREAKOUT BOX	HD-47918	1

# Table 1. DTC B1401 Diagnostic Faults

Amplifier power circuit
Open in battery power circuit

- 1. Perform battery test. See battery testing in electrical diagnostic manual.
- 2. Did battery pass test?
  - a. Yes. Go to Test 2.
  - b. No. Replace battery.
- 1. Perform charging system test. See charging system in electrical diagnostic manual.
- 2. Is charging system working properly?
  - a. Yes. Go to Test 3.
  - b. No. Repair charging system.
- 1. Turn IGN OFF.
- 2. Connect ADVANCED AUDIO SYSTEM BREAKOUT BOX (Part Number: HD-47918) to wiring harness [149B-1] and amplifier [149A-1].
- 3. Turn IGN ON.
- 4. Using TEST CONNECTOR KIT (Part Number: HD-41404), test voltage between BOB terminal 9 and ground.
- 5. Is voltage less than 9V?
  - a. Yes. Go to Test 5.
  - b. No. Go to Test 4.
- 1. Test voltage between BOB terminal 16 and ground.

- 2. Is voltage less than 9V?
  - a. Yes. Go to Test 6.
  - b. No. Go to Test 8.
- 1. Perform voltage drop test between BOB terminal 9 and fuse block [64B] socket terminal 6.
- 2. Is voltage drop greater than 0.5V?
  - a. Yes. Go to Test 7.
  - b. No. Problem may be intermittent. Go to Test 8.
- 1. Perform voltage drop test between BOB terminal 16 and fuse block [64B] socket terminal 6.
- 2. Is voltage drop greater than 0.5V?
  - a. Yes. Go to Test 7.
  - b. No. Problem may be intermittent. Go to Test 8.
- 1. Perform voltage drop test between fuse block [64B] socket terminal 6 and main fuse [5B] terminal B.
- 2. Is voltage drop greater than 0.5V?
  - a. Yes. Repair or replace (R) wire between [64B] socket terminal 5 and [5B] terminal B.
  - b. **No.** Repair or replace (R/BK) or (R/PK) wire between [149] terminals 9 and 16 and [64B] socket terminal 6.
- 1. Turn IGN OFF.
- 2. Clear DTCs.
- 3. Start vehicle.
- 4. Run at 3000 rpm for 5 seconds.
- 5. Check DTCs.
- 6. Did DTC reset?
  - a. Yes. Replace amplifier.
  - b. **No.** System working properly.

# Table 1. DTC B1402 Diagnostic Faults Charging system malfunction

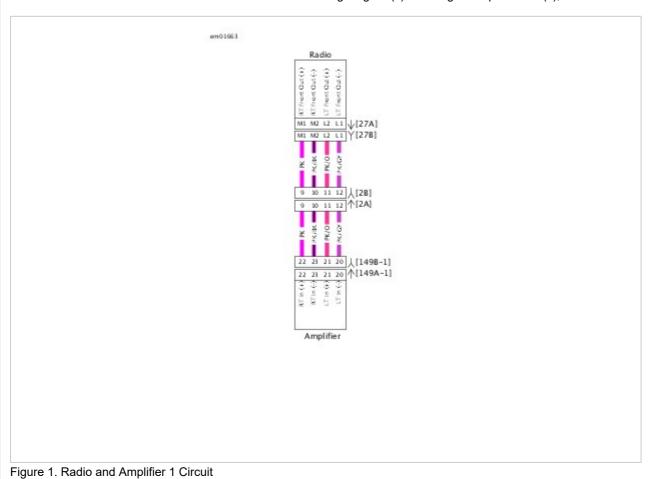
- 1. Perform charging system tests. See charging system in electrical diagnostic manual.
- 2. Is charging system good?
  - a. Yes. Go to Test 2.
  - b. No. Repair charging system.
- 1. Clear DTCs.
- 2. Start vehicle.
- 3. Run at 3000 rpm for 5 seconds.
- 4. Check DTCs.
- 5. Did DTC reset?
  - a. Yes. Replace amplifier.
  - b. No. System working properly.

The radio and amplifier (if equipped) continuously monitor the status of the front speaker circuits.

Table 1. Code Description

	<u>'</u>
B1337	Front left speaker shorted together
B1339	Front left speaker shorted low
B1340	Front left speaker shorted high
B1345	Front right speaker shorted together
B1347	Front right speaker shorted low
B1348	Front right speaker shorted high

For additional information about the connectors in the following diagram(s) and diagnostic procedure(s), see General.



Description	Part Number	Qty.
TEST CONNECTOR KIT	HD-41404	1
BREAKOUT BOX	HD-50390-1	1
BCM CABLE	HD-50390-2	1
BCM OVERLAY	HD-50390-2-P	1

	Table 1.	DTC B1337	Diagnostic	Faults
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Shorted circuit wires
Reset needed

- 1. Turn IGN OFF.
- 2. Connect BREAKOUT BOX (Part Number:HD-50390-1) and BCM CABLE (Part Number:HD-50390-2) to wiring harness [27B], leaving radio [27A] disconnected.
- 3. Verify BCM OVERLAY (Part Number: HD-50390-2-P) is in position on BOB.
- 4. Using TEST CONNECTOR KIT (Part Number: HD-41404), test resistance between BOB terminals L1 and L2.
- 5. Is resistance less than 2 Ohms?
  - a. Yes. Go to Test 2.
  - b. No. Go to Test 4.
- 1. Disconnect amplifier [149-1].
- 2. Test continuity between BOB terminals L1 and L2.
- 3. Is continuity present?
  - a. Yes. Go to Test 3.
  - b. No. Replace amplifier.
- 1. Disconnect fairing [2].
- 2. Test continuity between BOB terminals L1 and L2.
- 3. Is continuity present?
  - a. Yes. Repair short between [27B] terminals L1 and L2 and [2B] terminals 12 and 11.
  - b. No. Repair short between [2A] terminals 11 and 12 and [149B-1] terminals 21 and 20.

- 1. Connect all connectors.
- 2. Perform a pre-calibration reset. See audio specifications and service functions in the electrical diagnostic manual.
- 3. Turn IGN OFF and ON.
- 4. Turn volume up to 75 percent. Allow radio to play for 30 seconds.
- 5. Turn IGN OFF.
- 6. Check DTCs.
- 7. Did DTC reset?
  - a. Yes. Replace radio.
  - b. No. System working properly.

Description	Part Number	Qty.
TEST CONNECTOR KIT	HD-41404	1
BREAKOUT BOX	HD-50390-1	1
BCM CABLE	HD-50390-2	1
BCM OVERLAY	HD-50390-2-P	1

Table 1. DIC DISSS Diaulistic Lauli	Table 1.	DTC B1339	Diagnostic	Faults
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Shorted circuit wires
Reset needed

- 1. Turn IGN OFF.
- 2. Connect BREAKOUT BOX (Part Number:HD-50390-1) and BCM CABLE (Part Number:HD-50390-2) to wiring harness [27B], leaving radio [27A] disconnected.
- 3. Verify BCM OVERLAY (Part Number: HD-50390-2-P) is in position on BOB.
- 4. Using **TEST CONNECTOR KIT (Part Number:HD-41404)**, test continuity between BOB terminal L1 and ground.
- 5. Is continuity present?
  - a. Yes. Go to Test 2.
  - b. No. Go to Test 6.
- 1. Disconnect amplifier [149-1].
- 2. Test continuity between BOB terminal L1 and ground.
- 3. Is continuity present?
  - a. Yes. Go to Test 3.
  - b. No. Go to Test 4.
- 1. Disconnect fairing [2].
- 2. Test continuity between BOB terminal L1 and ground.
- 3. Is continuity present?
  - a. Yes. Repair short to ground between [27B] terminal L1 and [2B] terminal 12 (PK/GY).
  - b. No. Repair short to ground between [2A] terminal 12 and [149B-1] terminal 20 (PK/GY).

- 1. Test continuity between BOB terminals L2 and ground.
- 2. Is continuity present?
  - a. Yes. Go to Test 5.
  - b. No. Replace amplifier.
- 1. Disconnect fairing [2].
- 2. Test continuity between BOB terminal L2 and ground.
- 3. Is continuity present?
  - a. Yes. Repair short to ground between [27B] terminal L2 and [2B] terminal 12 (PK/O).
  - b. No. Repair short to ground between [2A] terminal 11 and [149B-1] terminal 21 (PK/O).
- 1. Connect [27A].
- 2. Perform a pre-calibration reset. See audio specifications and service functions in the electrical diagnostic manual.
- 3. Turn IGN OFF and ON.
- 4. Adjust volume to 3 bars. Allow radio to play for 30 seconds.
- 5. Turn IGN OFF.
- 6. Check DTCs.
- 7. Did DTC reset?
  - a. Yes. Replace radio.
  - b. No. System working properly.

Description	Part Number	Qty.
TEST CONNECTOR KIT	HD-41404	1
BREAKOUT BOX	HD-50390-1	1
BCM CABLE	HD-50390-2	1
BCM OVERLAY	HD-50390-2-P	1
0.6 MM TERMINAL EXTACTOR TOOL	HD-50423	1

Table 1	DTC B13	340 Diagnosti	c Faults

Shorted circuit wires
Reset needed

- 1. Turn IGN OFF.
- 2. Connect BREAKOUT BOX (Part Number:HD-50390-1) and BCM CABLE (Part Number:HD-50390-2) to wiring harness [27B] and radio [27A].
- 3. Verify BCM OVERLAY (Part Number: HD-50390-2-P) is in position on BOB.
- 4. Turn IGN ON.
- 5. Turn radio ON.
- 6. Using TEST CONNECTOR KIT (Part Number: HD-41404), test voltage between BOB terminal L1 and ground.
- 7. Is voltage greater than 9.0V?
  - a. Yes. Go to Test 2.
  - b. No. Go to Test 8.
- 1. Turn IGN OFF.
- 2. Disconnect amplifier [149-1].
- 3. Turn IGN ON.
- 4. Test voltage between BOB terminal L1 and ground.
- 5. Is voltage greater than 9.0V?
  - a. Yes. Go to Test 3.
  - b. No. Go to Test 5.

- 1. Turn IGN OFF.
- 2. Disconnect fairing [2].
- 3. Turn IGN ON.
- 4. Test voltage between BOB terminal L1 and ground.
- 5. Is voltage greater than 9.0V?
  - a. Yes. Go to Test 4.
  - b. No. Repair short to voltage between [2A] terminal 12 and [149B-1] terminal 20 (PK/GY).
- 1. Turn IGN OFF.
- 2. Disconnect [27B].
- Using 0.6 MM TERMINAL EXTACTOR TOOL (Part Number: HD-50423), remove terminal L1 from [27B] (PK/GY).
- 4. Connect [27B].
- 5. Turn IGN ON.
- 6. Test voltage between BOB terminal L1 and ground.
- 7. Is voltage greater than 9.0V?
  - a. Yes. Replace radio.
  - b. No. Repair short to voltage between [2B] terminal 12 and [27B] terminal L1 (PK/GY).
- 1. Test voltage between BOB terminal L2 and ground.
- 2. Is voltage greater than 9.0V?
  - a. Yes. Go to Test 6.
  - b. No. Replace amplifier.
- 1. Turn IGN OFF.
- 2. Disconnect fairing [2].
- 3. Turn IGN ON.
- 4. Test voltage between BOB terminal L2 and ground.
- 5. Is continuity present?
  - a. Yes. Go to Test 7.
  - b. No. Repair short to voltage between [2A] terminal 11 and [149B-1] terminal 21 (PK/O).
- 1. Turn IGN OFF.
- 2. Disconnect [27B].
- Using 0.6 MM TERMINAL EXTACTOR TOOL (Part Number: HD-50423), remove terminal L2 from [27B] (PK/O).
- 4. Connect [27B].
- 5. Turn IGN ON.
- 6. Test voltage between BOB terminal L2 and ground.

- 7. Is voltage greater than 9.0V?
  - a. Yes. Replace radio.
  - b. **No.** Repair short to voltage between [2B] terminal 11 and [27B] terminal L2 (PK/O).
- 1. Perform a pre-calibration reset. See audio specifications and service functions in the electrical diagnostic manual.
- 2. Turn IGN OFF and ON.
- 3. Adjust volume to 3 bars. Allow radio to play for 30 seconds.
- 4. Turn IGN OFF.
- 5. Check DTCs.
- 6. Did DTC reset?
  - a. Yes. Replace radio.
  - b. **No.** System working properly.

Description	Part Number	Qty.
TEST CONNECTOR KIT	HD-41404	1
BREAKOUT BOX	HD-50390-1	1
BCM CABLE	HD-50390-2	1
BCM OVERLAY	HD-50390-2-P	1

Table 1. DTC B1345	Diagnostic	Faults
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Shorted circuit wires
Reset needed

- 1. Turn IGN OFF.
- 2. Connect BREAKOUT BOX (Part Number:HD-50390-1) and BCM CABLE (Part Number:HD-50390-2) to wiring harness [27B], leaving radio [27A] disconnected.
- 3. Verify BCM OVERLAY (Part Number: HD-50390-2-P) is in position on BOB.
- 4. Using TEST CONNECTOR KIT (Part Number: HD-41404), test resistance between BOB terminals M1 and M2.
- 5. Is resistance less than 2 Ohms?
  - a. Yes. Go to Test 2.
  - b. No. Go to Test 4.
- 1. Disconnect amplifier [149-1].
- 2. Test continuity between BOB terminals M1 and M2.
- 3. Is continuity present?
  - a. Yes. Go to Test 3.
  - b. No. Replace amplifier.
- 1. Disconnect fairing [2].
- 2. Test continuity between BOB terminals M1 and M2.
- 3. Is continuity present?
  - a. Yes. Repair short between [27B] terminals M1 and M2 and [2B] terminals 9 and 10.
  - b. No. Repair short between [2A] terminals 9 and 10 and [149B-1] terminals 22 and 23.

- 1. Connect all connectors.
- 2. Perform a pre-calibration reset. See audio specifications and service functions in the electrical diagnostic manual.
- 3. Turn IGN OFF and ON.
- 4. Turn volume up to 75 percent. Allow radio to play for 30 seconds.
- 5. Turn IGN OFF.
- 6. Check DTCs.
- 7. Did DTC reset?
  - a. Yes. Replace radio.
  - b. No. System working properly.

Description	Part Number	Qty.
TEST CONNECTOR KIT	HD-41404	1
BREAKOUT BOX	HD-50390-1	1
BCM CABLE	HD-50390-2	1
BCM OVERLAY	HD-50390-2-P	1

Table 1. DTC B1347 Diagnostic Fau	Table 1.	<b>DTC B1347</b>	Diagnostic	Faults
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Shorted circuit wires
Reset needed

- 1. Turn IGN OFF.
- 2. Connect BREAKOUT BOX (Part Number:HD-50390-1) and BCM CABLE (Part Number:HD-50390-2) to wiring harness [27B], leaving radio [27A] disconnected.
- 3. Verify BCM OVERLAY (Part Number: HD-50390-2-P) is in position on BOB.
- 4. Using **TEST CONNECTOR KIT (Part Number:HD-41404)**, test continuity between BOB terminal M1 and ground.
- 5. Is continuity present?
  - a. Yes. Go to Test 2.
  - b. No. Go to Test 6.
- 1. Disconnect amplifier [149-1].
- 2. Test continuity between BOB terminals M1 and ground.
- 3. Is continuity present?
  - a. Yes. Go to Test 3.
  - b. No. Go to Test 4.
- 1. Disconnect fairing [2].
- 2. Test continuity between BOB terminal M1 and ground.
- 3. Is continuity present?
  - a. Yes. Repair short to ground between [27B] terminal M1 and [2B] terminal 9 (PK).
  - b. No. Repair short to ground between [2A] terminal 9 and [149B-1] terminal 22 (PK).

- 1. Test continuity between BOB terminals M2 and ground.
- 2. Is continuity present?
  - a. Yes. Go to Test 5.
  - b. No. Replace amplifier.
- 1. Disconnect fairing [2].
- 2. Test continuity between BOB terminal M2 and ground.
- 3. Is continuity present?
  - a. Yes. Repair short to ground between [27B] terminal M2 and [2B] terminal 10 (PK/BK).
  - b. No. Repair short to ground between [2A] terminal 10 and [149B-1] terminal 23 (PK/BK).
- 1. Connect [27A].
- 2. Perform a pre-calibration reset. See audio specifications and service functions in the electrical diagnostic manual.
- 3. Turn IGN OFF and ON.
- 4. Adjust volume to 3 bars. Allow radio to play for 30 seconds.
- 5. Turn IGN OFF.
- 6. Check DTCs.
- 7. Did DTC reset?
  - a. Yes. Replace radio.
  - b. No. System working properly.

Description	Part Number	Qty.
TEST CONNECTOR KIT	HD-41404	1
BREAKOUT BOX	HD-50390-1	1
BCM CABLE	HD-50390-2	1
BCM OVERLAY	HD-50390-2-P	1
0.6 MM TERMINAL EXTACTOR TOOL	HD-50423	1

Table 1	DTC F	31348	Diagnostic	Faults

Shorted circuit wires
Reset needed

- 1. Turn IGN OFF.
- 2. Connect BREAKOUT BOX (Part Number:HD-50390-1) and BCM CABLE (Part Number:HD-50390-2) to wiring harness [27B] and radio [27A].
- 3. Verify BCM OVERLAY (Part Number: HD-50390-2-P) is in position on BOB.
- 4. Turn IGN ON.
- 5. Turn radio ON.
- 6. Using TEST CONNECTOR KIT (Part Number: HD-41404), test voltage between BOB terminal M1 and ground.
- 7. Is voltage greater than 9.0V?
  - a. Yes. Go to Test 2.
  - b. No. Go to Test 8.
- 1. Turn IGN OFF.
- 2. Disconnect amplifier [149-1].
- 3. Turn IGN ON.
- 4. Test voltage between BOB terminal M1 and ground.
- 5. Is voltage greater than 9.0V?
  - a. Yes. Go to Test 3.
  - b. No. Go to Test 5.

- 1. Turn IGN OFF.
- 2. Disconnect fairing [2].
- 3. Turn IGN ON.
- 4. Test voltage between BOB terminal M1 and ground.
- 5. Is voltage greater than 9.0V?
  - a. Yes. Go to Test 4.
  - b. No. Repair short to voltage between [2A] terminal 9 and [149B-1] terminal 22 (PK).
- 1. Turn IGN OFF.
- 2. Disconnect [27B].
- 3. Using 0.6 MM TERMINAL EXTACTOR TOOL (Part Number: HD-50423), remove terminal M1 from [27B] (PK).
- 4. Connect [27B].
- 5. Turn IGN ON.
- 6. Test voltage between BOB terminal M1 and ground.
- 7. Is voltage greater than 9.0V?
  - a. Yes. Replace radio.
  - b. No. Repair short to voltage between [2B] terminal 9 and [27B] terminal M1 (PK).
- 1. Test voltage between BOB terminal M2 and ground.
- 2. Is voltage greater than 9.0V?
  - a. Yes. Go to Test 6.
  - b. No. Replace amplifier.
- 1. Turn IGN OFF.
- 2. Disconnect fairing [2].
- 3. Turn IGN ON.
- 4. Test voltage between BOB terminal M2 and ground.
- 5. Is voltage greater than 9.0V?
  - a. Yes. Go to Test 7.
  - b. No. Repair short to power between [2A] terminal 10 and [149B-1] terminal 23 (PK/BK).
- 1. Turn IGN OFF.
- 2. Disconnect [27B].
- 3. Using **0.6 MM TERMINAL EXTACTOR TOOL** (Part Number: HD-50423), remove terminal M2 from [27B] (PK/BK).
- 4. Connect [27B].
- 5. Turn IGN ON.
- 6. Test voltage between BOB terminal M2 and ground.
- 7. Is voltage greater than 9.0V?

- a. Yes. Replace radio.
- b. No. Repair short to voltage between [2B] terminal 10 and [27B] terminal M2 (PK/BK).
- 1. Perform a pre-calibration reset. See audio specifications and service functions in the electrical diagnostic manual.
- 2. Turn IGN OFF and ON.
- 3. Adjust volume to 3 bars. Allow radio to play for 30 seconds.
- 4. Turn IGN OFF.
- 5. Check DTCs.
- 6. Did DTC reset?
  - a. Yes. Replace radio.
  - b. No. System working properly.

Description	Part Number	Qty.
DIGITAL TECHNICIAN II	HD-48650	1

The amplifier monitors the status of all its speaker circuits.

Many faults may occur that do not set a DTC. These faults are listed in **Table 2**. Verify no DTCs are present before addressing symptoms.

Table 1. Code Description

	<u> </u>
B1403	Speaker output DC offset
B1404	Internal thermal shutdown error
B1405	EQ correlation error
B1406	Invalid or missing EQ
B1410	Channel 1 speaker open
B1411	Channel 1 speaker shorted low
B1412	Channel 1 speaker shorted high
B1413	Channel 1 speaker shorted together
B1420	Channel 2 speaker open
B1421	Channel 2 speaker shorted low
B1422	Channel 2 speaker shorted high
B1423	Channel 2 speaker shorted together
B1430	Channel 3 speaker open
B1431	Channel 3 speaker shorted low
B1432	Channel 3 speaker shorted high
B1433	Channel 3 speaker shorted together
B1440	Channel 4 speaker open
B1441	Channel 4 speaker shorted low
B1442	Channel 4 speaker shorted high
B1443	Channel 4 speaker shorted together

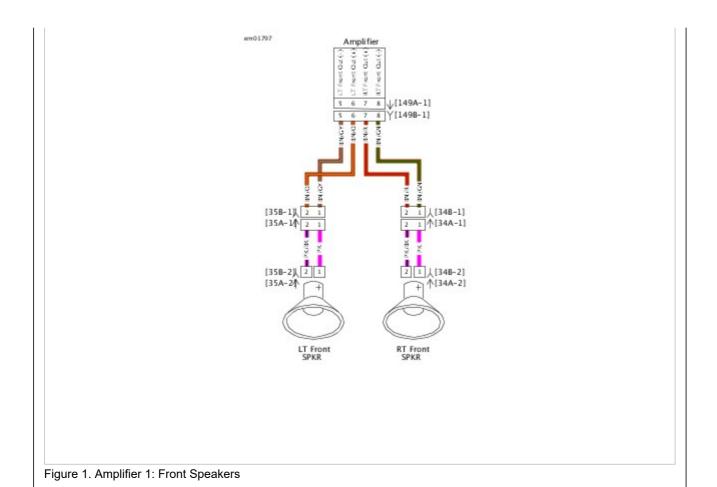
Table 2. Symptoms Description
All speakers inoperative
Left front speaker low or no audio
Both left speakers low or no audio
Left rear speaker pod low or no audio
Right front fairing speaker low or no audio
Both right speakers low or no audio

- Use DIGITAL TECHNICIAN II (Part Number: HD-48650) to retrieve amplifier DTCs.
- Before testing amplifier, remove amplifier fuse for 1 minute, install amplifier fuse and verify issue is still present.
- Verify that VOX is ON and set to midpoint when testing intercom.
- Check for radio software updates.

Right rear speaker pod low or no audio

- If radio is beeping with IGN ON and radio ON, use **DIGITAL TECHNICIAN II (Part Number: HD-48650)** to set regional code.
- If B1404 and or B1405 is set, the amplifier needs to be reflashed using **DIGITAL TECHNICIAN II (Part Number: HD-48650)**.

or additional informa	ation about the con	nectors in the fol	lowing diagram(s)	and diagnostic pro	cedure(s), see Ge	nera



# Table 1. DTC B1403, B1404 Diagnostic Faults Reset needed

- 1. Turn IGN OFF.
- 2. Remove amplifier fuse.
- 3. After waiting one minute, install amplifier fuse.
- 4. Turn IGN ON.
- 5. Clear DTCs.
- 6. Turn radio ON.
- 7. Adjust volume to 8 bars. Allow radio to play for 30 seconds.
- 8. Check DTCs.
- 9. Did DTC reset?
  - a. Yes. Replace amplifier.
  - b. **No.** System working properly.

Description	Part Number	Qty.
TEST CONNECTOR KIT	HD-41404	1
ADVANCED AUDIO SYSTEM BREAKOUT BOX	HD-47918	1

# Table 1. DTC B1410 Diagnostic Faults

Open speaker
Open wiring circuit

- 1. Turn IGN OFF.
- 2. Connect ADVANCED AUDIO SYSTEM BREAKOUT BOX (Part Number: HD-47918) between wiring harness [149B-1] and amplifier [149A-1].
- 3. Disconnect interconnect speaker [35-1].
- 4. Using **TEST CONNECTOR KIT (Part Number:HD-41404)**, test resistance between BOB terminal 5 and [35B-1] terminal 1 (BN/GY).
- 5. Is resistance less than 0.5 Ohm?
  - a. Yes. Go to Test 2.
  - b. No. Repair open between [149B-1] terminal 5 and [35B-1] terminal 1 (BN/GY).
- 1. Test resistance between BOB terminal 6 and [35B-1] terminal 2 (BN/O).
- 2. Is resistance less than 0.5 Ohm?
  - a. Yes. Go to Test 3.
  - b. No. Repair open between [149B-1] terminal 6 and [35B-1] terminal 2 (BN/O).
- 1. Disconnect speaker [35-2].
- 2. Test resistance between [35A-1] terminal 1 and [35B-2] terminal 1 (PK).
- 3. Is resistance less than 0.5 Ohm?
  - a. Yes. Go to Test 4.
  - b. No. Repair open between [35A-1] terminal 1 and [35B-2] terminal 1 (PK).

- 1. Test resistance between [35A-1] terminal 2 and [35B-2] terminal 2 (PK/BK).
- 2. Is resistance less than 0.5 Ohm?
  - a. Yes. Go to Test 5.
  - b. No. Repair open between [35A-1] terminal 2 and [35B-2] terminal 2 (PK/BK).
- 1. Test resistance between [35A-2] speaker terminals 1 and 2.
- 2. Is resistance approximately 2 Ohms?
  - a. Yes. Replace amplifier.
  - b. No. Replace speaker.

Description	Part Number	Qty.
TEST CONNECTOR KIT	HD-41404	1
ADVANCED AUDIO SYSTEM BREAKOUT BOX	HD-47918	1

Table 1.	DTC B1411	Diagnostic	Faults

Short to ground	l in speal	ker wires
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- 1. Turn IGN OFF.
- 2. Connect ADVANCED AUDIO SYSTEM BREAKOUT BOX (Part Number: HD-47918) to wiring harness [149B-1], leaving amplifier [149A-1] disconnected.
- 3. Using TEST CONNECTOR KIT (Part Number: HD-41404), test continuity between BOB terminal 5 and ground.
- 4. Is continuity present?
  - a. Yes. Go to Test 3.
  - b. No. Go to Test 2.
- 1. Test continuity between BOB terminal 6 and ground.
- 2. Is continuity present?
  - a. Yes. Go to Test 4.
  - b. No. Replace amplifier.
- 1. Disconnect interconnect speaker [35-1].
- 2. Test continuity between BOB terminal 5 and ground.
- 3. Is continuity present?
  - a. Yes. Repair short to ground between [149B-1] terminal 5 and [35B-1] terminal 1 (BN/GY).
  - b. No. Repair short to ground between [35A-1] terminal 1 and [35B-2] terminal 1 (PK).
- 1. Disconnect interconnect speaker [35-1].
- 2. Test continuity between BOB terminal 6 and ground.
- 3. Is continuity present?

- a. Yes. Repair short to ground between [149B-1] terminal 6 and [35B-1] terminal 2 (BN/O).
- b. **No.** Repair short to ground between [35A-1] terminal 2 and [35B-2] terminal 2 (PK/BK).

Description	Part Number	Qty.
TEST CONNECTOR KIT	HD-41404	1
ADVANCED AUDIO SYSTEM BREAKOUT BOX	HD-47918	1

Table 1	DTC B	1412	Diagnost	ic Faults

Short to voltage in speaker wires

- 1. Turn IGN OFF.
- 2. Connect ADVANCED AUDIO SYSTEM BREAKOUT BOX (Part Number: HD-47918) to wiring harness [149B-1] and amplifier [149A-1].
- 3. Turn IGN ON.
- 4. Turn radio ON.
- 5. Using TEST CONNECTOR KIT (Part Number: HD-41404), test voltage between BOB terminal 5 and ground.
- 6. Is battery voltage present?
  - a. Yes. Go to Test 3.
  - b. No. Go to Test 2.
- 1. Test voltage between BOB terminal 6 and ground.
- 2. Is battery voltage present?
  - a. Yes. Go to Test 4.
  - b. No. Replace amplifier.
- 1. Turn IGN OFF.
- 2. Disconnect interconnect speaker [35-1].
- 3. Turn IGN ON.
- 4. Test voltage between BOB terminal 5 and ground.
- 5. Is battery voltage present?
  - a. Yes. Repair short to voltage between [149B-1] terminal 5 and [35B-1] terminal 1 (BN/GY).
  - b. No. Repair short to voltage between [35A-1] terminal 1 and [35B-2] terminal 1 (PK).

- 1. Turn IGN OFF.
- 2. Disconnect interconnect speaker [35-1].
- 3. Turn IGN ON.
- 4. Test voltage between BOB terminal 6 and ground.
- 5. Is battery voltage present?
  - a. **Yes.** Repair short to voltage between [149B-1] terminal 6 and [35B-1] terminal 2 (BN/O).
  - b. No. Repair short to voltage between [35A-1] terminal 2 and [35B-2] terminal 2 (PK/BK).

Description	Part Number	Qty.
TEST CONNECTOR KIT	HD-41404	1
ADVANCED AUDIO SYSTEM BREAKOUT BOX	HD-47918	1

Table 1	<b>DTC B141</b>	3 Diagnostic	Faults
Table 1.	D 1 O D 1 T 1	o Diadriosiio	ı auıtə

Short in speaker wires	S

- 1. Turn IGN OFF.
- 2. Connect ADVANCED AUDIO SYSTEM BREAKOUT BOX (Part Number: HD-47918) to wiring harness [149B-1], leaving amplifier [149A-1] disconnected.
- 3. Disconnect interconnect speaker [35-1].
- 4. Using TEST CONNECTOR KIT (Part Number: HD-41404), test continuity between BOB terminals 5 and 6.
- 5. Is continuity present?
  - a. Yes. Repair short between [149B-1] terminals 5 and 6 and [35B-1] terminals 1 and 2.
  - b. No. Go to Test 2.
- 1. Disconnect speaker [35-2].
- 2. Test continuity between [35A-1] terminals 1 and 2.
- 3. Is continuity present?
  - a. Yes. Repair short between [35A-1] terminals 1 and 2 and [35B-2] terminals 1 and 2.
  - b. No. Go to Test 3.
- 1. Test resistance between [35A-2] speaker terminals 1 and 2.
- 2. Is resistance less than 2 Ohms?
  - a. Yes. Replace speaker.
  - b. No. Replace amplifier.

Description	Part Number	Qty.
TEST CONNECTOR KIT	HD-41404	1
ADVANCED AUDIO SYSTEM BREAKOUT BOX	HD-47918	1

Table 1	DTC R14	20 Diagnostic	Faults
Table 1.	010 D17	ZU Diadriosiic	, i auito

Open speaker
Open wiring circuit

- 1. Turn IGN OFF.
- 2. Connect ADVANCED AUDIO SYSTEM BREAKOUT BOX (Part Number: HD-47918) to wiring harness [149B-1] and amplifier [149A-1].
- 3. Disconnect interconnect speaker [34-1].
- 4. Using **TEST CONNECTOR KIT (Part Number:HD-41404)**, test resistance between BOB terminal 7 and [34B-1] terminal 2 (BN/R).
- 5. Is resistance less than 0.5 Ohm?
  - a. Yes. Go to Test 2.
  - b. No. Repair open between [149B-1] terminal 7 and [34B-1] terminal 2 (BN/R).
- 1. Test resistance between BOB terminal 8 and [34B-1] terminal 1 (BN/GN).
- 2. Is resistance less than 0.5 Ohm?
  - a. Yes. Go to Test 3.
  - b. No. Repair open between [149B-1] terminal 8 and [34B-1] terminal 1 (BN/GN).
- 1. Disconnect speaker [34-2].
- 2. Test resistance between [34A-1] terminal 1 and [34B-2] terminal 1 (PK).
- 3. Is resistance less than 0.5 Ohm?
  - a. Yes. Go to Test 4.
  - b. No. Repair open between [34A-1] terminal 1 and [34B-2] terminal 1 (PK).

- 1. Test resistance between [34A-1] terminal 2 and [34B-2] terminal 2 (PK/BK).
- 2. Is resistance less than 0.5 Ohm?
  - a. Yes. Go to Test 5.
  - b. No. Repair open between [34A-1] terminal 2 and [34B-2] terminal 2 (PK/BK).
- 1. Test resistance between [34A-2] speaker terminals 1 and 2.
- 2. Is resistance approximately 2 Ohms?
  - a. Yes. Replace amplifier.
  - b. No. Replace speaker.

Description	Part Number	Qty.
TEST CONNECTOR KIT	HD-41404	1
ADVANCED AUDIO SYSTEM BREAKOUT BOX	HD-47918	1

Table 1.	DTC B1421	Diagnostic	Faults

Short to ground i	in speaker	wires
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- 1. Turn IGN OFF.
- 2. Connect ADVANCED AUDIO SYSTEM BREAKOUT BOX (Part Number: HD-47918) to wiring harness [149B-1], leaving amplifier [149A-1] disconnected.
- 3. Using TEST CONNECTOR KIT (Part Number: HD-41404), test continuity between BOB terminal 7 and ground.
- 4. Is continuity present?
  - a. Yes. Go to Test 3.
  - b. No. Go to Test 2.
- 1. Test continuity between BOB terminal 8 and ground.
- 2. Is continuity present?
  - a. Yes. Go to Test 4.
  - b. No. Replace amplifier.
- 1. Disconnect interconnect speaker [34-1].
- 2. Test continuity between BOB terminal 7 and ground.
- 3. Is continuity present?
  - a. Yes. Repair short to ground between [149B-1] terminal 7 and [34B-1] terminal 2 (BN/R).
  - b. No. Repair short to ground between [34A-1] terminal 2 and [34B-2] terminal 2 (PK/BK).
- 1. Disconnect interconnect speaker [34-1].
- 2. Test continuity between BOB terminals 8 and ground.
- 3. Is continuity present?

- a. Yes. Repair short to ground between [149B-1] terminal 8 and [34B-1] terminal 1 (BN/GN).
- b. **No.** Repair short to ground between [34A-1] terminal 1 and [34B-2] terminal 1 (PK).

Description	Part Number	Qty.
TEST CONNECTOR KIT	HD-41404	1
ADVANCED AUDIO SYSTEM BREAKOUT BOX	HD-47918	1

Table 1.	DTC B1422	2 Diagnostic	Faults

Short to voltage in speaker wires

- 1. Turn IGN OFF.
- 2. Connect ADVANCED AUDIO SYSTEM BREAKOUT BOX (Part Number: HD-47918) between wiring harness [149B-1] and amplifier [149A-1].
- 3. Turn IGN ON.
- 4. Turn radio ON.
- 5. Using TEST CONNECTOR KIT (Part Number: HD-41404), test voltage between BOB terminal 7 and ground.
- 6. Is battery voltage present?
  - a. Yes. Go to Test 3.
  - b. No. Go to Test 2.
- 1. Test voltage between BOB terminal 8 and ground.
- 2. Is battery voltage present?
  - a. Yes. Go to Test 4.
  - b. No. Replace amplifier.
- 1. Turn IGN OFF.
- 2. Disconnect interconnect speaker [34-1].
- 3. Turn IGN ON.
- 4. Test voltage between BOB terminal 7 and ground.
- 5. Is battery voltage present?
  - a. Yes. Repair short to voltage between [149B-1] terminal 7 and [34B-1] terminal 2 (BN/R).
  - b. No. Repair short to voltage between [34A-1] terminal 2 and [34B-2] terminal 2 (PK/BK).

- 1. Turn IGN OFF.
- 2. Disconnect interconnect speaker [34-1].
- 3. Turn IGN ON.
- 4. Test voltage between BOB terminal 8 and ground.
- 5. Is battery voltage present?
  - a. Yes. Repair short to voltage between [149B-1] terminal 8 and [34B-1] terminal 1 (BN/GN).
  - b. No. Repair short to voltage between [34A-1] terminal 1 and [34B-2] terminal 1 (PK).

Description	Part Number	Qty.
TEST CONNECTOR KIT	HD-41404	1
ADVANCED AUDIO SYSTEM BREAKOUT BOX	HD-47918	1

Table 1. DTC B1423 Diagnostic Faults		
Short in speaker wires		

- 1. Turn IGN OFF.
- 2. Connect ADVANCED AUDIO SYSTEM BREAKOUT BOX (Part Number: HD-47918) to wiring harness [149B-1], leaving amplifier [149A-1] disconnected.
- 3. Disconnect interconnect speaker [34-1].
- 4. Using TEST CONNECTOR KIT (Part Number: HD-41404), test continuity between BOB terminal 7 and 8.
- 5. Is continuity present?
  - a. Yes. Repair short between [149B-1] terminals 7 and 8 and [34B-1] terminals 1 and 2.
  - b. No. Go to Test 2.
- 1. Disconnect speaker [34-2].
- 2. Test continuity between [34A-1] terminals 1 and 2.
- 3. Is continuity present?
  - a. Yes. Repair short between [34A-1] terminals 1 and 2 and [34B-2] terminals 1 and 2.
  - b. No. Go to Test 3.
- 1. Test resistance between [34A-2] speaker terminals 1 and 2.
- 2. Is resistance less than 2 Ohms?
  - a. Yes. Replace speaker.
  - b. No. Replace amplifier.

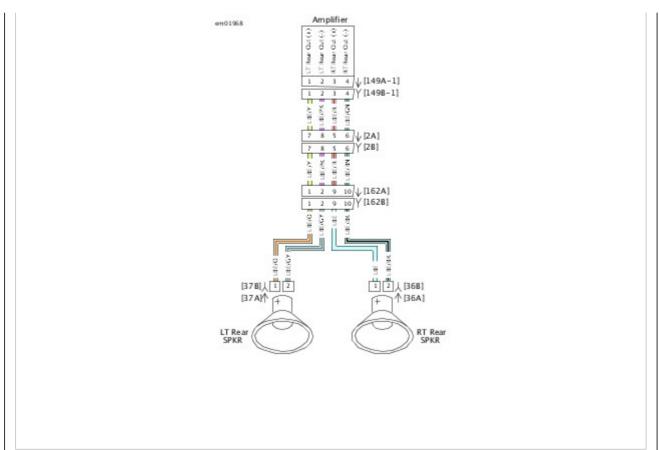


Figure 1. Amplifier 1: Rear Speaker Pods

Description	Part Number	Qty.
TEST CONNECTOR KIT	HD-41404	1
ADVANCED AUDIO SYSTEM BREAKOUT BOX	HD-47918	1

Table 1.	<b>DTC B1430</b>	Diagnostic	Faults
Table I.	DIC DI <del>11</del> 30	Diadilosiic	ı auıı

Open speaker
Open wiring circuit

- 1. Turn IGN OFF.
- 2. Connect ADVANCED AUDIO SYSTEM BREAKOUT BOX (Part Number: HD-47918) to wiring harness [149B-1] and amplifier [149A-1].
- 3. Disconnect Tour-Pak speaker pod [37].
- 4. Using **TEST CONNECTOR KIT (Part Number:HD-41404)**, test resistance between BOB terminal 1 and [37B] terminal 1 (LBE/O).
- 5. Is resistance less than 0.5 ohm?
  - a. Yes. Go to Test 4.
  - b. No. Go to Test 2.
- 1. Disconnect rear audio [162].
- 2. Test resistance between BOB terminal 1 and [162A] terminal 1 (LBE/Y).
- 3. Is resistance less than 0.5 ohm?
  - a. Yes. Repair open between [162B] terminal 1 and [37B] terminal 1 (LBE/O).
  - b. No. Go to Test 3.
- 1. Disconnect fairing [2].
- 2. Test resistance between BOB terminal 1 and [2A] terminal 7 (LBE/Y).
- 3. Is resistance less than 0.5 ohm?
  - a. Yes. Repair open between [162A] terminal 1 and [2B] terminal 7 (LBE/Y).
  - b. No. Repair open between [2A] terminal 7 and [149B-1] terminal 1 (LBE/Y).

- 1. Test resistance between BOB terminal 2 and [37B] terminal 2 (LBE/GY).
- 2. Is resistance less than 0.5 ohm?
  - a. Yes. Go to Test 7.
  - b. No. Go to Test 5.
- 1. Disconnect rear audio [162].
- 2. Test resistance between BOB terminal 2 and [162A] terminal 2 (LBE/PK).
- 3. Is resistance less than 0.5 ohm?
  - a. Yes. Repair open between [162B] terminal 2 and [37B] terminal 2 (LBE/GY).
  - b. No. Go to Test 6.
- 1. Disconnect fairing [2].
- 2. Test resistance between BOB terminal 2 and [2A] terminal 8 (LBE/PK).
- 3. Is resistance less than 0.5 ohm?
  - a. Yes. Repair open between [162A] terminal 2 and [2B] terminal 8 (LBE/PK).
  - b. No. Repair open between [2A] terminal 8 and [149B-1] terminal 2 (LBE/PK).
- 1. Test resistance between [37A] speaker terminals 1 and 2.
- 2. Is resistance approximately 2 ohms?
  - a. Yes. Replace amplifier.
  - b. No. Replace speaker.

Description	Part Number	Qty.
TEST CONNECTOR KIT	HD-41404	1
ADVANCED AUDIO SYSTEM BREAKOUT BOX	HD-47918	1

Table 1.	DTC B1431	Diagnostic	Faults
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Short to ground in speaker wires

- 1. Turn IGN OFF.
- 2. Connect ADVANCED AUDIO SYSTEM BREAKOUT BOX (Part Number: HD-47918) to wiring harness [149B-1], leaving amplifier [149A-1] disconnected.
- 3. Using TEST CONNECTOR KIT (Part Number: HD-41404), test continuity between BOB terminal 1 and ground.
- 4. Is continuity present?
  - a. Yes. Go to Test 2.
  - b. No. Go to Test 4.
- 1. Disconnect rear audio [162].
- 2. Test continuity between BOB terminal 1 and ground.
- 3. Is continuity present?
  - a. Yes. Go to Test 3.
  - b. No. Repair short to ground between [162B] terminal 1 and [37B] terminal 1 (LBE/O).
- 1. Disconnect fairing [2].
- 2. Test continuity between BOB terminal 1 and ground.
- 3. Is continuity present?
  - a. Yes. Repair short to ground between [2A] terminal 7 and [149B-1] terminal 1 (LBE/Y).
  - b. No. Repair short to ground between [162A] terminal 1 and [2B] terminal 7 (LBE/Y).
- 1. Test continuity between BOB terminal 2 and ground.
- 2. Is continuity present?

- a. Yes. Go to Test 5.
- b. No. Replace amplifier.
- 1. Disconnect rear audio [162].
- 2. Test continuity between BOB terminal 2 and ground.
- 3. Is continuity present?
  - a. Yes. Go to Test 6.
  - b. **No.** Repair short to ground between [162B] terminal 2 and [37B] terminal 2 (LBE/GY).
- 1. Disconnect fairing [2].
- 2. Test continuity between BOB terminal 2 and ground.
- 3. Is continuity present?
  - a. **Yes.** Repair short to ground between [2A] terminal 8 [149B-1] terminal 2 (LBE/PK).
  - b. No. Repair short to ground between [162A] terminal 2 and [2B] terminal 8 (LBE/PK).

Description	Part Number	Qty.
TERMINAL EXTRACTOR	B-50085	1
TEST CONNECTOR KIT	HD-41404	1
ADVANCED AUDIO SYSTEM BREAKOUT BOX	HD-47918	1

Table 1. DTC B1432 Diagnostic Fau	lts
Short to voltage in speaker wires	

- 1. Turn IGN OFF.
- 2. Connect ADVANCED AUDIO SYSTEM BREAKOUT BOX (Part Number: HD-47918) between wiring harness [149B-1] and amplifier [149A-1].
- 3. Turn IGN ON.
- 4. Turn radio ON.
- 5. Using TEST CONNECTOR KIT (Part Number: HD-41404), test continuity between BOB terminal 1 and ground.
- 6. Is battery voltage present?
  - a. Yes. Go to Test 2.
  - b. No. Go to Test 5.
- 1. Turn IGN OFF.
- 2. Disconnect rear audio [162].
- 3. Turn IGN ON.
- 4. Test voltage between BOB terminal 1 and ground.
- 5. Is battery voltage present?
  - a. Yes. Go to Test 3.
  - b. No. Repair short to voltage between [162B] terminal 1 and [37B] terminal 1 (LBE/O).
- 1. Turn IGN OFF.
- 2. Disconnect fairing [2].
- 3. Turn IGN ON.
- 4. Test voltage between BOB terminal 1 and ground.
- 5. Is battery voltage present?

- a. Yes. Go to Test 4.
- b. No. Repair short to voltage between [162A] terminal 1 and [2B] terminal 7 (LBE/Y).
- 1. Turn IGN OFF.
- 2. Disconnect [149B-1].
- 3. Using TERMINAL EXTRACTOR (Part Number: B-50085), remove terminal 1 from [149B-1] (LBE/O).
- 4. Connect [149B-1] to BOB.
- 5. Turn IGN ON.
- 6. Test voltage between BOB terminal 1 and ground.
- 7. Is voltage greater than 9.0V?
  - a. Yes. Replace amplifier.
  - b. **No.** Repair short to ground between [149B-1] terminal 1 and [2A] terminal 7 (LBE/Y).
- 1. Test voltage between BOB terminal 2 and ground.
- 2. Is battery voltage present?
  - a. Yes. Go to Test 6.
  - b. No. Replace amplifier.
- 1. Turn IGN OFF.
- 2. Disconnect rear audio [162].
- 3. Turn IGN ON.
- 4. Test voltage between BOB terminal 2 and ground.
- 5. Is battery voltage present?
  - a. Yes. Go to Test 7.
  - b. No. Repair short to voltage between [162B] terminal 2 and [37B] terminal 2 (LBE/GY).
- 1. Turn IGN OFF.
- 2. Disconnect fairing [2].
- 3. Turn IGN ON.
- 4. Test voltage between BOB terminal 2 and ground.
- 5. Is battery voltage present?
  - a. Yes. Go to Test 8.
  - b. No. Repair short to voltage between [162A] terminal 2 and [2B] terminal 8 (LBE/PK).
- 1. Turn IGN OFF.
- 2. Disconnect [149B-1].

- 3. Using TERMINAL EXTRACTOR (Part Number:B-50085), remove terminal 2 from [149B-1] (LBE/PK).
- 4. Connect [149B-1] to BOB.
- 5. Turn IGN ON.
- 6. Test voltage between BOB terminal 2 and ground.
- 7. Is voltage greater than 9.0V?
  - a. Yes. Replace amplifier.
  - b. No. Repair short to ground between [149B-1] terminal 2 and [2A] terminal 8 (LBE/PK).

Description	Part Number	Qty.
TEST CONNECTOR KIT	HD-41404	1
ADVANCED AUDIO SYSTEM BREAKOUT BOX	HD-47918	1

Table 1.	DTC B1433	Diagnostic	Faults
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Shorted speaker wires

- 1. Turn IGN OFF.
- 2. Connect ADVANCED AUDIO SYSTEM BREAKOUT BOX (Part Number: HD-47918) to wiring harness [149B-1], leaving amplifier [149A-1] disconnected.
- 3. Disconnect left speaker pod [37].
- 4. Using TEST CONNECTOR KIT (Part Number: HD-41404), test continuity between BOB terminals 1 and 2.
- 5. Is continuity present?
  - a. Yes. Go to Test 2.
  - b. No. Go to Test 4.
- 1. Disconnect rear audio [162].
- 2. Test continuity between BOB terminals 1 and 2.
- 3. Is continuity present?
  - a. Yes. Go to Test 3.
  - b. No. Repair short between [162B] terminals 1 and 2 and [37B] terminals 1 and 2.
- 1. Disconnect fairing [2].
- 2. Test continuity between BOB terminals 1 and 2.
- 3. Is continuity present?
  - a. Yes. Repair short between [2A] terminals 7 and 8 and [149B-1] terminals 1 and 2.
  - b. No. Repair short between [162A] terminals 1 and 2 and [2B] terminals 7 and 8.
- 1. Test resistance between speaker [37A] terminals 1 and 2.

- 2. Is resistance less than 2 Ohms?
  - a. Yes. Replace speaker.
  - b. No. Replace amplifier.

Description	Part Number	Qty.
TEST CONNECTOR KIT	HD-41404	1
ADVANCED AUDIO SYSTEM BREAKOUT BOX	HD-47918	1

Table 1	<b>DTC B1440</b>	Diagnostic	Faults
Table 1.	D 1 O D 1 T T O	Diadilosiic	i auito

Open speaker
Open wiring circuit

- 1. Turn IGN OFF.
- 2. Connect ADVANCED AUDIO SYSTEM BREAKOUT BOX (Part Number: HD-47918) to wiring harness [149B-1] and amplifier [149A-1].
- 3. Disconnect Tour-Pak speaker pod [36].
- 4. Using **TEST CONNECTOR KIT (Part Number:HD-41404)**, test resistance between BOB terminal 3 and [36B] terminal 1 (LBE).
- 5. Is resistance less than 0.5 ohm?
  - a. Yes. Go to Test 4.
  - b. No. Go to Test 2.
- 1. Disconnect rear audio [162].
- 2. Test resistance between BOB terminal 3 and [162A] terminal 9 (LBE/R).
- 3. Is resistance less than 0.5 ohm?
  - a. Yes. Repair open between [162B] terminal 9 and [36B] terminal 1 (LBE).
  - b. No. Go to Test 3.
- 1. Disconnect fairing [2].
- 2. Test resistance between BOB terminal 3 and [2A] terminal 5 (LBE/R).
- 3. Is resistance less than 0.5 ohm?
  - a. Yes. Repair open between [162A] terminal 9 and [2B] terminal 5 (LBE/R).
  - b. No. Repair open between [2A] terminal 5 and [149B-1] terminal 3 (LBE/R).

- 1. Test resistance between BOB terminal 4 and [36B] terminal 2 (LBE/GN).
- 2. Is resistance less than 0.5 ohm?
  - a. Yes. Go to Test 7.
  - b. No. Go to Test 5.
- 1. Disconnect rear audio [162B].
- 2. Test resistance between BOB terminal 4 and [162A] terminal 10 (LBE/GN).
- 3. Is resistance less than 0.5 ohm?
  - a. Yes. Repair open between [162B] terminal 10 and [36B] terminal 2 (LBE/BK).
  - b. No. Go to Test 6.
- 1. Disconnect fairing [2].
- 2. Test resistance between BOB terminal 4 and [2A] terminal 6 (LBE/GN).
- 3. Is resistance less than 0.5 ohm?
  - a. Yes. Repair open between [162A] terminal 10 and [2B] terminal 6 (LBE/GN).
  - b. No. Repair open between [2A] terminal 6 and [149B-1] terminal 4 (LBE/GN).
- 1. Test resistance between [36A] speaker terminals 1 and 2.
- 2. Is resistance approximately 2 ohms?
  - a. Yes. Replace amplifier.
  - b. No. Replace speaker.

Description	Part Number	Qty.
TEST CONNECTOR KIT	HD-41404	1
ADVANCED AUDIO SYSTEM BREAKOUT BOX	HD-47918	1

Table 1.	DTC B1441	Diagnostic	<b>Faults</b>
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Short to ground in speaker wires

- 1. Turn IGN OFF.
- 2. Connect ADVANCED AUDIO SYSTEM BREAKOUT BOX (Part Number: HD-47918) to wiring harness [149B-1], leaving amplifier [149A-1] disconnected.
- 3. Using TEST CONNECTOR KIT (Part Number: HD-41404), test continuity between BOB terminal 3 and ground.
- 4. Is continuity present?
  - a. Yes. Go to Test 2.
  - b. No. Go to Test 4.
- 1. Disconnect rear audio [162].
- 2. Test continuity between BOB terminal 3 and ground.
- 3. Is continuity present?
  - a. Yes. Go to Test 3.
  - b. No. Repair short to ground between [162B] terminal 9 and [36B] terminal 1 (LBE).
- 1. Disconnect fairing [2].
- 2. Test continuity between BOB terminal 3 and ground.
- 3. Is continuity present?
  - a. Yes. Repair short to ground between [2A] terminal 5 and [149B-1] terminal 3 (LBE/R).
  - b. No. Repair short to ground between [162A] terminal 9 and [2B] terminal 5 (LBE/R).
- 1. Test continuity between BOB terminal 4 and ground.
- 2. Is continuity present?

- a. Yes. Go to Test 5.
- b. No. Replace amplifier.
- 1. Disconnect rear audio [162].
- 2. Test continuity between BOB terminal 4 and ground.
- 3. Is continuity present?
  - a. Yes. Go to Test 6.
  - b. No. Repair short to ground between [162B] terminal 10 and [36B] terminal 2 (LBE/BK).
- 1. Disconnect fairing [2].
- 2. Test continuity between BOB terminal 4 and ground.
- 3. Is continuity present?
  - a. Yes. Repair short to ground between [2A] terminal 6 and [149B-1] terminal 4 (LBE/GN).
  - b. No. Repair short to ground between [162A] terminal 10 and [2B] terminal 6 (LBE/GN).

Description	Part Number	Qty.
TERMINAL EXTRACTOR	B-50085	1
TEST CONNECTOR KIT	HD-41404	1
ADVANCED AUDIO SYSTEM BREAKOUT BOX	HD-47918	1

Table 1. DTC B1442 Diagnostic Fault		
Short to voltage in speaker wires		

- 1. Turn IGN OFF.
- 2. Connect ADVANCED AUDIO SYSTEM BREAKOUT BOX (Part Number: HD-47918) to wiring harness [149B-1] and amplifier [149A-1].
- 3. Turn IGN ON.
- 4. Turn radio ON.
- 5. Using TEST CONNECTOR KIT (Part Number: HD-41404), test voltage between BOB terminal 3 and ground.
- 6. Is battery voltage present?
  - a. Yes.
  - b. **No.**
- 1. Turn IGN OFF.
- 2. Disconnect rear audio [162].
- 3. Turn IGN ON.
- 4. Test voltage between BOB terminal 3 and ground.
- 5. Is battery voltage present?
  - a. Yes.
  - b. No. Repair short to voltage between [162B] terminal 9 and [36B] terminal 1 (LBE).
- 1. Turn IGN OFF.
- 2. Disconnect fairing [2].
- 3. Turn IGN ON.
- 4. Test voltage between BOB terminal 3 and ground.
- 5. Is battery voltage present?

- a. Yes.
- b. No. Repair short to voltage between [162A] terminal 9 and [2B] terminal 5 (LBE/R).
- 1. Turn IGN OFF.
- 2. Disconnect [149B-1].
- 3. Using TERMINAL EXTRACTOR (Part Number: B-50085), remove terminal 3 from [149B-1] (LBE/R).
- 4. Connect [149B-1] to BOB.
- 5. Turn IGN ON.
- 6. Test voltage between BOB terminal 3 and ground.
- 7. Is voltage greater than 9.0V?
  - a. Yes. Replace amplifier.
  - b. **No.** Repair short to voltage between [149B-1] terminal 3 and [2A] terminal 5 (LBE).
- 1. Test voltage between BOB terminal 4 and ground.
- 2. Is battery voltage present?
  - a. Yes.
  - b. No. Replace amplifier.
- 1. Turn IGN OFF.
- 2. Disconnect rear audio [162].
- 3. Turn IGN ON.
- 4. Test voltage between BOB terminal 4 and ground.
- 5. Is battery voltage present?
  - a. Yes.
  - b. No. Repair short to voltage between [162B] terminal 10 and [36B] terminal 2 (LBE/BK).
- 1. Turn IGN OFF.
- 2. Disconnect fairing [2].
- 3. Turn IGN ON.
- 4. Test voltage between BOB terminal 4 and ground.
- 5. Is battery voltage present?
  - a. Yes.
  - b. No. Repair short to voltage between [162A] terminal 10 and [2B] terminal 6 (LBE/GN).
- 1. Turn IGN OFF.
- 2. Disconnect [149B-1].

- 3. Using TERMINAL EXTRACTOR (Part Number:B-50085), remove terminal 4 from [149B-1] (LBE/GN).
- 4. Connect [149B-1] to BOB.
- 5. Turn IGN ON.
- 6. Test voltage between BOB terminal 4 and ground.
- 7. Is voltage greater than 9.0V?
  - a. Yes. Replace amplifier.
  - b. **No.** Repair short to voltage between [149B-1] terminal 4 and [2A] terminal 6 (LBE/GN).

Description	Part Number	Qty.
TEST CONNECTOR KIT	HD-41404	1
ADVANCED AUDIO SYSTEM BREAKOUT BOX	HD-47918	1

Table 1.	DTC B1443	Diagnostic	Faults
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Shorted spea	ker wires

- 1. Turn IGN OFF.
- 2. Connect ADVANCED AUDIO SYSTEM BREAKOUT BOX (Part Number: HD-47918) to wiring harness [149B-1], leaving amplifier [149A-1] disconnected.
- 3. Disconnect right speaker pod [36].
- 4. Using TEST CONNECTOR KIT (Part Number: HD-41404), test continuity between BOB terminals 3 and 4.
- 5. Is continuity present?
  - a. Yes. Go to Test 2.
  - b. No. Go to Test 4.
- 1. Disconnect rear audio [162].
- 2. Test continuity between BOB terminals 3 and 4.
- 3. Is continuity present?
  - a. Yes. Go to Test 3.
  - b. No. Repair short between [162B] terminals 9 and 10 and [36B] terminals 1 and 2.
- 1. Disconnect fairing [2].
- 2. Test continuity between BOB terminal 3 and 4.
- 3. Is continuity present?
  - a. Yes. Repair short between [2A] terminals 5 and 6 and [149B-1] terminals 3 and 4.
  - b. No. Repair short between [162A] terminals 9 and 10 and [2B] terminals 5 and 6.
- 1. Test resistance between [36A] speaker terminals 1 and 2.

- 2. Is resistance less than 2 Ohms?
  - a. Yes. Replace speaker.
  - b. No. Replace amplifier.

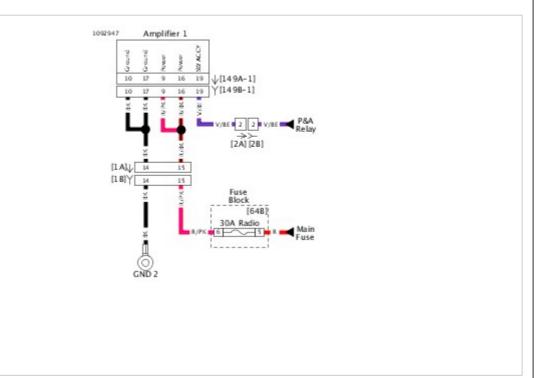


Figure 1. Amplifier Power Circuit

Radio

| Composition | Composi

Figure 2. Radio and Amplifier 1 Circuit

Description	Part Number	Qty.
TEST CONNECTOR KIT	HD-41404	1
ADVANCED AUDIO SYSTEM BREAKOUT BOX	HD-47918	1

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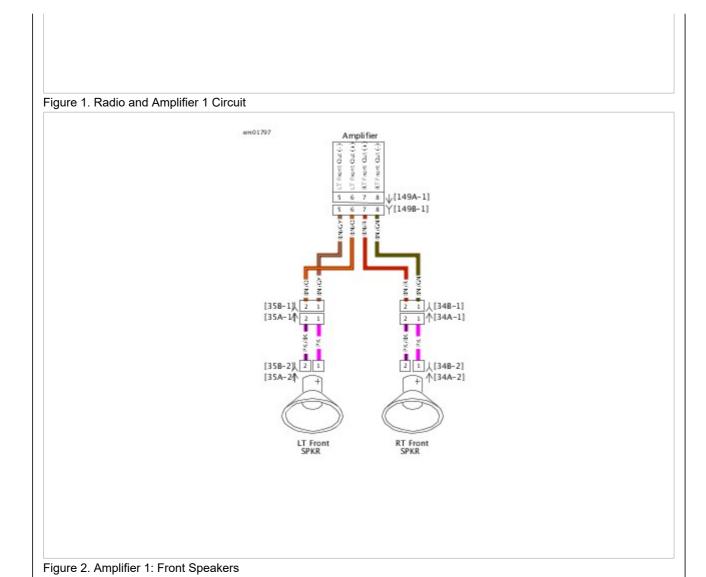
Shorted to ground circuit wires
Open circuit wires

- 1. Turn radio ON.
- 2. Does radio turn ON?
  - a. Yes. Go to Test 2.
  - b. No. See audio system in the electrical diagnostic manual.
- 1. Turn IGN OFF.
- 2. Connect ADVANCED AUDIO SYSTEM BREAKOUT BOX (Part Number: HD-47918) between wiring harness [149B-1] and amplifier [149A-1].
- 3. Using TEST CONNECTOR KIT (Part Number: HD-41404), test voltage between BOB terminal 9 and ground.
- 4. Is battery voltage present?
  - a. Yes. Go to Test 3.
  - b. No. Repair open between [149-1] terminal 9 and battery (R).
- 1. Test voltage between BOB terminal 16 and ground.
- 2. Is battery voltage present?
  - a. Yes. Go to Test 4.
  - b. No. Repair open between [149-1] terminal 16 and battery (R).
- 1. Test resistance between BOB terminal 10 and ground.
- 2. Is resistance less than 0.5 Ohm?

- a. Yes. Go to Test 5.
- b. No. Repair open between [149-1] terminal 10 and ground (BK).
- 1. Test resistance between BOB terminal 17 and ground.
- 2. Is resistance less than 0.5 Ohm?
  - a. Yes. Go to Test 6.
  - b. No. Repair open between [149-1] terminal 17 and ground (BK).
- 1. Turn IGN ON.
- 2. Test voltage between BOB terminal 19 and ground.
- 3. Is battery voltage present?
  - a. Yes. Remove BOB. Go to Test 7.
  - b. No. Repair open between [149-1] terminal 19 and P&A relay (V/BE).
- 1. Turn IGN OFF.
- 2. Disconnect [149B-1] from BOB.
- 3. Connect a known good amplifier to [149B-1].
- 4. Turn IGN ON.
- 5. Adjust volume to 3 bars. Are all speakers inoperative?

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- a. Yes. Replace radio.
- b. No. Replace amplifier.



Description	Part Number	Qty.
TERMINAL EXTRACTOR	B-50085	1
TEST CONNECTOR KIT	HD-41404	1
ADVANCED AUDIO SYSTEM BREAKOUT BOX	HD-47918	1
BREAKOUT BOX	HD-50390-1	1
BCM CABLE	HD-50390-2	1
BCM OVERLAY	HD-50390-2-P	1

## Table 1. Left Front Fairing Speaker Inoperative Diagnostic Faults

Shorted together circuit wires
Shorted to ground circuit wires
Shorted to voltage circuit wires
Open circuit wires
Shorted speaker
Open speaker

- 1. Turn IGN OFF.
- 2. Connect BREAKOUT BOX (Part Number:HD-50390-1) and BCM CABLE (Part Number:HD-50390-2) to wiring harness [27B], leaving radio [27A] disconnected.
- 3. Verify BCM OVERLAY (Part Number: HD-50390-2-P) is in position on BOB.
- 4. Using TEST CONNECTOR KIT (Part Number: HD-41404), test continuity between BOB terminals L1 and L2.
- 5. Is continuity present?
  - a. Yes. Go to Test 6.
  - b. No. Go to Test 2.
- 1. Connect ADVANCED AUDIO SYSTEM BREAKOUT BOX (Part Number: HD-47918) to wiring harness [149B-1], leaving amplifier [149A-1] disconnected.
- 2. Test continuity between radio BOB terminal L1 and amplifier BOB terminal 20.

- 3. Is continuity present?
  - a. Yes. Go to Test 4.
  - b. No. Go to Test 3.
- 1. Disconnect fairing [2].
- 2. Test resistance between radio BOB terminal L1 and [2B] terminal 12 (PK/GY).
- 3. Is resistance less than 0.5 Ohm?
  - a. Yes. Repair open between [149B-1] terminal 20 and [2A] terminal 12 (PK/GY).
  - b. No. Repair open between [2B] terminal 12 and [27B] terminal L1 (PK/GY).
- 1. Test resistance between radio BOB terminal L2 and amplifier BOB terminal 21.
- 2. Is resistance less than 0.5 Ohm?
  - a. Yes. Replace amplifier.
  - b. No. Go to Test 5.
- 1. Disconnect fairing [2].
- 2. Test resistance between radio BOB terminal L2 and [2B] terminal 11 (PK/O).
- 3. Is resistance less than 0.5 Ohm?
  - a. Yes. Repair open between [149B-1] terminal 21 and [2A] terminal 11 (PK/O).
  - b. No. Repair open between [2B] terminal 11 and [27B] terminal L2 (PK/O).
- 1. Turn IGN OFF.
- 2. Remove radio BOB and connect [27].
- 3. Connect ADVANCED AUDIO SYSTEM BREAKOUT BOX (Part Number: HD-47918) to wiring harness [149B-1], leaving amplifier [149A-1] disconnected.
- 4. Test resistance between BOB terminals 5 and 6.
- 5. Is resistance less than 2 Ohms?
  - a. Yes. Go to Test 7.
  - b. No. Go to Test 9.
- 1. Disconnect speaker harness [35-1].
- 2. Test continuity between BOB terminals 5 and 6.
- 3. Is continuity present?
  - a. Yes. Repair short between [35B-1] terminals 1 and 2 and [149B-1] terminals 5 and 6.
  - b. No. Go to Test 8.

- 1. Disconnect speaker [35-2].
- 2. Test resistance between [35A-2] speaker terminals 1 and 2.
- 3. Is resistance less than 2 Ohms?
  - a. Yes. Replace speaker.
  - b. No. Repair short between [35A-1] terminals 1 and 2 and [35B-2] terminals 1 and 2.
- 1. Test continuity between BOB terminals 5 and 6.
- 2. Is continuity present?
  - a. Yes. Go to Test 14.
  - b. No. Go to Test 10.
- 1. Disconnect speaker harness [35-1].
- 2. Test resistance between BOB terminal 5 and [35B-1] terminal 1 (BN/GY).
- 3. Is resistance less than 0.5 Ohm?
  - a. Yes. Go to Test 11.
  - b. No. Repair open between [35B-1] terminal 1 and [149B-1] terminals 5 (BN/GY).
- 1. Test resistance between BOB terminals 6 and [35B-1] terminal 2 (BN/O).
- 2. Is resistance less than 0.5 Ohm?
  - a. Yes. Go to Test 12.
  - b. No. Repair open between [35B-1] terminal 2 and [149B-1] terminal 6 (BN/O).
- 1. Disconnect speaker [35-2].
- 2. Test resistance between [35A-1] terminal 1 and [35B-2] terminal 1 (PK).
- 3. Is resistance less than 0.5 Ohm?
  - a. Yes. Go to Test 13.
  - b. No. Repair open between [35B-2] terminal 1 and [35A-1] terminal 1 (PK).
- 1. Test resistance between [35A-1] terminal 2 and [35B-2] terminal 2 (PK/BK).
- 2. Is resistance less than 0.5 Ohm?
  - a. Yes. Replace speaker.
  - b. No. Repair open between [35B-2] terminal 2 and [35A-1] terminal 2 (PK/BK).

- 1. Test continuity between BOB terminal 5 and ground.
- 2. Is continuity present?
  - a. Yes. Go to Test 15.
  - b. No. Go to Test 16.
- 1. Disconnect speaker harness [35-1].
- 2. Test continuity between terminal 5 and ground.
- 3. Is continuity present?
  - a. Yes. Repair short to ground between [35B-1] terminal 1 and [149B-1] terminal 5 (BN/GY).
  - b. No. Repair short to ground between [35A-1] terminal 1 and [35B-2] terminal 1 (PK).
- 1. Test continuity between BOB terminal 6 and ground.
- 2. Is continuity present?
  - a. Yes. Go to Test 17.
  - b. No. Go to Test 18.
- 1. Disconnect speaker harness [35B-1].
- 2. Test continuity between terminal 6 and ground.
- 3. Is continuity present?
  - a. Yes. Repair short to ground between [35B-1] terminal 2 and [149B-1] terminal 6 (BN/O).
  - b. No. Repair short to ground between [35A-1] terminal 2 and [35B-2] terminal 2 (PK/BK).
- 1. Connect [149A-1].
- 2. Turn IGN ON.
- 3. Test voltage between BOB terminals 5 and ground.
- 4. Is voltage greater than 9.0V?
  - a. Yes. Go to Test 19.
  - b. No. Go to Test 21.
- 1. Disconnect speaker harness [35-1].
- 2. Test voltage between BOB terminal 5 and ground.
- 3. Is voltage greater than 9.0V?

- a. Yes. Go to Test 20.
- b. No. Repair short to voltage between [35A-1] terminal 1 and [35B-2] terminal 1 (PK).
- 1. Turn IGN OFF.
- 2. Disconnect [149B-1].
- 3. Using TERMINAL EXTRACTOR (Part Number: B-50085), remove terminal 5 from [149B-1] (BN/GY).
- 4. Connect [149B-1].
- 5. Turn IGN ON.
- 6. Test voltage between BOB terminal 5 and ground.
- 7. Is voltage greater than 9.0V?
  - a. Yes. Replace amplifier.
  - b. No. Repair short to voltage between [35B-1] terminal 1 and [149B-1] terminal 5 (BN/GY).
- 1. Test voltage between BOB terminal 6 and ground.
- 2. Is voltage greater than 9.0V?
  - a. Yes. Go to Test 22.
  - b. No. Go to Test 24.
- 1. Disconnect speaker harness [35-1].
- 2. Test voltage between BOB terminal 6 and ground.
- 3. Is voltage greater than 9.0V?
  - a. Yes. Go to Test 23.
  - b. No. Repair short to voltage between [35A-1] terminal 2 and [35B-2] terminal 2 (PK/BK).
- 1. Turn IGN OFF.
- 2. Disconnect [149B-1].
- 3. Using TERMINAL EXTRACTOR (Part Number: B-50085), remove terminal 6 from [149B-1] (BN/O).
- 4. Connect [149B-1].
- 5. Turn IGN ON.
- 6. Test voltage between BOB terminal 6 and ground.
- 7. Is voltage greater than 9.0V?
  - a. Yes. Replace amplifier.
  - b. No. Repair short to voltage between [35B-1] terminal 1 and [149B-1] terminal 6 (BN/O).
- 1. Turn IGN OFF.
- 2. Disconnect [149B-1] from BOB.

- 3. Connect a known good amplifier to [149B-1].
- 4. Turn IGN ON.
- 5. With volume at 3 bars is front left speaker inoperative?
  - a. Yes. Replace radio.
  - b. No. Replace amplifier.

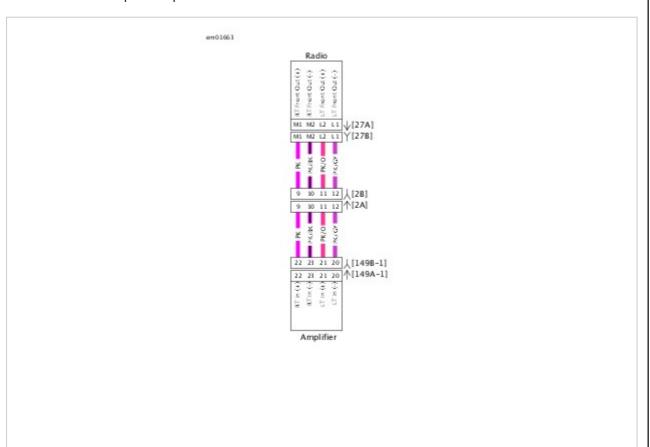


Figure 1. Radio and Amplifier 1 Circuit

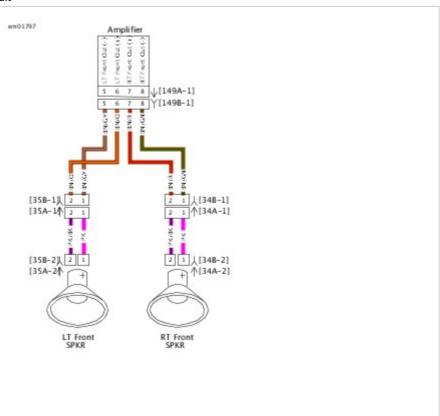


Figure 2. Amplifier 1: Front Speakers

Description	Part Number	Qty.
TEST CONNECTOR KIT	HD-41404	1
ADVANCED AUDIO SYSTEM BREAKOUT BOX	HD-47918	1
BREAKOUT BOX	HD-50390-1	1
BCM CABLE	HD-50390-2	1
BCM OVERLAY	HD-50390-2-P	1

Table 1. Both Left Speakers Inoperative Diagnostic Faults

Circuit wires shorted together
Circuit wires shorted to ground
Circuit wires shorted to voltage
Open circuit wires

- 1. Turn IGN OFF.
- 2. Connect BREAKOUT BOX (Part Number:HD-50390-1) and BCM CABLE (Part Number:HD-50390-2) to wiring harness [27B], leaving radio [27A] disconnected.
- 3. Verify BCM OVERLAY (Part Number: HD-50390-2-P) is in position on BOB.
- 4. Using TEST CONNECTOR KIT (Part Number: HD-41404), test continuity between BOB terminals L1 and L2.
- 5. Is continuity present?
  - a. Yes. Go to Test 6.
  - b. No. Go to Test 2.
- 1. Connect **ADVANCED AUDIO SYSTEM BREAKOUT BOX (Part Number: HD-47918)** to wiring harness [149B-1], leaving amplifier [149A-1] disconnected.
- 2. Test resistance between radio BOB terminal L1 and amplifier BOB terminal 20.
- 3. Is resistance less than 0.5 Ohm?
  - a. Yes. Go to Test 4.
  - b. No. Go to Test 3.

- 1. Disconnect fairing [2].
- 2. Test resistance between radio BOB terminal L1 and [2B] terminal 12 (PK/GY).
- 3. Is resistance less than 0.5 Ohm?
  - a. Yes. Repair open between [149B-1] terminal 20 and [2A] terminal 12 (PK/GY).
  - b. No. Repair open between [2B] terminal 12 and [27B] terminal L1 (PK/GY).
- 1. Test resistance between radio BOB terminal L2 and amplifier BOB terminal 21.
- 2. Is resistance less than 0.5 Ohm?
  - a. Yes. Replace amplifier.
  - b. No. Go to Test 5.
- 1. Disconnect fairing [2].
- 2. Test resistance between radio BOB terminal L2 and [2B] terminal 11 (PK/O).
- 3. Is resistance less than 0.5 Ohm?
  - a. Yes. Repair open between [149B-1] terminal 21 and [2A] terminal 11 (PK/O).
  - b. No. Repair open between [2B] terminal 11 and [27B] terminal L2 (PK/O).
- 1. Turn IGN OFF.
- 2. Disconnect [149B-1] from BOB.
- 3. Connect a known good amplifier to [149B-1].
- 4. Turn IGN ON.
- 5. Adjust volume to 3 bars. Are both left speakers inoperative?
  - a. Yes. Replace radio.
  - b. No. Replace amplifier.

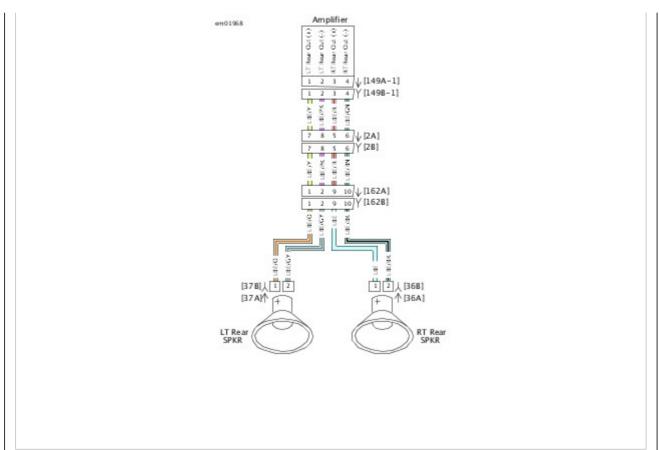


Figure 1. Amplifier 1: Rear Speaker Pods

Description	Part Number	Qty.
TERMINAL EXTRACTOR	B-50085	1
TEST CONNECTOR KIT	HD-41404	1
ADVANCED AUDIO SYSTEM BREAKOUT BOX	HD-47918	1

# Table 1. Left Speaker Pod Inoperative Diagnostic Faults

Shorted together circuit wires
Shorted to ground circuit wires
Shorted to voltage circuit wires
Open circuit wires
Shorted speaker
Open speaker

- 1. Turn IGN OFF.
- 2. Connect **ADVANCED AUDIO SYSTEM BREAKOUT BOX (Part Number: HD-47918)** to wiring harness [149B-1], leaving amplifier [149A-1] disconnected.
- 3. Disconnect left speaker pod [37].
- 4. Using TEST CONNECTOR KIT (Part Number: HD-41404), test voltage between BOB terminals 1 and 2.
- 5. Is resistance less than 2 ohms?
  - a. Yes. Go to Test 2.
  - b. No. Go to Test 5.
- 1. Test resistance between [37A] speaker terminals 1 and 2.
- 2. Is resistance less than 2 ohms?
  - a. Yes. Replace speaker.
  - b. No. Go to Test 3.

- 1. Disconnect rear audio [162].
- 2. Test continuity between BOB terminals 1 and 2.
- 3. Is continuity present?
  - a. Yes. Go to Test 4.
  - b. No. Repair short between [162B] terminals 1 and 2 and [37B] terminals 1 and 2.
- 1. Disconnect fairing [2].
- 2. Test continuity between BOB terminals 1 and 2.
- 3. Is continuity present?
  - a. Yes. Repair short between [2A] terminals 7 and 8 and [149B-1] terminals 1 and 2.
  - b. No. Repair short between [162A] terminals 1 and 2 and [2B] terminals 7 and 8.
- 1. Test continuity between BOB terminals 1 and 2.
- 2. Is continuity present?
  - a. Yes. Go to Test 12.
  - b. No. Go to Test 6.
- 1. Disconnect left speaker [37].
- 2. Test resistance between BOB terminal 1 and [37B] terminal 1 (LBE/O).
- 3. Is resistance less than 0.5 ohm?
  - a. Yes. Go to Test 9.
  - b. No. Go to Test 7.
- 1. Disconnect rear audio [162B].
- 2. Test resistance between BOB terminal 1 and [162A] terminal 1 (LBE/Y).
- 3. Is resistance less than 0.5 ohm?
  - a. Yes. Repair open between [162B] terminal 1 and [37B] terminal 1 (LBE/O).
  - b. No. Go to Test 8.
- 1. Disconnect fairing [2].
- 2. Test resistance between BOB terminal 1 and [2A] terminal 7 (LBE/Y).
- 3. Is resistance less than 0.5 ohm?
  - a. Yes. Repair open between [162A] terminal 1 and [2B] terminal 7 (LBE/Y).
  - b. No. Repair open between [2A] terminal 7 and [149B-1] terminal 1 (LBE/Y).

- 1. Test resistance between BOB terminal 2 and [37B] terminal 2 (LBE/GY).
- 2. Is resistance less than 0.5 ohm?
  - a. Yes. Replace speaker.
  - b. No. Go to Test 10.
- 1. Disconnect rear audio [162B].
- 2. Test resistance between BOB terminal 2 and [162A] terminal 2 (LBE/PK).
- 3. Is resistance less than 0.5 ohm?
  - a. Yes. Repair open between [162B] terminal 2 and [37B] terminal 2 (LBE/GY).
  - b. No. Go to Test 11.
- 1. Disconnect fairing [2].
- 2. Test resistance between BOB terminal 2 and [2A] terminal 8 (LBE/PK).
- 3. Is resistance less than 0.5 ohm?
  - a. Yes. Repair open between [2B] terminal 8 and [162A] terminal 2 (LBE/PK).
  - b. No. Repair open between [2A] terminal 8 and [149B-1] terminal 2 (LBE/PK).
- 1. Test continuity between BOB terminal 1 and ground.
- 2. Is continuity present?
  - a. Yes. Go to Test 13.
  - b. No. Go to Test 15.
- 1. Disconnect rear audio [162B].
- 2. Test continuity between BOB terminal 1 and ground.
- 3. Is continuity present?
  - a. Yes. Go to Test 14.
  - b. **No.** Repair short to ground between [162B] terminal 1 and [37B] terminal 1 (LBE/O).
- 1. Disconnect fairing [2].
- 2. Test continuity between BOB terminal 1 and ground.
- 3. Is continuity present?
  - a. Yes. Repair short to ground between [2A] terminal 7 and [149B-1] terminal 1 (LBE/Y).
  - b. No. Repair short to ground between [2B] terminal 7 and [162A] terminal 1 (LBE/Y).

- 1. Test continuity between BOB terminal 2 and ground.
- 2. Is continuity present?
  - a. Yes. Go to Test 16.
  - b. No. Go to Test 18.
- 1. Disconnect rear audio [162].
- 2. Test continuity between BOB terminal 2 and ground.
- 3. Is continuity present?
  - a. Yes. Go to Test 17.
  - b. No. Repair short to ground between [162B] terminal 2 and [37B] terminal 2 (PK/GY).
- 1. Disconnect fairing [2].
- 2. Test continuity between BOB terminal 2 and ground.
- 3. Is continuity present?
  - a. Yes. Repair short to ground between [2A] terminal 8 and [149B-1] terminal 2 (LBE/PK).
  - b. No. Repair short to ground between [2B] terminal 8 and [162A] terminal 2 (LBE/PK).
- 1. Connect [149A-1].
- 2. Turn IGN ON.
- 3. Test voltage between BOB terminal 1 and ground.
- 4. Is voltage greater than 9.0V?
  - a. Yes. Go to Test 19.
  - b. No. Go to Test 22.
- 1. Turn IGN OFF.
- 2. Disconnect rear audio [162B].
- 3. Turn IGN ON.
- 4. Test voltage between BOB terminal 1 and ground.
- 5. Is voltage greater than 9.0V?
  - a. Yes. Go to Test 20.
  - b. No. Repair short to voltage between [162B] terminal 1 and [37B] terminal 1 (LBE/O).

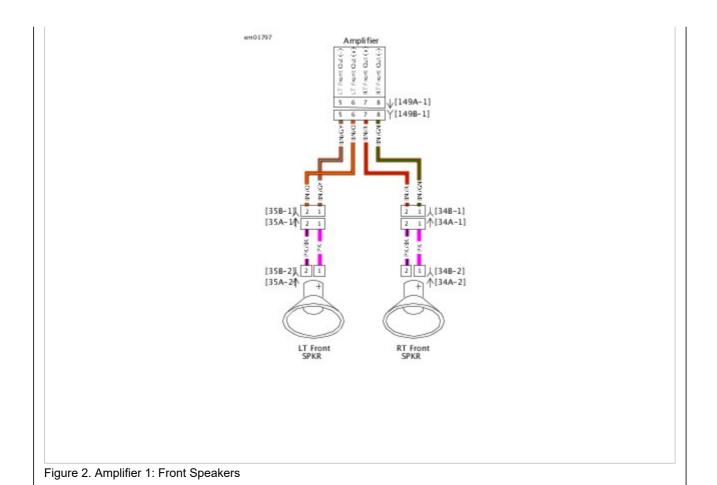
- 1. Turn IGN OFF.
- 2. Disconnect fairing [2].
- 3. Turn IGN ON.
- 4. Test voltage between BOB terminal 1 and ground.
- 5. Is voltage greater than 9.0V?
  - a. Yes. Go to Test 21.
  - b. No. Repair short to voltage between [2B] terminal 7 and [162A] terminal 1 (LBE/Y).
- 1. Turn IGN OFF.
- 2. Disconnect [149B-1].
- 3. Using TERMINAL EXTRACTOR (Part Number: B-50085), remove terminal 1 from [149B-1] (LBE/Y).
- 4. Connect [149B-1].
- 5. Turn IGN ON.
- 6. Test voltage between BOB terminal 1 and ground.
- 7. Is voltage greater than 9.0V?
  - a. Yes. Replace amplifier.
  - b. No. Repair short to voltage between [2A] terminal 7 and [149B-1] terminal 1 (LBE/Y).
- 1. Test voltage between BOB terminal 2 and ground.
- 2. Is voltage greater than 9.0V?
  - a. Yes. Go to Test 23.
  - b. No. Go to Test 26.
- 1. Turn IGN OFF.
- 2. Disconnect rear audio [162B].
- 3. Turn IGN ON.
- 4. Test voltage between BOB terminal 2 and ground.
- 5. Is voltage greater than 9.0V?
  - a. Yes. Go to Test 24.
  - b. No. Repair short to voltage between [162B] terminal 2 and [37B] terminal 2 (PK/GY).
- 1. Turn IGN OFF.
- 2. Disconnect fairing [2].
- 3. Turn IGN ON.
- 4. Test voltage between BOB terminal 2 and ground.
- 5. Is voltage greater than 9.0V?
  - a. Yes. Go to Test 25.
  - b. No. Repair short to voltage between [162A] terminal 2 and [2B] terminal 8 (LBE/PK).

- 1. Turn IGN OFF.
- 2. Disconnect [149B-1].
- 3. Using TERMINAL EXTRACTOR (Part Number: B-50085), remove terminal 2 from [149B-2] (LBE/PK).
- 4. Connect [149B-1].
- 5. Turn IGN ON.
- 6. Test voltage between BOB terminal 2 and ground.
- 7. Is voltage greater than 9.0V?
  - a. Yes. Replace amplifier.
  - b. No. Repair short to voltage between [2A] terminal 8 and [149B-1] terminal 2 (LBE/PK).
- 1. Turn IGN OFF.
- 2. Disconnect [149B-1] from BOB.
- 3. Connect a known good amplifier to [149B-1].
- 4. Turn IGN ON.
- 5. Adjust volume to 3 bars. Is left speaker pod inoperative?
  - a. Yes. Replace radio.
  - b. No. Replace amplifier.

Radio

| Compared to the compa

Figure 1. Radio and Amplifier 1 Circuit



Description	Part Number	Qty.
TERMINAL EXTRACTOR	B-50085	1
TEST CONNECTOR KIT	HD-41404	1
ADVANCED AUDIO SYSTEM BREAKOUT BOX	HD-47918	1
BREAKOUT BOX	HD-50390-1	1
BCM CABLE	HD-50390-2	1
BCM OVERLAY	HD-50390-2-P	1

T 11 4	D: 1 / E /		o .		D: (: E 1)
Table 1.	Right Front	Fairing	Speaker	inoperative	Diagnostic Faults

Shorted together circuit wires
Shorted to ground circuit wires
Shorted to voltage circuit wires
Open circuit wires
Shorted speaker
Open speaker

- 1. Turn IGN OFF.
- 2. Connect BREAKOUT BOX (Part Number:HD-50390-1) and BCM CABLE (Part Number:HD-50390-2) to wiring harness [27B], leaving radio [27A] disconnected.
- 3. Verify BCM OVERLAY (Part Number: HD-50390-2-P) is in position on BOB.
- 4. Using TEST CONNECTOR KIT (Part Number: HD-41404), test continuity between BOB terminals M1 and M2.
- 5. Is continuity present?
  - a. Yes. Go to Test 6.
  - b. No. Go to Test 2.
- 1. Connect **ADVANCED AUDIO SYSTEM BREAKOUT BOX (Part Number: HD-47918)** to wiring harness [149B-1], leaving amplifier [149A-1] disconnected.
- 2. Test resistance between radio BOB terminal M1 and amplifier BOB terminal 22.

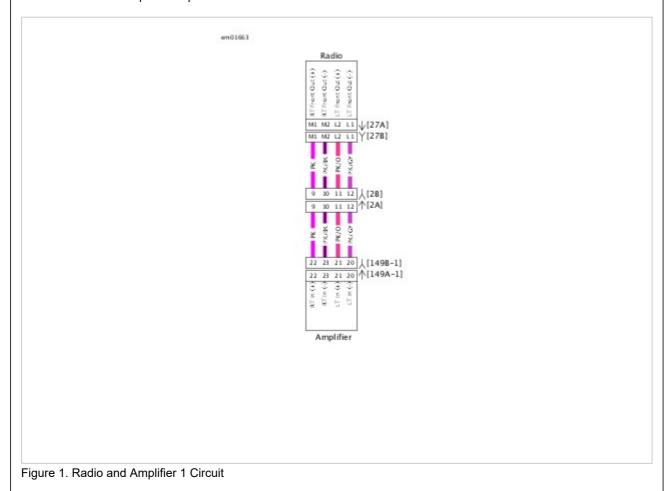
- 3. Is resistance less than 0.5 Ohm?
  - a. Yes. Go to Test 4.
  - b. No. Go to Test 3.
- 1. Disconnect fairing [2].
- 2. Test resistance between radio BOB terminal M1 and [2B] terminal 9 (PK).
- 3. Is resistance less than 0.5 Ohm?
  - a. Yes. Repair open between [149B-1] terminal 22 and [2A] terminal 9 (PK).
  - b. No. Repair open between [2B] terminal 9 and [27B] terminal M1 (PK).
- 1. Test resistance between radio BOB terminal M2 and amplifier BOB terminal 23.
- 2. Is resistance less than 0.5 Ohm?
  - a. Yes. Replace amplifier.
  - b. No. Go to Test 5.
- 1. Disconnect fairing [2].
- 2. Test resistance between radio BOB terminal M2 and [2B] terminal 10 (PK/BK).
- 3. Is resistance less than 0.5 Ohm?
  - a. Yes. Repair open between [149B-1] terminal 23 and [2A] terminal 10 (PK/BK).
  - b. No. Repair open between [2B] terminal 10 and [27B] terminal M2 (PK/BK).
- 1. Turn IGN OFF.
- 2. Remove radio BOB and connect [27].
- 3. Connect ADVANCED AUDIO SYSTEM BREAKOUT BOX (Part Number: HD-47918) to wiring harness [149B-1], leaving amplifier [149A-1] disconnected.
- 4. Test resistance between BOB terminals 7 and 8.
- 5. Is resistance less than 2 Ohms?
  - a. Yes. Go to Test 7.
  - b. No. Go to Test 9.
- 1. Disconnect speaker harness [34-1].
- 2. Test continuity between BOB terminals 7 and 8.
- 3. Is continuity present?
  - a. Yes. Repair short between [34B-1] terminals 1 and 2 and [149B-1] terminals 7 and 8.
  - b. No. Go to Test 8.

- 1. Disconnect speaker [34-2].
- 2. Test resistance between [34A-2] terminals 1 and 2.
- 3. Is resistance less than 2 Ohms?
  - a. Yes. Replace speaker.
  - b. No. Repair short between [34A-1] terminals 1 and 2 and [34B-2] terminals 1 and 2.
- 1. Test continuity between BOB terminals 7 and 8.
- 2. Is continuity present?
  - a. Yes. Go to Test 14.
  - b. No. Go to Test 10.
- 1. Disconnect speaker harness [34-1].
- 2. Test resistance between BOB terminal 7 and [34B-1] terminal 2 (BN/R).
- 3. Is resistance less than 0.5 Ohm?
  - a. Yes. Go to Test 11.
  - b. No. Repair open between [34B-1] terminal 2 and [149B-1] terminal 7 (BN/R).
- 1. Test resistance between BOB terminal 8 and [34B-1] terminal 1 (BN/GN).
- 2. Is resistance less than 0.5 Ohm?
  - a. Yes. Go to Test 12.
  - b. No. Repair open between [34B-1] terminal 1 and [149B-1] terminal 8 (BN/GN).
- 1. Disconnect speaker [34-2].
- 2. Test resistance between [34A-1] terminal 1 and [34B-2] terminal 1 (PK).
- 3. Is resistance less than 0.5 Ohm?
  - a. Yes. Go to Test 13.
  - b. No. Repair open between [34B-2] terminal 1 and [34A-1] terminal 1 (PK).
- 1. Test resistance between [34A-1] terminal 2 and [34B-2] terminal 2 (PK/BK).
- 2. Is resistance less than 0.5 Ohm?
  - a. Yes. Replace speaker.
  - b. No. Repair open between [34B-2] terminal 2 and [34A-1] terminal 2 (PK/BK).

- 1. Test continuity between BOB terminal 7 and ground.
- 2. Is continuity present?
  - a. Yes. Go to Test 15.
  - b. No. Go to Test 16.
- 1. Disconnect speaker harness [34-1].
- 2. Test continuity between BOB terminal 7 and ground.
- 3. Is continuity present?
  - a. Yes. Repair short to ground between [34B-1] terminal 2 and [149B-1] terminal 7 (BN/R).
  - b. No. Repair short to ground between [34A-1] terminal 2 and [34B-2] terminal 2 (PK/BK).
- 1. Test continuity between BOB terminal 8 and ground.
- 2. Is continuity present?
  - a. Yes. Go to Test 17.
  - b. No. Go to Test 18.
- 1. Disconnect speaker harness [34-1].
- 2. Test continuity between BOB terminal 8 and ground.
- 3. Is continuity present?
  - a. Yes. Repair short to ground between [34B-1] terminal 1 and [149B-1] terminal 8 (BN/GN).
  - b. No. Repair short to ground between [34A-1] terminal 1 and [34B-2] terminal 1 (PK).
- 1. Connect [149A-1].
- 2. Turn IGN ON.
- 3. Test voltage between BOB terminal 7 and ground.
- 4. Is voltage greater than 9.0V?
  - a. Yes. Go to Test 19.
  - b. No. Go to Test 21.
- 1. Disconnect speaker harness [34B-1].
- 2. Test voltage between BOB terminal 7 and ground.
- 3. Is voltage greater than 9.0V?

- a. Yes. Go to Test 20.
- b. **No.** Repair short to voltage between [34A-1] terminal 2 and [34B-2] terminal 2 (PK/BK).
- 1. Turn IGN OFF.
- 2. Disconnect [149B-1].
- 3. Using TERMINAL EXTRACTOR (Part Number: B-50085), remove terminal 7 from [149B-1] (BN/R).
- 4. Connect [149B-1].
- 5. Turn IGN ON.
- 6. Test voltage between BOB terminal 7 and ground.
- 7. Is voltage greater than 9.0V?
  - a. Yes. Replace amplifier.
  - b. **No.** Repair short to voltage between [34B-1] terminal 2 and [149B-1] terminal 7 (BN/R).
- 1. Test voltage between BOB terminal 8 and ground.
- 2. Is voltage greater than 9.0V?
  - a. Yes. Go to Test 22.
  - b. No. Go to Test 24.
- 1. Disconnect speaker harness [34-1].
- 2. Test voltage between BOB terminal 8 and ground.
- 3. Is voltage greater than 9.0V?
  - a. Yes. Go to Test 23.
  - b. No. Repair short to voltage between [34A-1] terminal 1 and [34B-2] terminal 1 (PK).
- 1. Turn IGN OFF.
- 2. Disconnect [149B-1].
- 3. Using TERMINAL EXTRACTOR (Part Number: B-50085), remove terminal 8 from [149B-1] (BN/GN).
- 4. Connect [149B-1].
- 5. Turn IGN ON.
- 6. Test voltage between BOB terminal 8 and ground.
- 7. Is voltage greater than 9.0V?
  - a. Yes. Replace amplifier.
  - b. No. Repair short to voltage between [34B-1] terminal 1 and [149B-1] terminal 8 (BN/GN).
- 1. Turn IGN OFF.
- 2. Disconnect [149B-1] from BOB.

- 3. Connect a known good amplifier to [149B-1].
- 4. Turn IGN ON.
- 5. Adjust volume to 3 bars. Is front right speaker inoperative?
  - a. Yes. Replace radio.
  - b. No. Replace amplifier.



Description	Part Number	Qty.
TEST CONNECTOR KIT	HD-41404	1
ADVANCED AUDIO SYSTEM BREAKOUT BOX	HD-47918	1
BREAKOUT BOX	HD-50390-1	1
BCM CABLE	HD-50390-2	1
BCM OVERLAY	HD-50390-2-P	1

Table 1. Both Right Speakers Inoperative Diagnostic Faults

Circuit wires shorted together
Circuit wires shorted to ground
Circuit wires shorted to voltage
Open circuit wires

- 1. Turn IGN OFF.
- 2. Connect BREAKOUT BOX (Part Number:HD-50390-1) and BCM CABLE (Part Number:HD-50390-2) to wiring harness [27B], leaving radio [27A] disconnected.
- 3. Verify BCM OVERLAY (Part Number: HD-50390-2-P) is in position on BOB.
- 4. Using TEST CONNECTOR KIT (Part Number:HD-41404), test continuity between BOB terminals M1 and M2.
- 5. Is continuity present?
  - a. Yes. Go to Test 6.
  - b. No. Go to Test 2.
- 1. Connect **ADVANCED AUDIO SYSTEM BREAKOUT BOX (Part Number: HD-47918)** to wiring harness [149B-1], leaving amplifier [149A-1] disconnected.
- 2. Test resistance between radio BOB terminal M1 and amplifier BOB terminal 22.
- 3. Is resistance less than 0.5 Ohm?
  - a. Yes. Go to Test 4.
  - b. No. Go to Test 3.

- 1. Disconnect fairing [2].
- 2. Test resistance between radio BOB terminal M1 and [2B] terminal 9 (PK).
- 3. Is resistance less than 0.5 Ohm?
  - a. Yes. Repair open between [149B-1] terminal 22 and [2A] terminal 9 (PK).
  - b. No. Repair open between [2B] terminal 9 and [27B] terminal M1 (PK).
- 1. Test resistance between radio BOB terminal M2 and amplifier BOB terminal 23.
- 2. Is resistance less than 0.5 Ohm?
  - a. Yes. Replace amplifier.
  - b. No. Go to Test 5.
- 1. Disconnect fairing [2].
- 2. Test resistance between radio BOB terminal M2 and [2B] terminal 10 (PK/BK).
- 3. Is resistance less than 0.5 Ohm?
  - a. Yes. Repair open between [149B-1] terminal 23 and [2A] terminal 10 (PK/BK).
  - b. No. Repair open between [2B] terminal 10 and [27B] terminal M2 (PK/BK).
- 1. Turn IGN OFF.
- 2. Disconnect [149B-1] from BOB.
- 3. Connect a known good amplifier to [149B-1].
- 4. Turn IGN ON.
- 5. Adjust volume to 3 bars. Are both right speakers inoperative?
  - a. Yes. Replace radio.
  - b. No. Replace amplifier.

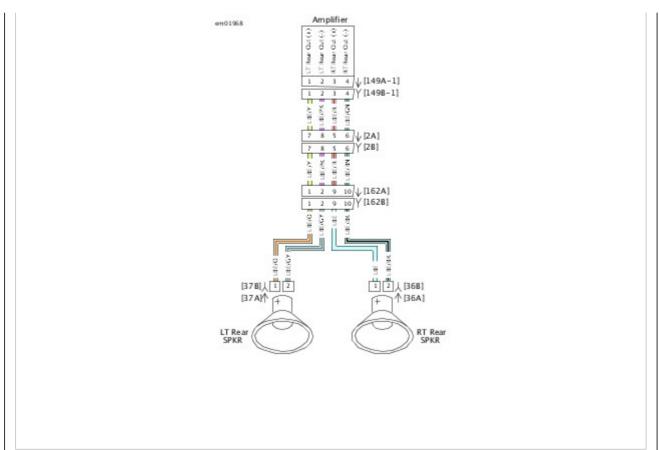


Figure 1. Amplifier 1: Rear Speaker Pods

Description	Part Number	Qty.
TERMINAL EXTRACTOR	B-50085	1
TEST CONNECTOR KIT	HD-41404	1
ADVANCED AUDIO SYSTEM BREAKOUT BOX	HD-47918	1

# Table 1. Right Speaker Pod Inoperative Diagnostic Faults

Shorted together circuit wires
Shorted to ground circuit wires
Shorted to voltage circuit wires
Open circuit wires
Shorted speaker
Open speaker

- 1. Turn IGN OFF.
- 2. Connect **ADVANCED AUDIO SYSTEM BREAKOUT BOX (Part Number: HD-47918)** to wiring harness [149B-1], leaving amplifier [149A-1] disconnected.
- 3. Disconnect right speaker pod [36].
- 4. Using TEST CONNECTOR KIT (Part Number:HD-41404), test voltage between BOB terminals 3 and 4.
- 5. Is resistance less than 2 ohms?
  - a. Yes. Go to Test 2.
  - b. No. Go to Test 5.
- 1. Test resistance between [36A] speaker terminals 1 and 2.
- 2. Is resistance less than 2 ohms?
  - a. Yes. Replace speaker.
  - b. No. Go to Test 3.

- 1. Disconnect rear audio [162].
- 2. Test continuity between BOB terminals 3 and 4.
- 3. Is continuity present?
  - a. Yes. Go to Test 4.
  - b. No. Repair short between [162B] terminals 9 and 10 and [36B] terminals 1 and 2.
- 1. Disconnect fairing [2].
- 2. Test continuity between BOB terminals 3 and 4.
- 3. Is continuity present?
  - a. Yes. Repair short between [2A] terminals 5 and 6 and [149B-1] terminals 3 and 4.
  - b. No. Repair short between [2B] terminals 5 and 6 and [162A] terminals 9 and 10.
- 1. Test continuity between BOB terminals 3 and 4.
- 2. Is continuity present?
  - a. Yes. Go to Test 12.
  - b. No. Go to Test 6.
- 1. Test resistance between BOB terminal 3 and [36B] terminal 1 (LBE).
- 2. Is resistance less than 0.5 ohm?
  - a. Yes. Go to Test 9.
  - b. No. Go to Test 7.
- 1. Disconnect rear audio [162B].
- 2. Test resistance between BOB terminal 3 and [162A] terminal 9 (LBE).
- 3. Is resistance less than 0.5 ohm?
  - a. Yes. Repair open between [162B] terminal 9 and [37B] terminal 1 (LBE).
  - b. No. Go to Test 8.
- 1. Disconnect fairing [2].
- 2. Test resistance between BOB terminal 3 and [2A] terminal 5 (LBE/R).
- 3. Is resistance less than 0.5 ohm?
  - a. Yes. Repair open between [2B] terminal 5 and [162A] terminal 9 (LBE/R).
  - b. No. Repair open between [2A] terminal 5 and [149B-1] terminal 3 (LBE/R).

- 1. Test resistance between BOB terminal 4 and [36B] terminal 2 (LBE/BK).
- 2. Is resistance less than 0.5 ohm?
  - a. Yes. Replace speaker.
  - b. No. Go to Test 10.
- 1. Disconnect rear audio [162].
- 2. Test resistance between BOB terminal 4 and [162A] terminal 10 (LBE/GN).
- 3. Is resistance less than 0.5 ohm?
  - a. Yes. Repair open between [162B] terminal 10 and [36B] terminal 2 (LBE/BK).
  - b. No. Go to Test 11.
- 1. Disconnect fairing [2].
- 2. Test resistance between BOB terminal 4 and [2A] terminal 6 (LBE/GN).
- 3. Is resistance less than 0.5 ohm?
  - a. Yes. Repair open between [2B] terminal 6 and [162A] terminal 10 (LBE/GN).
  - b. No. Repair open between [2A] terminal 6 and [149B-1] terminal 4 (LBE/GN).
- 1. Test continuity between BOB terminal 3 and ground.
- 2. Is continuity present?
  - a. Yes. Go to Test 13.
  - b. No. Go to Test 15.
- 1. Disconnect rear audio [162B].
- 2. Test continuity between BOB terminal 3 and ground.
- 3. Is continuity present?
  - a. Yes. Go to Test 14.
  - b. No. Repair short to ground between [162B] terminal 9 and [36B] terminal 1 (LBE).
- 1. Disconnect fairing [2].
- 2. Test continuity between BOB terminal 3 and ground.
- 3. Is continuity present?
  - a. Yes. Repair short to ground between [2A] terminal 5 and [149B-1] terminal 3 (LBE/R).
  - b. No. Repair short to ground between [2B] terminal 5 and [162A] terminal 9 (LBE/R).

- 1. Test continuity between BOB terminal 4 and ground.
- 2. Is continuity present?
  - a. Yes. Go to Test 16.
  - b. No. Go to Test 18.
- 1. Disconnect rear audio [162].
- 2. Test continuity between BOB terminal 4 and ground.
- 3. Is continuity present?
  - a. Yes. Go to Test 17.
  - b. No. Repair short to ground between [162B] terminal 10 and [36B] terminal 2 (LBE/BK).
- 1. Disconnect fairing [2].
- 2. Test continuity between BOB terminal 4 and ground.
- 3. Is continuity present?
  - a. Yes. Repair short to ground between [2A] terminal 6 and [149B-1] terminal 4 (LBE/GN).
  - b. No. Repair short to ground between [2B] terminal 6 and [162A] terminal 10 (LBE/GN).
- 1. Connect [149A-1].
- 2. Turn IGN ON.
- 3. Test voltage between BOB terminal 3 and ground.
- 4. Is voltage greater than 9.0V?
  - a. Yes. Go to Test 19.
  - b. No. Go to Test 22.
- 1. Turn IGN OFF.
- 2. Disconnect rear audio [162].
- 3. Turn IGN ON.
- 4. Test voltage between BOB terminal 3 and ground.
- 5. Is voltage greater than 9.0V?
  - a. Yes. Go to Test 20.
  - b. No. Repair short to voltage between [162B] terminal 9 and [36B] terminal 1 (LBE).
- 1. Turn IGN OFF.

- 2. Disconnect fairing [2].
- 3. Turn IGN ON.
- 4. Test voltage between BOB terminal 3 and ground.
- 5. Is voltage greater than 9.0V?
  - a. Yes. Go to Test 21.
  - b. No. Repair short to voltage between [2B] terminal 5 and [162A] terminal 9 (LBE/R).
- 1. Turn IGN OFF.
- 2. Disconnect [149B-1].
- 3. Using TERMINAL EXTRACTOR (Part Number: B-50085), remove terminal 3 from [149B-1] (LBE/R).
- 4. Connect [149-1].
- 5. Turn IGN ON.
- 6. Test voltage between BOB terminal 3 and ground.
- 7. Is voltage greater than 9.0V?
  - a. Yes. Replace amplifier.
  - b. No. Repair short to voltage between [2A] terminal 5 and [149B-1] terminal 3 (LBE/R).
- 1. Test voltage between BOB terminal 4 and ground.
- 2. Is voltage greater than 9.0V?
  - a. Yes. Go to Test 23.
  - b. No. Go to Test 26.
- 1. Turn IGN OFF.
- 2. Disconnect rear audio [162].
- 3. Turn IGN ON.
- 4. Test voltage between BOB terminal 4 and ground.
- 5. Is voltage greater than 9.0V?
  - a. Yes. Go to Test 24.
  - b. No. Repair short to voltage between [162B] terminal 10 and [36B] terminal 2 (LBE/BK).
- 1. Turn IGN OFF.
- 2. Disconnect fairing [2].
- 3. Turn IGN ON.
- 4. Test voltage between BOB terminal 4 and ground.
- 5. Is voltage greater than 9.0V?
  - a. Yes. Go to Test 25.
  - b. **No.** Repair short to voltage between [2B] terminal 6 and [162A] terminal 10 (LBE/GN).

- 1. Turn IGN OFF.
- 2. Disconnect [149B-1].
- 3. Using TERMINAL EXTRACTOR (Part Number: B-50085), remove terminal 4 from [149B-1] (LBE/GN).
- 4. Connect [149-1].
- 5. Turn IGN ON.
- 6. Test voltage between BOB terminal 4 and ground.
- 7. Is voltage greater than 9.0V?
  - a. Yes. Replace amplifier.
  - b. No. Repair short to voltage between [2A] terminal 6 and [149B-1] terminal 4 (LBE/GN).
- 1. Turn IGN OFF.
- 2. Disconnect [149B-1] from BOB.
- 3. Connect a known good amplifier to [149B-1].
- 4. Turn IGN ON.
- 5. Adjust volume to 3 bars. Is right rear speaker pod inoperative?
  - a. Yes. Replace radio.
  - b. No. Replace amplifier.

Description	Part Number	Qty.
DIGITAL TECHNICIAN II	HD-48650	1

The wireless headset consists of the Wireless Headset Interface Module (WHIM), helmet headset and radio information screen. The headset is a Bluetooth device that communicates thru the WHIM to the vehicles BOOM audio system.

Many faults may occur that do not set a DTC. Verify no DTCs are present before diagnosing symptoms.

Table 1. Code Description

B1367	WHIM fault detected
U0185	Lost comm w/AMP 1
U1302	Acc Bus Perf Error
U1405	Accessory bus lost communication with PNA 1

Table 2. Symptoms Description

Loss of wireless headsets
Software update fails
Front or rear microphone inoperative
Front headset right speaker inoperative
Front headset left speaker inoperative
Rear headset right speaker inoperative
Rear headset left speaker inoperative
Intermittent volume level front or rear headsets

- Use DIGITAL TECHNICIAN II (Part Number: HD-48650) to retrieve wireless headset DTCs.
- Refer to owners manual for wireless headset set-up.
- Verify headsets are fully charged.
- Check for radio software updates.
- Always perform factory default reset to wireless headsets before performing diagnostics.

For additional information about the connectors in the following diagram(s) and diagnostic procedure(s), including the color of the harness test kit terminal probes, see **General**.

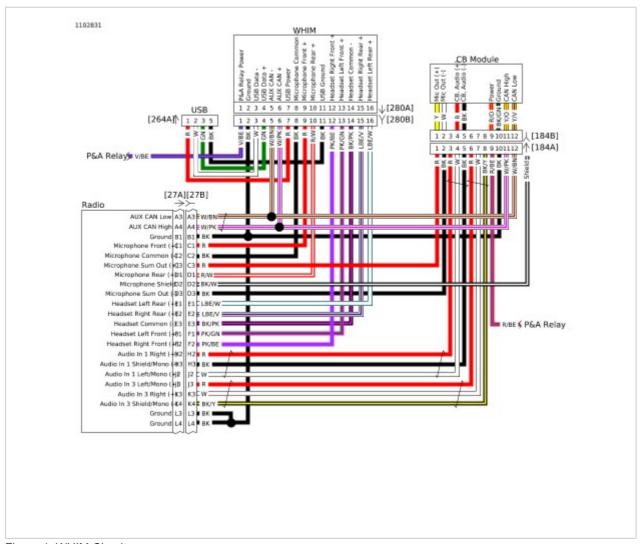


Figure 1. WHIM Circuit

# Table 1. DTC U0185, U1405 Diagnostic Faults

1. Turn IGN OFF.

P&A replay power shorted low

- 2. Disconnect [280A].
- 3. Replace P&A fuse.
- 4. Turn IGN ON.
- 5. Does the fuse open again?
  - a. Yes. Repair short to ground in that circuit
  - b. No. Go to Test 2.
- 1. Turn IGN OFF.
- 2. Connect [280A] to WHIM.
- 3. Verify P&A fuse is not open.
- 4. Turn IGN ON.
- 5. Does the P&A fuse open?
  - a. Yes. Replace WHIM.
  - b.  $\mbox{\bf No.}$  Verify no DTCs are present.

Description	Part Number	Qty.
TEST CONNECTOR KIT	HD-41404	1
BREAKOUT BOX	HD-50390-1	1
BCM OVERLAY	HD-50390-2-P	1

Table 1. DTC B1367, U1302 Diagnostic Fa	ults
Open or shorted CAN low or high circuit	

- 1. Turn IGN OFF.
- 2. Disconnect WHIM [280].
- 3. Connect BREAKOUT BOX (Part Number: HD-50390-1), leaving radio disconnected.
- 4. Verify BCM OVERLAY (Part Number: HD-50390-2-P) is in position on BOB.
- 5. Using **TEST CONNECTOR KIT (Part Number:HD-41404)**, test resistance between [280B] terminal 5 and breakout box terminal A3.
- 6. Is resistance less than 0.5 ohm?
  - a. Yes. Go to Test 2.
  - b. No. Repair open in W/BN wire.
- 1. Using **TEST CONNECTOR KIT (Part Number: HD-41404)**, test resistance between [280B] terminal 6 and breakout box terminal A4.
- 2. Is resistance less than 0.5 ohm?
  - a. Yes. Go to Test 3.
  - b. No. Repair open in W/PK wire.
- 1. Disconnect CB module [184].
- Using TEST CONNECTOR KIT (Part Number: HD-41404), test resistance between [280B] terminal 5 and ground.
- 3. Is continuity present?
  - a. Yes. Repair short to ground (W/BN) wire.
  - b. No. Go to Test 4.

- 1. Using **TEST CONNECTOR KIT (Part Number:HD-41404)**, test resistance between [280B] terminal 6 and ground.
- 2. Is continuity present?
  - a. Yes. Repair short to ground W/PK wire.
  - b. No. Go to Test 5.
- 1. Test voltage between radio BOB terminal A3 and ground.
- 2. Test voltage between radio BOB terminal A4 and ground.
- 3. Turn IGN ON.
- 4. Is voltage present on either circuit?
  - a. Yes. Without CB. Repair short to voltage in (W/BN) or (W/PK) wires.
  - b. Yes. With CB. Go to Test 7.
  - c. No. Go to Test 6.
- 1. Remove radio BOB and connect radio to main harness.
- 2. Connect [280] to WHIM.
- 3. Clear DTCs.
- 4. Turn IGN ON.
- 5. Check DTCs.
- 6. Did DTC reset?
  - a. Yes. Replace WHIM.
  - b. No. System operating properly.
- 1. Remove radio BOB and connect radio to main harness.
- 2. Connect [184] to CB.
- 3. Clear DTCs.
- 4. Turn IGN ON.
- 5. Check DTCs.
- 6. Did DTC reset?
  - a. Yes. Replace CB.
  - b. No. System operating properly.

Description	Part Number	Qty.
TEST CONNECTOR KIT	HD-41404	1

# Table 1. Loss of Wireless Headsets Diagnostic Faults

WHIM power or ground circuit open

Wireless headset interface module malfunction

- 1. Turn IGN OFF.
- 2. Disconnect WHIM [280A].
- 3. Using **TEST CONNECTOR KIT (Part Number:HD-41404)**, test for voltage between [280A] terminal 1 and ground.
- 4. Turn IGN ON.
- 5. Is battery voltage present?
  - a. Yes. Go to Test 2.
  - b. No. Repair open in V/BE wire.
- 1. Turn IGN OFF.
- 2. Disconnect WHIM [280A].
- 3. Using **TEST CONNECTOR KIT (Part Number:HD-41404)**, test continuity between [280A] terminal 2 and ground.
- 4. Is continuity present?
  - a. Yes. Replace WHIM.
  - b. No. Repair open in BK wire.

Description	Part Number	Qty.
TEST CONNECTOR KIT	HD-41404	1

#### Table 1. Software Update Fails Diagnostic Faults

USB inline circuit shorted low or open

Wireless headset interface module malfunction

- 1. Turn IGN OFF.
- 2. Disconnect WHIM [280] and USB inline [264].
- 3. Using **TEST CONNECTOR KIT (Part Number:HD-41404)**, test resistance between [280B] terminal 7 and [264A] terminal 1.
- 4. Is resistance less than 0.5 ohm?
  - a. Yes. Go to Test 2.
  - b. No. Repair open in (R) wire.
- Using TEST CONNECTOR KIT (Part Number: HD-41404), test continuity between [280B] terminal 7 and ground.
- 2. Is continuity present?
  - a. Yes. Repair short to ground (R) wire.
  - b. No. Go to Test 3.
- 1. Using **TEST CONNECTOR KIT (Part Number:HD-41404)**, test resistance between [280B] terminal 3 and [264A] terminal 2.
- 2. Is resistance less than 0.5 ohm?
  - a. Yes. Go to Test 4.
  - b. No. Repair open in (W) wire.
- 1. Using **TEST CONNECTOR KIT (Part Number:HD-41404)**, test continuity between [280B] terminal 3 and ground.
- 2. Is continuity present?

- a. Yes. Repair short to ground in (W) wire.
- b. No. Go to Test 5.
- 1. Using **TEST CONNECTOR KIT (Part Number:HD-41404)**, test resistance between [280B] terminal 4 and [264A] terminal 3.
- 2. Is resistance less than 0.5 ohm?
  - a. Yes. Go to Test 6.
  - b. No. Repair open in (GN) wire.
- 1. Using **TEST CONNECTOR KIT (Part Number:HD-41404)**, test continuity between [280B] terminal 4 and ground.
- 2. Is continuity present?
  - a. Yes. Repair short to ground in (GN) wire.
  - b. No. Go to Test 7.
- 1. Using **TEST CONNECTOR KIT (Part Number:HD-41404)**, test resistance between [280B] terminal 11 and [264A] terminal 4.
- 2. Is resistance less than 0.5 ohm?
  - a. Yes. Go to Test 8.
  - b. No. Repair open in (BK) wire.
- 1. Using **TEST CONNECTOR KIT (Part Number:HD-41404)**, test continuity between [280B] terminal 11and ground.
- 2. Is continuity present?
  - a. Yes. Repair short to ground in (BK) wire.
  - b. No. Replace USB cable extension.

Description	Part Number	Qty.
TEST CONNECTOR KIT	HD-41404	1
BREAKOUT BOX	HD-50390-1	1
BCM OVERLAY	HD-50390-2-P	1

Table 1. Front Microphone Inoperative Diagnostic Fault	Table 1.	Front Micro	phone Ino	perative D	iagnostic l	Faults
--	----------	-------------	-----------	------------	-------------	--------

Front headset malfunction
Front microphone circuit shorted low or open
Wireless headset interface module malfunction

- 1. Pair a known good set to the front position.
- 2. Does headset work properly?
  - a. Yes. Replace headset.
  - b. No. Go to Test 2.
- 1. Turn IGN OFF.
- 2. Disconnect WHIM [280] and radio [27].
- 3. Connect BREAKOUT BOX (Part Number: HD-50390-1), leaving radio disconnected.
- 4. Verify BCM OVERLAY (Part Number: HD-50390-2-P) is in position on BOB.
- 5. Using **TEST CONNECTOR KIT (Part Number:HD-41404)**, test resistance between [280B] terminal 9 and [27B] terminal C1.
- 6. Is resistance less than 0.5 ohm?
  - a. Yes. Go to Test 3.
  - b. No. Repair open in (R) wire.
- 1. Using **TEST CONNECTOR KIT (Part Number:HD-41404)**, test continuity between [280A] terminal 9 and ground.
- 2. Is continuity present?
  - a. Yes. Repair short to ground in (R) wire.
  - b. No. Replace WHIM.

Description	Part Number	Qty.
TEST CONNECTOR KIT	HD-41404	1
BREAKOUT BOX	HD-50390-1	1
BCM OVERLAY	HD-50390-2-P	1

	Table 1. Rea	ar Microphone	Inoperative	Diagnostic	Faults
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Rear headset malfunction
Rear microphone circuit shorted low or open
Wireless headset interface module malfunction

- 1. Pair a known good set to the rear position.
- 2. Does headset work properly?
  - a. Yes. Replace headset.
  - b. No. Go to Test 2.
- 1. Turn IGN OFF.
- 2. Disconnect WHIM [280] and radio [27].
- 3. Connect BREAKOUT BOX (Part Number: HD-50390-1), leaving radio disconnected.
- 4. Verify BCM OVERLAY (Part Number: HD-50390-2-P) is in position on BOB.
- 5. Using **TEST CONNECTOR KIT (Part Number:HD-41404)**, test resistance between [280B] terminal 10 and breakout box terminal D1.
- 6. Is resistance less than 0.5 ohm?
  - a. Yes. Go to Test 3.
  - b. No. Repair open in (R/W) wire.
- 1. Using **TEST CONNECTOR KIT (Part Number:HD-41404)**, test continuity between [280B] terminal 10 and ground.
- 2. Is continuity present?
  - a. Yes. Repair short to ground in (R/W) wire.
  - b. No. Replace WHIM.

Description	Part Number	Qty.
TEST CONNECTOR KIT	HD-41404	1
BREAKOUT BOX	HD-50390-1	1
BCM OVERLAY	HD-50390-2-P	1

Table 1. Front Headset Right speaker Inoperat
---

Front headset malfunction
Front headset circuit shorted low or open
Wireless headset interface module malfunction

- 1. Pair a known good set to the front position.
- 2. Does headset work properly?
  - a. Yes. Replace headset.
  - b. No. Go to Test 2.
- 1. Turn IGN OFF.
- 2. Disconnect WHIM [280] and radio [27].
- 3. Connect BREAKOUT BOX (Part Number: HD-50390-1), leaving radio disconnected.
- 4. Verify BCM OVERLAY (Part Number: HD-50390-2-P) is in position on BOB.
- 5. Using **TEST CONNECTOR KIT (Part Number:HD-41404)**, test resistance between [280B] terminal 12 and breakout box terminal F2.
- 6. Is resistance less than 0.5 ohm?
  - a. Yes. Go to Test 3.
  - b. No. Repair open in (PK/BE) wire.
- Using TEST CONNECTOR KIT (Part Number: HD-41404), test continuity between [280B] terminal 12 and ground.
- 2. Is continuity present?
  - a. Yes. Repair short to ground in (PK/BE) wire.
  - b. No. Replace WHIM.

Description	Part Number	Qty.
TEST CONNECTOR KIT	HD-41404	1
BREAKOUT BOX	HD-50390-1	1
BCM OVERLAY	HD-50390-2-P	1

Table 1. Front Headset Left Speaker Inoperative Diagnostic F
--

Front headset malfunction
Front headset circuit shorted low or open
Wireless headset interface module malfunction

- 1. Pair a known good set to the front position.
- 2. Does headset work properly?
  - a. Yes. Replace headset.
  - b. No. Go to Test 2.
- 1. Turn IGN OFF.
- 2. Disconnect WHIM [280] and radio [27].
- 3. Connect BREAKOUT BOX (Part Number: HD-50390-1), leaving radio disconnected.
- 4. Verify BCM OVERLAY (Part Number: HD-50390-2-P) is in position on BOB.
- 5. Using **TEST CONNECTOR KIT (Part Number: HD-41404)**, test resistance between [280B] terminal 13 and breakout box terminal F1.
- 6. Is resistance less than 0.5 ohm?
  - a. Yes. Go to Test 3.
  - b. No. Repair open in (PK/GN) wire.
- 1. Using **TEST CONNECTOR KIT (Part Number:HD-41404)**, test continuity between [280B] terminal 13 and ground.
- 2. Is continuity present?
  - a. Yes. Repair short to ground in (PK/GN) wire.
  - b. No. Replace WHIM.

Description	Part Number	Qty.
TEST CONNECTOR KIT	HD-41404	1
BREAKOUT BOX	HD-50390-1	1
BCM OVERLAY	HD-50390-2-P	1

Table 1. Rear Headset Right Speaker Inoperative Diagnostic Fau	Table 1	. Rear	Headset	Riaht	Speaker	Inoperative	Diagn	ostic I	Fau
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Rear headset malfunction
Rear headset circuit shorted low or open
Wireless headset interface module malfunction

- 1. Pair a known good set to the rear position.
- 2. Does headset work properly?
  - a. Yes. Replace headset.
  - b. No. Go to Test 2.
- 1. Turn IGN OFF.
- 2. Disconnect WHIM [280] and radio [27].
- 3. Connect BREAKOUT BOX (Part Number: HD-50390-1), leaving radio disconnected.
- 4. Verify BCM OVERLAY (Part Number: HD-50390-2-P) is in position on BOB.
- 5. Using **TEST CONNECTOR KIT (Part Number:HD-41404)**, test resistance between [280B] terminal 15 and breakout box terminal E2.
- 6. Is resistance less than 0.5 ohm?
  - a. Yes. Go to Test 3.
  - b. No. Repair open in (LBE/V) wire.
- 1. Using **TEST CONNECTOR KIT (Part Number:HD-41404)**, test continuity between [280B] terminal 15 and ground.
- 2. Is continuity present?
  - a. Yes. Repair short to ground in (LBE/V) wire.
  - b. No. Replace WHIM.

Description	Part Number	Qty.
TEST CONNECTOR KIT	HD-41404	1
BREAKOUT BOX	HD-50390-1	1
BCM OVERLAY	HD-50390-2-P	1

Table 1.	Rear	Headset	Left S	peaker	Inoperative	Diagnos	tic Fault	ts
Table 1.	ı (Cai	licaasci		poundi	moporativo	Diagnos	ilo i auii	w

Rear headset malfunction
Rear headset circuit shorted low or open
Wireless headset interface module malfunction

- 1. Pair a known good set to the rear position.
- 2. Does headset work properly?
  - a. Yes. Replace headset.
  - b. No. Go to Test 2.
- 1. Turn IGN OFF.
- 2. Disconnect WHIM [280] and radio [27].
- 3. Connect BREAKOUT BOX (Part Number: HD-50390-1), leaving radio disconnected.
- 4. Verify BCM OVERLAY (Part Number: HD-50390-2-P) is in position on BOB.
- 5. Using **TEST CONNECTOR KIT (Part Number: HD-41404)**, test resistance between [280B] terminal 16 and breakout box terminal E1.
- 6. Is resistance less than 0.5 ohm?
  - a. Yes. Go to Test 3.
  - b. No. Repair open in (LBE/W) wire.
- Using TEST CONNECTOR KIT (Part Number: HD-41404), test continuity between [280B] terminal 16 and ground.
- 2. Is continuity present?
  - a. Yes. Repair short to ground in (LBE/W) wire.
  - b. No. Replace WHIM.

Description	Part Number	Qty.
TEST CONNECTOR KIT	HD-41404	1
BREAKOUT BOX	HD-50390-1	1
BCM OVERLAY	HD-50390-2-P	1

Table 1	. Intermittent	Volume	Level Front	or Rear	Headsets	Diagnostic	Faults
---------	----------------	--------	-------------	---------	----------	------------	--------

Front and rear headset malfunction
Headset common circuit shorted low or open
Wireless headset interface module malfunction

- 1. Reset headsets to factory default settings.
- 2. Do headsets work properly?
  - a. Yes. Headsets are working properly.
  - b. No. Go to Test 2.
- 1. Turn IGN OFF.
- 2. Disconnect WHIM [280] and radio [27].
- 3. Connect BREAKOUT BOX (Part Number: HD-50390-1), leaving radio disconnected.
- 4. Verify BCM OVERLAY (Part Number: HD-50390-2-P) is in position on BOB.
- 5. Using **TEST CONNECTOR KIT (Part Number:HD-41404)**, test resistance between [280B] terminal 14 and breakout box terminal E3.
- 6. Is resistance less than 0.5 ohm?
  - a. Yes. Go to Test 3.
  - b. No. Repair open in (BK/PK) wire.
- 1. Using **TEST CONNECTOR KIT (Part Number:HD-41404)**, test continuity between [280B] terminal 14 and ground.
- 2. Is continuity present?
  - a. Yes. Repair short to ground in (BK/PK) wire.
  - b. No. Replace WHIM.

Wire traces on wiring diagrams are labeled with alpha codes. Refer to Table 1.

For Solid Color Wires: See Figure 1. The alpha code identifies wire color.

For Striped Wires: The code is written with a slash (/) between the solid color code and the stripe code. For example, a trace labeled GN/Y is a green wire with a yellow stripe.

See **Figure 1**. On wiring diagrams and in service/repair instructions, connectors are identified by a number in brackets []. The letter inside the brackets identifies whether the housing is a socket or pin housing.

**A=Pin:** The letter A and the pin symbol after a connector number identifies the pin side of the terminal connectors.

**B=Socket:** The letter B the socket symbol after a connector number identifies the socket side of the terminal connectors.

Other symbols found on the wiring diagrams include the following:

**Diode:** The diode allows current flow in one direction only in a circuit.

Wire break: The wire breaks are used to show option variances or page breaks.

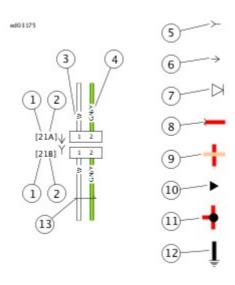
**No Connection:** Two wires crossing over each other in a wiring diagram that are shown with no splice indicating they are not connected together.

**Circuit to/from:** This symbol is used to identify there is a more complete circuit diagram on another page. The symbol is also identifying the direction of current flow.

**Splice:** Splices are where two or more wires are connected together along a wiring diagram. The location of the splice indicated in the wiring diagram is not the true location of the splice in the actual harness but to identify that the wires are spliced to that circuit.

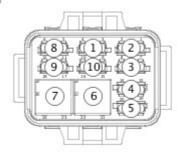
**Ground:** Grounds can be classified as either clean or dirty grounds. Clean grounds are identified by a (BK/GN) wire and are normally used for sensors or modules. These grounds usually do not have electric motors, coils or anything that may cause electrical interference on the ground circuit. The dirty grounds are identified by a (BK) wire and are used for components that are not as sensitive to electrical interference.

**Twisted pair:** This symbol indicates the two wires are twisted together in the harness. This minimizes the circuit's electromagnetic interference from external sources. If repairs are necessary to these wires they should remain as twisted wires.



1	Connector number
2	Terminal code (A=pin, B=socket)
3	Solid wire color
4	Striped wire color
5	Socket symbol
6	Pin symbol
7	Diode
8	Wire break
9	No connection
10	Circuit to/from
11	Splice
12	Ground
13	Twisted pair

Figure 1. Connector/Wiring Diagram Symbols



1	System power
2	Battery
3	Fork lock
4	Spare
5	Spare
6	Cooling relay
7	P&A relay
8	Radio
9	P&A
10	Cooling

Figure 2. Fuse Block [64B]

Table 1. Wire Color Codes

BE	Blue
ВК	Black
BN	Brown
GN	Green
GY	Gray
LBE	Light Blue
LGN	Light Green
0	Orange

PK	Pink
R	Red
TN	Tan
V	Violet
W	White
Υ	Yellow

# WIRING DIAGRAM LIST

FIGURE NUMBER

Front Lighting and Hand Controls: 2018 FLHTKSE	Figure 1.
Fairing Harness: 2018 FLHTKSE	Figure 2.
Main Harness (1 of 4): 2018 FLHTKSE	Figure 3.
Main Harness (2 of 4): 2018 FLHTKSE	Figure 4.
Main Harness (3 of 4): 2018 FLHTKSE	Figure 5.
Main Harness (4 of 4): 2018 FLHTKSE	Figure 6.
Rear Lighting: 2018 FLHTKSE	Figure 7.
Radio: 2018 FLHTKSE	Figure 8.

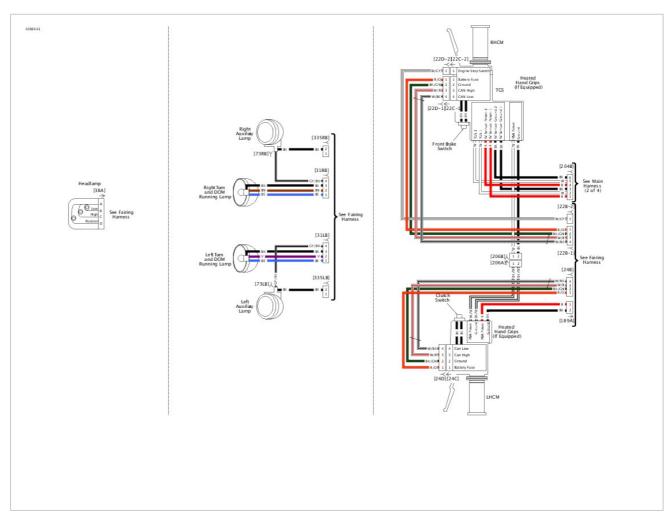


Figure 1. Front Lighting and Hand Controls: 2018 FLHTKSE

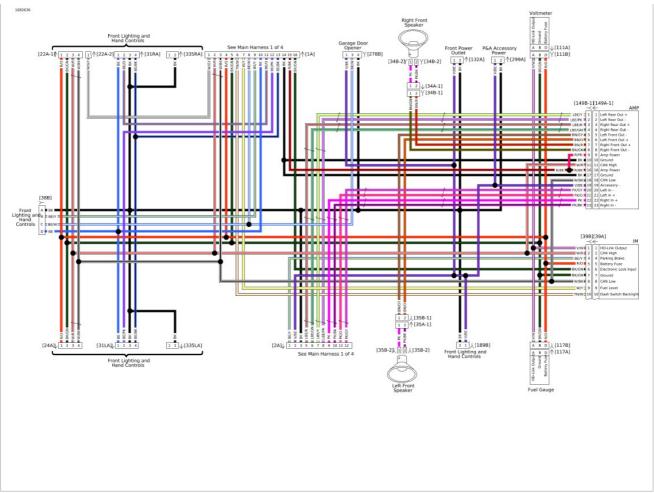


Figure 2. Fairing Harness: 2018 FLHTKSE

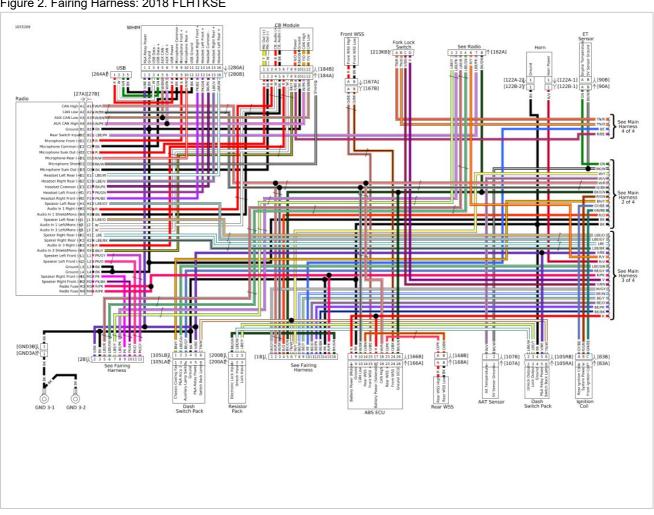


Figure 3. Main Harness (1 of 4): 2018 FLHTKSE

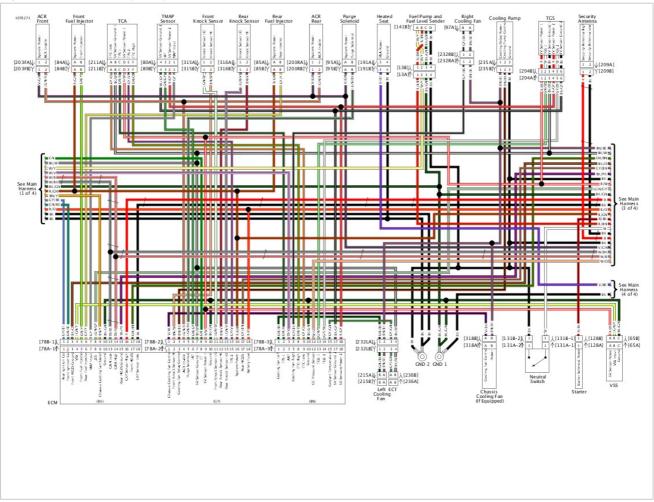


Figure 4. Main Harness (2 of 4): 2018 FLHTKSE

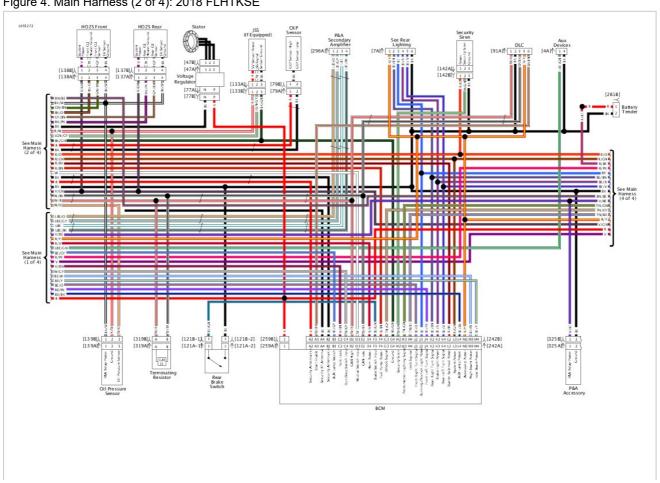


Figure 5. Main Harness (3 of 4): 2018 FLHTKSE

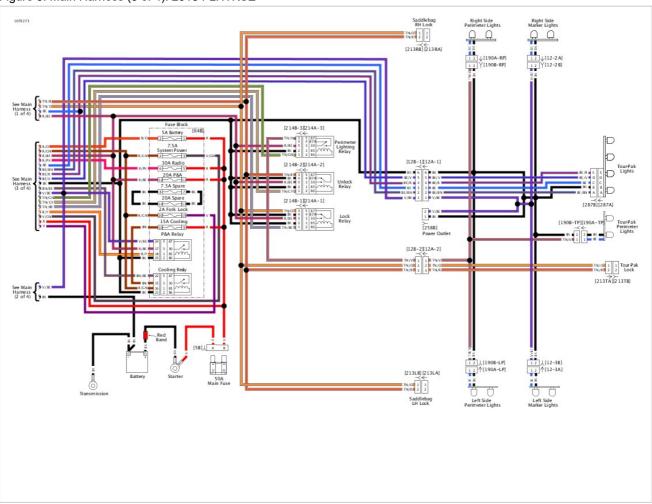


Figure 6. Main Harness (4 of 4): 2018 FLHTKSE

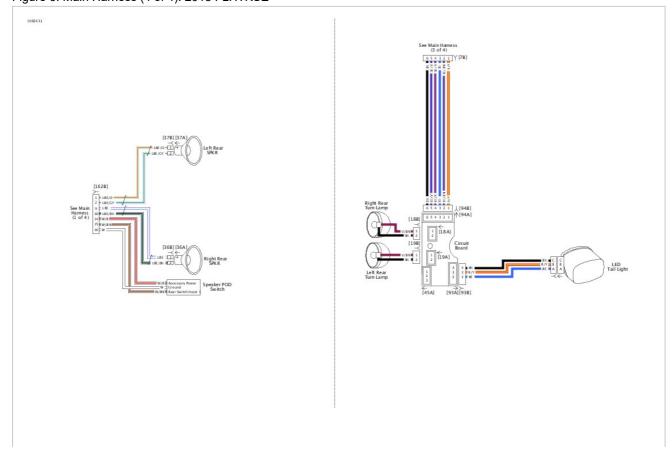


Figure 7. Rear Lighting: 2018 FLHTKSE

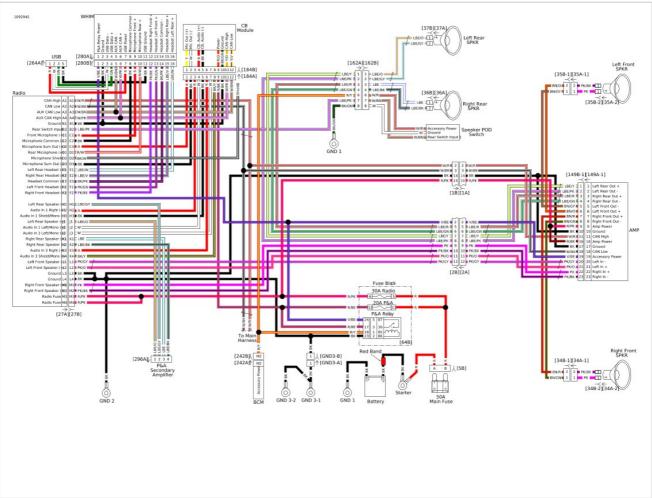


Figure 8. Radio: 2018 FLHTKSE

Refer to **Table 1**. On the motorcycle, a connector can be identified by its function and location. The connectors in the table are not found in service manual.

The place (number of wire cavities of a housing) and color of the connector can also aid identification.

On wiring diagrams and in service/repair instructions, connectors are identified by a number in brackets.

The repair instructions in service manual are by connector type.

Table 1. Connector Locations

Table 1. C	onnector Locations		1	1
[12-2]	Tour-Pak	3-place Molex MX 150 Sealed (BK)	Gray	In front of Tour-Pak
[149- 1]	Audio amplifier	23-place Tyco Superseal Sealed	Breakout Box	Inner fairing - on top of radio
[190- T]	Interior lamp	2-place Tyco 070 Multilock Unsealed (BK)	Gray	Inside Tour-Pak top
[190- R]	Right saddlebag lamp	2-place Tyco 070 Multilock Unsealed (BK)	Gray	Inside Tour-Pak bottom
[190- L]	Left saddlebag lamp	2-place Tyco 070 Multilock Unsealed (BK)	Gray	Inside Tour-Pak bottom
[191]	Heated seat	4-place Deutsch DT Sealed (BK)	Black	Under seat
[200]	Resistor pack	3-place Molex MX 150 Sealed (BK)	Gray	Inner fairing
[213K]	Fork lock	4-way Delphi GT 150 3.5mm Sealed (BK)	Gray	Bottom of fork lock
[213L]	Saddlebag lock (LH)	2-place Deutsch DTM Sealed (BK)	Brown	Outside LH saddlebag
[213R]	Saddlebag lock (RH)	2-place Deutsch DTM Sealed (BK)	Brown	Outside RH saddlebag

[213T]	Tour-Pak lock	2-place Deutsch DTM Sealed (BK)	Brown	Inside Tour-Pak cover liner
[214- 1]	Lock relay	5-place Bosch Relay Block (BK)	Purple	Behind right side cover
[214- 2]	Unlock relay	5-place Bosch Relay Block (BK)	Purple	Behind right side cover
[214- 3]	Perimeter lighting relay	5-place Bosch Relay Block (BK)	Purple	Behind right side cover
[264]	USB inline	Molex MX150 4-way	Gray	Inner fairing
[278]	Garage door opener	4-place Deutsch DTM Sealed (BK)	Brown	Inside outer fairing
[280]	WHIM	16-way Molex MX150	Gray	Inner fairing
[296]	P&A secondary audio amplifier	4-place Molex MX 150 Sealed (BK)	Gray	Under seat
[335L]	Left auxiliary lamp	2-way JAE MX19 Sealed (BK)	Yellow	Inside left front turn signal/aux lamp support
[335R]	Right auxiliary lamp	2-way JAE MX19 Sealed (BK)	Yellow	Inside right front turn signal/aux lamp support
	WHIM micro USB	Micro USB		Under seat

Table 1. Fairing Harness [1]

able 1. Fairing Harness [1]			
1	W/GY	Run/stop switch input	
2	W/R	CAN high	
3	W/BK	CAN low	
4	R/O	Battery fuse	
5	BK/GN	Ground	
6	BK	Ground	
7	W/Y	Fuel level	
8	BE/W	High beam headlamp	
9	BE/Y	Low beam headlamp	
10	BE	Running lights power	
11	BE/O	Right front turn signal	
12	BE/PK	Left front turn signal	
13	BE/BK	Running/position light power	
14	BK	Ground	
15	R/BK	Amp power	
16	-	N/C	

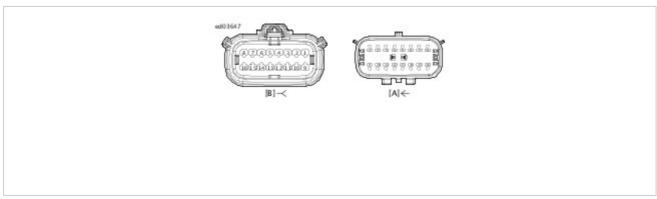


Figure 1. Fairing Harness [1]

Table 2. Fairing Harness [2]

Table 2. Fairing Harriess [2]				
1	BE/Y	Parking brake		

2	V/BE	P&A relay power
3	ВК	Ground
4	TN/W	Dash switch backlight
5	LBE	Speaker right rear out (+)
6	LBE/BK	Speaker right rear out (-)
7	LBE/O	Speaker left rear out (+)
8	LBE/GY	Speaker left rear out (-)
9	PK	Speaker right front (+)
10	PK/BK	Speaker right front (-)
11	PK/O	Speaker left front (+)
12	PK/GY	Speaker left front (-)

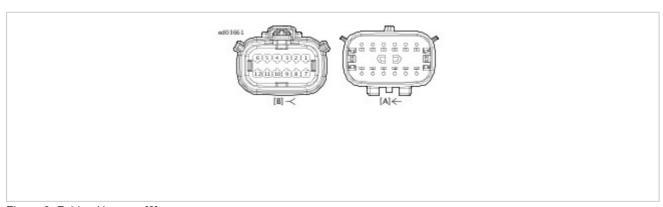


Figure 2. Fairing Harness [2]

Table 3. Tour-Pak [12-2]

	Table 6. Tour-I alt [12-2]		
1	TN/V	Perimeter lighting relay power	
2	TN/O	Lock relay power	
3	TN/R	Unlock relay power	

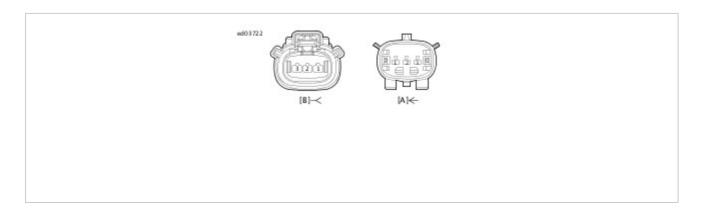


Table 4. Audio Amplifier 1 [149-1]

Table 4. Audio	Amplitier 1 [149-1	J
1	LBE	Left rear out +
2	LBE/BK	Left rear out -
3	LBE/O	Right rear out +
4	LBE/GY	Right rear out -
5	BN/O	Left front out +
6	BN/GY	Left front out -
7	BN/PK	Right front out +
8	BN/GN	Right front out -
9	R	Amp power
10	ВК	Ground
11	W/R	CAN +
12	1	N/C
13	1	N/C
14	1	N/C
15	1	N/C
16	R	Amp power
17	ВК	Ground
18	W/BK	CAN -
19	V/BE	P&A relay power
20	PK/GY	Left in (-)
21	PK/O	Left in (+)
22	PK	Right in (+)
23	PK/BK	Right in (-)



Figure 4. Audio Amplifier 1 [149-1]

Table 5. XM Antenna [185]

1	ВК	Coax cable

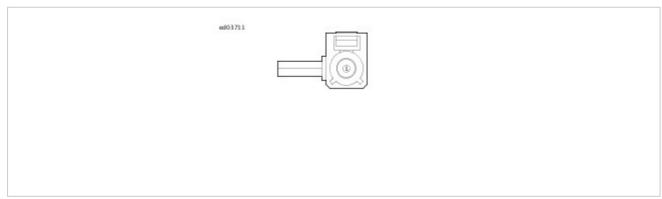


Figure 5. XM Antenna [185]

Table 6. Interior Lamp [190-T]

1	TN/V	Perimeter lighting relay power
2	ВК	Ground

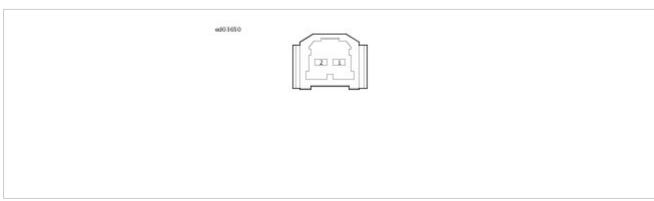


Figure 6. Interior Lamp [190-T]

Table 7. Right Saddlebag Lamp [190-R]

Table 7: Tagit Gadalebag Earlip [100 Tq		
	l l	

1	TN/V	Perimeter lighting relay power
2	BK	Ground

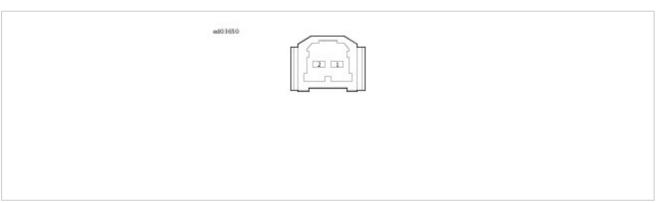


Figure 7. Right Saddlebag Lamp [190-R]

Table 8. Left Saddlebag Lamp [190-L]

1	TN/V	Perimeter lighting relay power
2	ВК	Ground

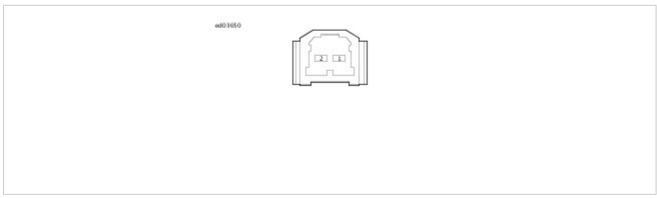


Figure 8. Left Saddlebag Lamp [190-L]

Table 9. Heated Seat [191]

Table 3. Heated Geat [191]		
1	-	N/C
2	-	N/C
3	V/BE	P&A power
4	BK	Ground

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Figure 9. Heated Seat [191]

Table 10. Resistor Pack [200]

Table 16. Heddetel 1 dek [200]		
1	BK/GN	Electronic lock input
2	LBE/W	Switch output 2
3	LBE/Y	Switch output 1



Figure 10. Resistor Pack [200]

Table 11. Fork Lock [213K]

А	TN/R	Unlock relay power
В	TN/O	Lock relay power
С	V/BN	Fork lock
D	V/GN	System power fuse

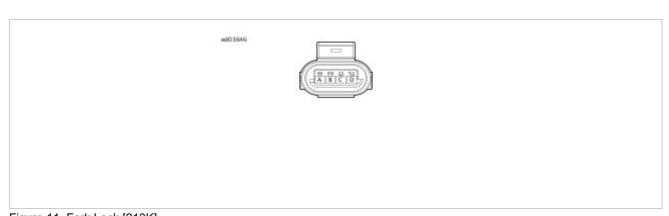


Figure 11. Fork Lock [213K]

## Table 12. Saddlebag Lock (LH) [213L]

1	TN/O	Lock relay power
2	TN/R	Unlock relay power



Figure 12. Saddlebag Lock (LH) [213L]

Table 13. Saddlebag Lock (RH) [213R]

1	TN/O	Lock relay power
2	TN/R	Unlock relay power



Figure 13. Saddlebag Lock (RH) [213R]

Table 14. Tour Pak Lock [213T]

1	TN/O	Lock relay power
2	TN/R	Unlock relay power

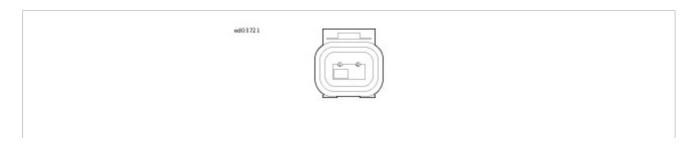


Figure 14. Tour Pak Lock [213T]

Table 15. Lock Relay [214-1]

	71. 1	
1	TN/BE	Lock signal
2	ВК	Ground
3	TN/O	Lock relay power
4	ВК	Ground
5	R/BE	P&A fuse

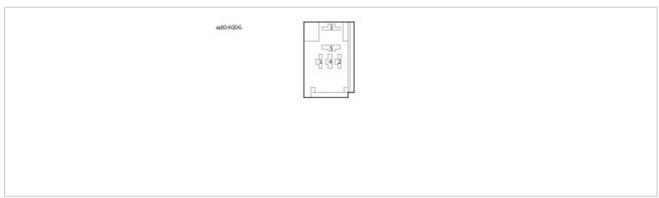


Figure 15. Lock Relay [214-1]

Table 16. Unlock Relay [214-2]

1	TN/GY	Unlock signal
2	ВК	Ground
3	TN/R	Unlock relay power
4	ВК	Ground
5	R/BE	P&A fuse

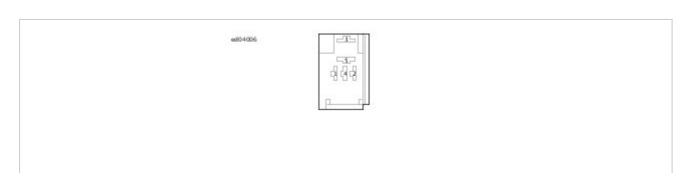


Figure 16. Unlock Relay [214-2]

Table 17. Perimeter Lighting Relay [214-3]

	3 3	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,
1	TN/GN	Perimeter lighting signal
2	BK	Ground
3	TN/V	Lock relay power
4	-	N/C
5	R/BE	P&A fuse

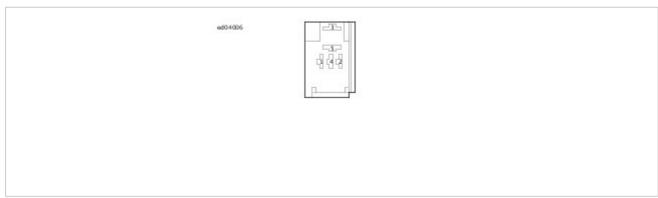


Figure 17. Perimeter Lighting Relay [214-3]

Table 18. BCM [242]

Table 18. BCIVI	[242]	
A1	-	N/C
A2	R	Security antenna high
А3	W/BN	Start enable
A4	ВК	Security RF antenna
B1	-	N/C
B2	ВК	Security antenna low
В3	BE/GY	Aux lamp switch
B4	-	N/C
C1	-	N/C
C2	V/BN	Fork lock
1		·

C3	W/BE	Ignition/accessory switch input
C4	W/GY	Engine stop switch input
D1	-	N/C
D2	W/R	CAN high
D3	W	Neutral switch input
D4	-	N/C
E1	-	N/C
E2	W/BK	CAN low
E3	W/O	Oil pressure switch input
E4	R/V	Horn power
F1	-	N/C
F2	-	N/C
F3	BE/GN	Brake switch input
F4	R/BN	Fuel pump power
G1	-	N/C
G2	-	N/C
G3	TN/GY	Unlock signal
G4	BK/GN	Ground
H1	-	N/C
H2	W/GN	Security siren
H3	TN/GN	Perimeter lighting signal
H4	TN/BE	Lock signal
J1	-	N/C
J2	BE/O	Right front turn signal
J3	BE	Running/position lights
J4	BE/PK	Left front turn signal
K1	-	N/C
K2	BE/BN	Right rear turn signal
K3	BE/R	Brake lamp power

K4	BE/V	Left rear turn signal
L1	-	N/C
L2	R/BK	Starter solenoid power
L3	R/GN	System power
L4	BE/BK	Front running/fog light power
M1	-	N/C
M2	R/Y	Accessory power
M3	BE/W	High beam power
M4	BE/Y	Low beam power

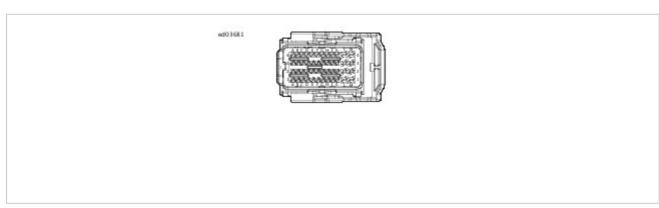


Figure 18. BCM [242]

Table 19. USB In-line [264]

1	R	Power
2	W	Data +
3	GN	Data -
4	ВК	USB ground



Figure 19. Micro USB [264]

Table 20. Garage Door Opener [278]

	9	
1	V/BE	P&A relay power
2	-	N/C
3	BE/W	High beam headlight
4	ВК	Ground



Figure 20. Garage Door Opener [278]

Table 21. WHIM [280]

able 21. Whilly [200]		
1	V/BE	P&A relay power
2	ВК	Power ground
3	W	USB data -
4	GN	USB data +
5	W/BN	AUX can -
6	W/PK	AUX can +
7	R	USB power
8	ВК	Microphone -
9	R	Microphone front +
10	R/W	Microphone rear +
11	ВК	USB ground
12	PK/BE	Headset RF +
13	PK/GN	Headset LF +
14	BK/PK	Headset -

15	LBE/V	Headset RR +
16	LBE/W	Headset LR +

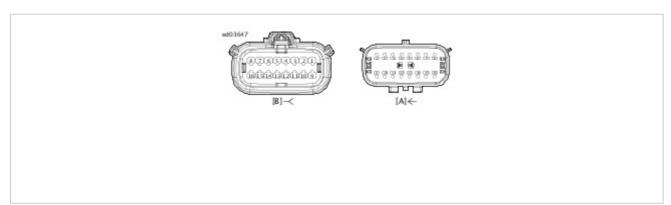


Figure 21. WHIM [280]

Table 22. P&A Secondary Audio Amplifier [296]

rable 22. Fax Coolinary Addio Amplifici [200]		
1	LBE/O	Speaker left rear (+)
2	LBE/GY	Speaker left rear (-)
3	LBE	Speaker right rear (+)
4	LBE/BK	Speaker right rear (-)

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Figure 22. P&A Secondary Audio Amplifier [296]

Table 23. Left Auxiliary Lamp [335L]

rabio 20. Lott taxiiiai y Lamp [6002]		
1	-	N/C
2	BK	Ground

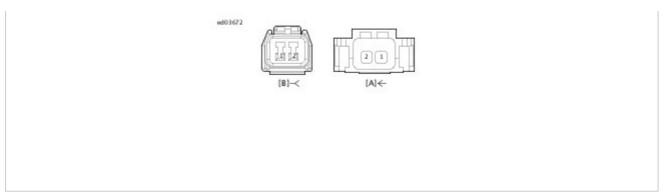


Figure 23. Left Auxiliary Lamp [335L]

Table 24. Right Auxiliary Lamp [335R]

	, , ,	-
1	-	N/C
2	BK	Ground

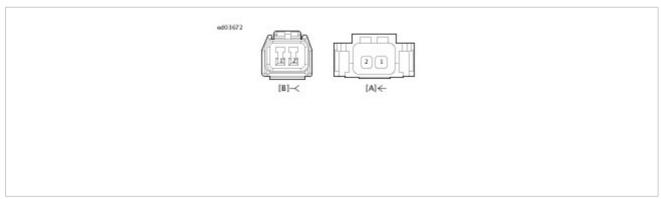


Figure 24. Right Auxiliary Lamp [335R]

Table 25. WHIM Micro USB

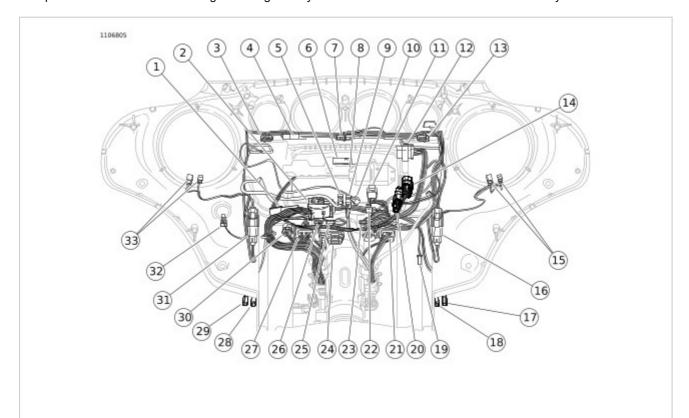
1	R	USB power
2	W	USB data -
3	GN	USB data +
4	-	Drain
5	ВК	USB ground

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Figure 25. WHIM Micro USB

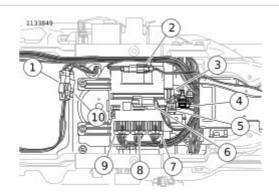
Some components and connectors are not easily located on the motorcycle. The following figures show locations for these components and connectors. The figures are generally ordered from front to back around the motorcycle.



1	Power lock resistor pack [200]
2	Radio [27]
3	Voltmeter [111]
4	P&A power [299]
5	USB
6	CB module [184]
7	IM [39]
8	P&A audio [280]
9	Antenna [51]
10	GPS [193]
11	Garage door opener [278]
12	Audio amplifer front [149-1]
13	Fuel gauge [117]
14	WHIM [280]

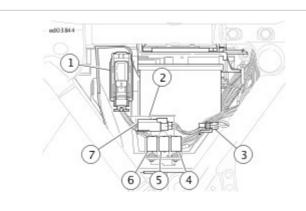
15	Left front speaker [35-2]
16	Left front speaker [35-1]
17	Left auxiliary lamp [335L]
18	Left front turn signal [31L]
19	Heated hand grip [189]
20	USB in-line [264]
21	Main to interconnect harness [2]
22	XM radio [185]
23	LHCM [24]
24	Headlamp [38]
25	RHCM [22-2]
26	RHCM [22-1]
27	Main to interconnect harness [1]
28	Right front turn signal [31R]
29	Right auxiliary lamp [335R]
30	TGS jumper harness [204]
31	Right front speaker [34-1]
32	Power outlet [132]
33	Right front speaker [34-2]

Figure 1. Behind Fairing



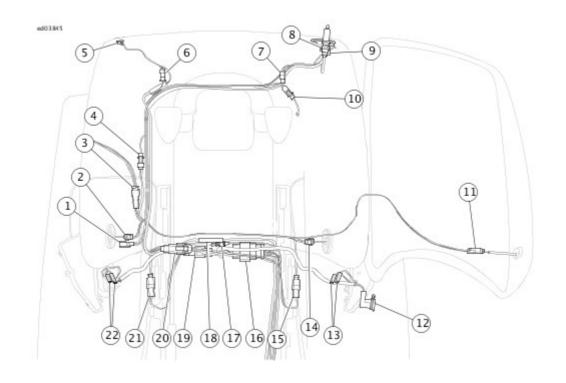
1	Rear lighting [7]
2	Fuel tank harness [13]
3	Security antenna [209]
4	WHIM micro USB
5	Purge solenoid [95]
6	Heated seat [191]
7	ECM [78-1] (BK)
8	ECM [78-2] (GY)
9	ECM [78-3] (BN)
10	Rear audio [326]

Figure 2. Under Seat



1	ABS [166]
2	Front HO2S [137] (behind [138])
3	Rear WSS [168]
4	Perimeter lighting relay [214-3]
5	Unlock relay [214-2]
6	Lock relay [214-1]
7	Rear HO2S [138]

Figure 3. Behind Right Side Cover



1	Power outlet [258]
2	Right saddlebag lamp [190-R]
3	Tour-Pak lock [213T]
4	Right side maker lights [12-2B]
5	CB antenna
6	CB ground
7	AM/FM ground
8	AM/FM antenna [51]
9	Tour-Pak lights [287]
10	Left side marker lights [12-3B]
11	Interior lamp [190-T]
12	Left rear speaker [37]
13	Left saddlebag lamp [190-L]
14	Saddlebag lock LH [213L]
15	Rear audio [162]
16	AM/FM antenna [51]

17	CB antenna [104]
18	Tour-Pak lights [12-1]
19	Tour-Pak [12-2]
20	Saddlebag lock RH [213R]
21	Right rear speaker [36]

Figure 4. Tour Pak

Refer to the table below for a list of common acronyms and abbreviations.

Table 1. Acronyms and Abbreviations

Table 1. Acronyms and Abbreviations	
A	Amperes
AAT	Ambient air temperature
ABS	Anti-lock braking system
AC	Alternating current
ACC	Accessory position on ignition switch
ACR	Automatic compression release
AGM	Absorbed glass mat (battery)
Ah	Ampere-hour
AIS	Active intake solenoid
AWG	American wire gauge
B+	Battery voltage
bar	Bar
BAS	Bank angle sensor
ВСМ	Body control module
вов	Breakout box
BTDC	Before top dead center
°C	Celsius (Centigrade)
CA	California
CAL	Calibration
CAN	Controller area network
СВ Тх	CB send transmission
CB Rx	CB receive transmission
СС	Cubic centimeters
CCA	Cold cranking amps
ccw	Counterclockwise

CKP	Crankshaft position
cm	Centimeters
cm <sup>3</sup>	Cubic centimeters
CW	Clockwise
DC	Direct current
DLC	Data link connector
DOM	Domestic
DOT	Department of Transportation
DTC	Diagnostic trouble code
DVOM	Digital volt ohm meter
ECM	Electronic control module
ECT	Engine coolant temperature
ECU	Electronic control unit
EEPROM	Electrically erasable programmable read only memory
EFI	Electronic fuel injection
EHCU	Electro hydraulic control unit
ET	Engine temperature
ETC	Electronic throttle control
EVAP	Evaporative emissions control system
°F	Fahrenheit
fl oz	Fluid ounce
FPS	Fuel pressure sensor
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
HCU	Hydraulic control unit
HDI	Harley-Davidson International
HD-Link	Networking system
H-DSSS	Harley-Davidson smart security system
HFM	Hands-free mode
HFSM	Hands-free security module
Hg	Mercury
H02S	Heated oxygen sensor
hp	Horsepower
hr	Hour
IAC	Idle air control
IAT	Intake air temperature
IC	Instrument cluster
ID	Inside diameter
IGN	Ignition light/key switch position
IM	Instrument module
in	inch
in <sup>3</sup>	Cubic inch
INJ PW	Injector pulse width
INTCM	Intercom
in-lbs	Inch pounds
JSS	Jiffy stand sensor
kg	Kilogram
km	Kilometer
km/h	Kilometers per hour
kPa	Kilopascal

I	I
kW	Kilowatt
KS	Knock sensor
L	Liter
lb	Pounds
LCD	Liquid crystal display
LED	Light emitting diode
LH	Left hand
LHCM	Left hand control module
LP	License plate
LT	Left
mA	Milliampere
MAP	Manifold absolute pressure
max	Maximum
mi	Mile
min	Minimum
mL	Milliliter
mm	Millimeter
mph	Miles per hour
ms	Millisecond
Nm	Newton-meter
NIM	Navigation interface module
NiMH	Nickel metal hydride
N/A	Not applicable
O2	Oxygen
OD	Outside diameter
ОЕМ	Original equipment manufacturer
oz	Ounce
P&A	Parts and Accessories

Part No.	Part number
PIN	Personal identification number
PND	Personal navigation device
psi	Pounds per square inch
PWM signal	Pulse width modulated signal
qt	Quart
RAD	Radio
RCM	Reverse control module
RDS	Radio data system
RES	Reserve mark on fuel supply valve
RH	Right hand
RHCM	Right hand control module
rpm	Revolutions per minute
RT	Right
s	Seconds
SCFH	Cubic feet per hour at standard conditions
SDARS	Satellite digital audio radio service
SPDO	Speedometer
SPKR	Speaker
STT	Stop/tail/turn
ТА	Traffic announcement
TCA	Throttle control actuator
TDC	Top dead center
TGS	Twist grip sensor
TPMS	Tire pressure monitoring system
TPS	Throttle position sensor
TSM	Turn signal module
TSSM	Turn signal/security module
тт	Telltale

USB	Universal serial bus
V	Volt
VAC	Volts of alternating current
VDC	Volts of direct current
VIN	Vehicle identification number
VR	Voice recognition
VSS	Vehicle speed sensor
W	Watt
WA	Weather alert
WHIM	Wireless headset interface module
WSS	Wheel speed sensor

Table 1. Metric Conversions

Table 1	I. Metric (	Conver	sions											
.1	.0039	25	.9842	58	2.283	91	3.582	.001	.025	.6	15.240	1- 15/16	49.21	5
.2	.0078	26	1.024	59	2.323	92	3.622	.002	.051	5/8	15.875	2	50.80	3.
.3	.0118	27	1.063	60	2.362	93	3.661	.003	.076	11/16	17.462	2- 1/16	52.39	3
.4	.0157	28	1.102	61	2.401	94	3.701	.004	.102	.7	17.780	2.1	53.34	7.
.5	.0197	29	1.142	62	2.441	95	3.740	.005	.127	3/4	19.050	2-1/8	53.97	3-
.6	.0236	30	1.181	63	2.480	96	3.779	.006	.152	.8	20.320	2- 3/16	55.56	9
.7	.0275	31	1.220	64	2.519	97	3.819	.007	.178	13/16	20.638	2.2	55.88	3
.8	.0315	32	1.260	65	2.559	98	3.858	.008	.203	7/8	22.225	2-1/4	57.15	3-
.9	.0354	33	1.299	66	2.598	99	3.897	.009	.229	.9	22.860	2.3	58.42	11
1	.0394	34	1.338	67	2.638	100	3.937	.010	.254	15/16	23.812	2- 5/16	58.74	3
2	.0787	35	1.378	68	2.677	101	3.976	1/64	.397	1	25.40	2-3/8	60.32	3-
3	.1181	36	1.417	69	2.716	102	4.016	.020	.508	1- 1/16	26.99	2.4	60.96	:
4	.1575	37	1.456	70	2.756	103	4.055	.030	.762	1.1	27.94	2- 7/16	61.91	18
5	.1968	38	1.496	71	2.795	104	4.094	1/32	.794	1-1/8	28.57	2-1/2	63.50	3-
6	.2362	39	1.535	72	2.834	105	4.134	.040	1.016	1- 3/16	30.16	2- 9/16	65.09	3
7	.2756	40	1.575	73	2.874	106	4.173	.050	1.270	1.2	30.48	2.6	66.04	15
8	.3149	41	1.614	74	2.913	107	4.212	.060	1.524	1-1/4	31.75	2-5/8	66.67	
9	.3543	42	1.653	75	2.953	108	4.252	1/16	1.588	1.3	33.02	2- 11/16	68.26	1
			]			I				]		l	]	П

10	.3937	43	1.693	76	2.992	109	4.291	.070	1.778	1- 5/16	33.34	2.7	68.58	
11	.4331	44	1.732	77	3.031	110	4.331	.080	2.032	1-3/8	34.92	2-3/4	69.85	4.
12	.4724	45	1.772	78	3.071	111	4.370	.090	2.286	1.4	35.56	2.8	71.12	3
13	.5118	46	1.811	79	3.110	112	4.409	.1	2.540	1- 7/16	36.51	2- 13/16	71.44	2
14	.5512	47	1.850	80	3.149	113	4.449	1/8	3.175	1-1/2	38.10	2-7/8	73.02	4.
15	.5905	48	1.890	81	3.189	114	4.488	3/16	4.762	1- 9/16	39.69	2.9	73.66	2
16	.6299	49	1.929	82	3.228	115	4.527	.2	5.080	1.6	40.64	2- 15/16	74.61	5
17	.6693	50	1.968	83	3.268	116	4.567	1/4	6.350	1-5/8	41.27	3	76.20	4-
18	.7086	51	2.008	84	3.307	117	4.606	.3	7.620	1- 11/16	42.86	3- 1/16	77.79	2
19	.7480	52	2.047	85	3.346	118	4.645	5/16	7.938	1.7	43.18	3.1	78.74	7
20	.7874	53	2.086	86	3.386	119	4.685	3/8	9.525	1-3/4	44.45	3-1/8	79.37	4-
21	.8268	54	2.126	87	3.425	120	4.724	.4	10.160	1.8	45.72	3- 3/16	80.96	9
22	.8661	55	2.165	88	3.464	121	4.764	7/16	11.112	1- 13/16	46.04	3.2	81.28	2
23	.9055	56	2.205	89	3.504	122	4.803	1/2	12.700	1-7/8	47.62	3-1/4	82.55	4.
24	.9449	57	2.244	90	3.543	123	4.842	9/16	14.288	1.9	48.26	3.3	83.82	11

Unless otherwise specified, all fluid volume measurements in this manual are expressed in United States (U.S.) units-of-measure. See below:

- 1 pint (U.S.) = 16 fluid ounces (U.S.)
- 1 quart (U.S.) = 2 pints (U.S.) = 32 fl. oz. (U.S.)
- 1 gallon (U.S.) = 4 quarts (U.S.) = 128 fl. oz. (U.S.)

Fluid volume measurements in this manual include the metric system equivalents. In the metric system, 1 liter (L) = 1,000 milliliters (mL). To convert between U.S. units-of-measure and metric units-of-measure, refer to the following:

- fluid ounces (U.S.) x 29.574 = milliliters
- pints (U.S.) x 0.473 = liters
- quarts (U.S.) x 0.946 = liters
- gallons (U.S.) x 3.785 = liters
- milliliters x 0.0338 = fluid ounces (U.S.)
- liters x 2.114 = pints (U.S.)
- liters x 1.057 = quarts (U.S.)
- liters x 0.264 = gallons (U.S.)

Fluid volume measurements in this manual do not include the British Imperial (Imp.) system equivalents. The following conversions exist in the British Imperial system:

- 1 pint (Imp.) = 20 fluid ounces (Imp.)
- 1 quart (Imp.) = 2 pints (Imp.)
- 1 gallon (Imp.) = 4 quarts (Imp.)

Although the same unit-of-measure terminology as the U.S. system is used in the British Imperial (Imp.) system, the actual volume of each British Imperial unit-of-measure differs from its U.S. counterpart. The U.S. fluid ounce is larger than the British Imperial fluid ounce. However, the U.S. pint, quart, and gallon are smaller than the British Imperial pint, quart, and gallon, respectively. To convert between U.S. units and British Imperial units, refer to the following:

- fluid ounces (U.S.) x 1.042 = fluid ounces (Imp.)
- pints (U.S.) x 0.833 = pints (Imp.)
- quarts (U.S.) x 0.833 = quarts (Imp.)
- gallons (U.S.) x 0.833 = gallons (Imp.)
- fluid ounces (Imp.) x 0.960 = fluid ounces (U.S.)
- pints (Imp.) x 1.201 = pints (U.S.)
- quarts (Imp.) x 1.201 = quarts (U.S.)
- gallons (Imp.) x 1.201 = gallons (U.S.)

The U.S. units of torque, foot pounds and inch pounds, are used in this manual. To convert units, use the following equations:

- foot pounds (ft-lbs) X 12.00000 = inch pounds (in-lbs)
- inch pounds (in-lbs) X 0.08333 = foot pounds (ft-lbs)

All metric torque specifications are written in Newton-meters (Nm). To convert metric to United States units and United States to metric, use the following equations:

- Newton meters (Nm) X 0.737563 = foot pounds (ft-lbs)
- Newton meters (Nm) X 8.85085 = inch pounds (in-lbs)
- foot pounds (ft-lbs) X 1.35582 = Newton meters (Nm)
- inch pounds (in-lbs) X 0.112985 = Newton meters (Nm)

INSIDE BACK COVER GOES HERE

Figure 1.

OUTSIDE BACK COVER GOES HERE	

Figure 1.