



INSTRUCTIONS

-J03330

2006-08-30

ONE AND ONE-HALF INCH SHIFT GAUGE KIT

GENERAL

Kit Number

74489-04

Models

For model fitment information, please see the P&A Retail Catalog or the Parts and Accessories section of www.harley-davidson.com (English only).

Additional Parts Required

To complete installation, the shift gauge kit will require a gauge housing kit. For Softail models, a digital to analog converter bracket kit (Part Number 72390-04) will also be required. These items are available from a Harley-Davidson Dealer.

⚠ WARNING

Rider and passenger safety depend upon the correct installation of this kit. Use the appropriate service manual procedures. If the procedure is not within your capabilities or you do not have the correct tools, have a Harley-Davidson dealer perform the installation. Improper installation of this kit could result in death or serious injury. (00333b)

NOTE

This instruction sheet references Service Manual information. A Service Manual for your model motorcycle is required for this installation and is available from a Harley-Davidson Dealer.

NOTICE

It is possible to overload your vehicle's charging system by adding too many electrical accessories. If the combined electrical accessories operating at any one time consume more electrical current than the vehicle's charging system can produce, the electrical consumption can discharge the battery and cause damage to the vehicle's electrical system. See an authorized Harley-Davidson dealer for advice about the amount of current consumed by additional electrical accessories or for necessary wiring changes. (00211c)

⚠ WARNING

When installing any electrical accessory, be certain not to exceed the maximum amperage rating of the fuse or circuit breaker protecting the affected circuit being modified. Exceeding the maximum amperage can lead to electrical failures, which could result in death or serious injury. (00310a)

NOTE

This kit requires up to 100 milliamps additional current from the electrical system.

Kit Contents

See Figure 16 and Table 1.

INSTALLATION

Prepare the Motorcycle

⚠ 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. **For EFI models:** Follow the instructions found in the Service Manual to purge the fuel supply of high pressure gasoline and remove the fuel supply line.
2. Follow the instructions found in the Service Manual to remove the seat and any side covers.

⚠ WARNING

To prevent accidental vehicle start-up, which could cause death or serious injury, disconnect negative (-) battery cable before proceeding. (00048a)

3. Disconnect negative (-) battery cable from the battery.

⚠ WARNING

Gasoline can drain from the carburetor fuel line when disconnected from fuel valve fitting. Gasoline is extremely flammable and highly explosive, which could result in death or serious injury. Wipe up spilled fuel immediately and dispose of rags in a suitable manner. (00256a)

4. **For carbureted models:** Turn the fuel supply valve to OFF. Remove the fuel line from the valve.
5. Follow the instructions in the Service Manual to remove the fuel tank.

Install the Bracket Kit and Shift Gauge

NOTE

Though the 1.5 inch shift gauge can be installed in a single bracket, up to three 1.5 inch gauges may be installed in a cluster bracket. Follow the instruction sheets found in the additional gauge kits through routing the wire harness, installing the gauges, wiring the power, sensor and ground leads, returning the motorcycle to service and testing each gauge.

1. Follow the bracket kit instructions to install the gauge bracket.



- See Figure 16. Obtain from shift gauge kit, the rubber isolation gasket (7) and the shift gauge (8).

NOTE

Lubricating the gasket with soap and water will make installation of the gasket and the gauge easier.

- Fit the perimeter groove in the rubber isolation gasket to the inside edge of the bracket and the tab of the isolation gasket to the square cutout in the bracket.
- Rotate the gauge to align the face legend horizontal to the rider and push in the gauge. The locating tab on the gauge will align with the locating notch in the gasket.

Install the Converter Box

For XL: See Figure 1.

- Position the digital to analog converter box (1) under the frame backbone (2).
- Using a cable tie through the left hand hole in the converter box flange, secure the converter to the wiring harness on the left.

For Softail: See Figure 2.

- Follow the instructions in the converter bracket kit (Part Number 72390-04) to install the converter bracket (1) on the frame bracket.
- Bolt on the digital to analog converter box (2) with the embedded connector facing up. Tighten to 14 **in-lbs** (1.6 Nm)

For Dyna: See Figure 3.

- Locate the digital to analog converter box under the seat.
- Cable tie the converter inside the large (service) loop of the main harness (1) which is cable tied (2) to the frame (3) at the front of the frame.

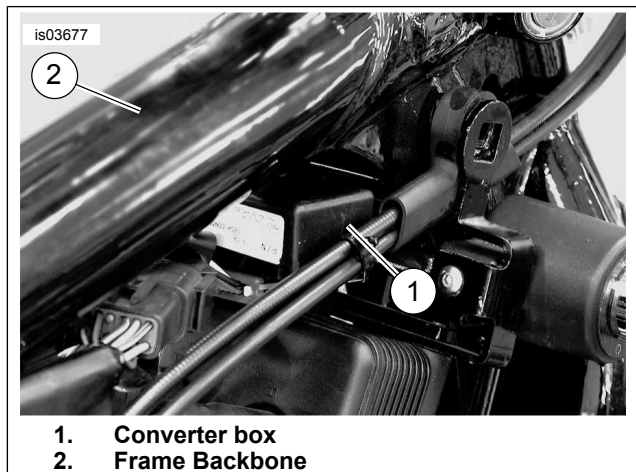


Figure 1. Converter Box (XL Custom Shown)

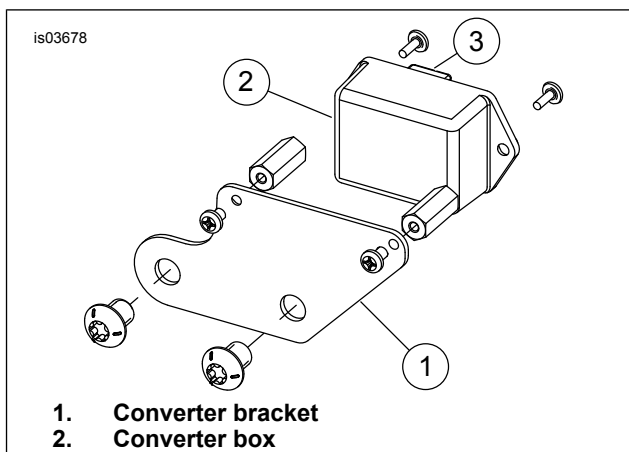


Figure 2. Softtail Bracket and Converter

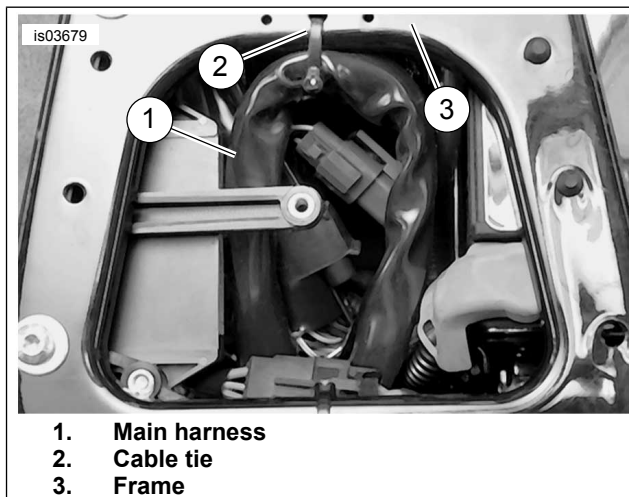


Figure 3. Dyna Main Harness Service Loop

For FLHR/C/I: See Figure 9.

- Use isopropyl alcohol to clean the surface of the backbone plate used as a ground in front of the battery.
- Using the double sided foam tape, secure the digital to analog converter box to the backbone plate.

Route the Wire Harness

NOTE

Before shortening the wire harness by trimming any unterminated wire lead, route the wire harness to all terminal locations and adjust as necessary during the installation to achieve a tight but flexible arrangement.

- See Figure 4. Mate the connector (1) on the wire harness to the connector on the digital to analog converter box.
For XL: Cable tie the shift gauge harness at the converter box to the main harness along the left side of the backbone.

NOTE

If necessary, locate the B+ connector [160B] on the main wire harness and route the connector and conduit to the B+ connector on the gauge wiring harness.

2. Layout the wiring harness conduit along the frame backbone and loosely locate the harness leads.
 - a. The junction of the LGN/V, orange and black unterminated leads and the single B+ connector will fall right in front of the seat post.
 - b. Mate the lead with the B+ connector (4) routed toward the B+ connector [160B] on the main wire harness.
 - c. Route the 4 unterminated leads (8) wrapped in conduit forward toward the gauge and bracket. **For XL Custom:** Double back the 4 unterminated wires in conduit toward the gauge and loosely secure the doubled harness with 2 cable ties without clipping off the ends of the ties.
 - d. The signal (LGN/V) lead (6) toward the data link connector [91A].
 - e. The ground (BK) lead (5) toward a ground stud.
 - f. **For all except XL:** The power (O) lead (7) will be spliced into an adapter plugged into the fuse box. **For XL:** The power (O) lead toward the rear fender lighting connector [7A].
 - g. Loosely secure the harness with cable ties. Leave the lead ends unclipped and continue to adjust leads and conduit for length and clearance from chafe and heat points.

Route the Signal Lead

1. Locate the gray data link connector [91A] for the model. **For XL:** Under the left side cover. **For Softail including FLSTN:** See Figure 5. Under the seat (1). **For Dyna:** Under the electrical caddy cover on the left side of the motorcycle. **For FLHR/C/I:** Under the right side cover.
2. Route the signal (LGN/V) lead from the shift gauge wiring harness to the data link connector [91A].
3. Cut the LGN/V wire 1.5 in. from the connector.
4. Splice lead from the connector to the LGN/V lead from the shift gauge wiring harness. See **Splice Power/Signal Leads**.

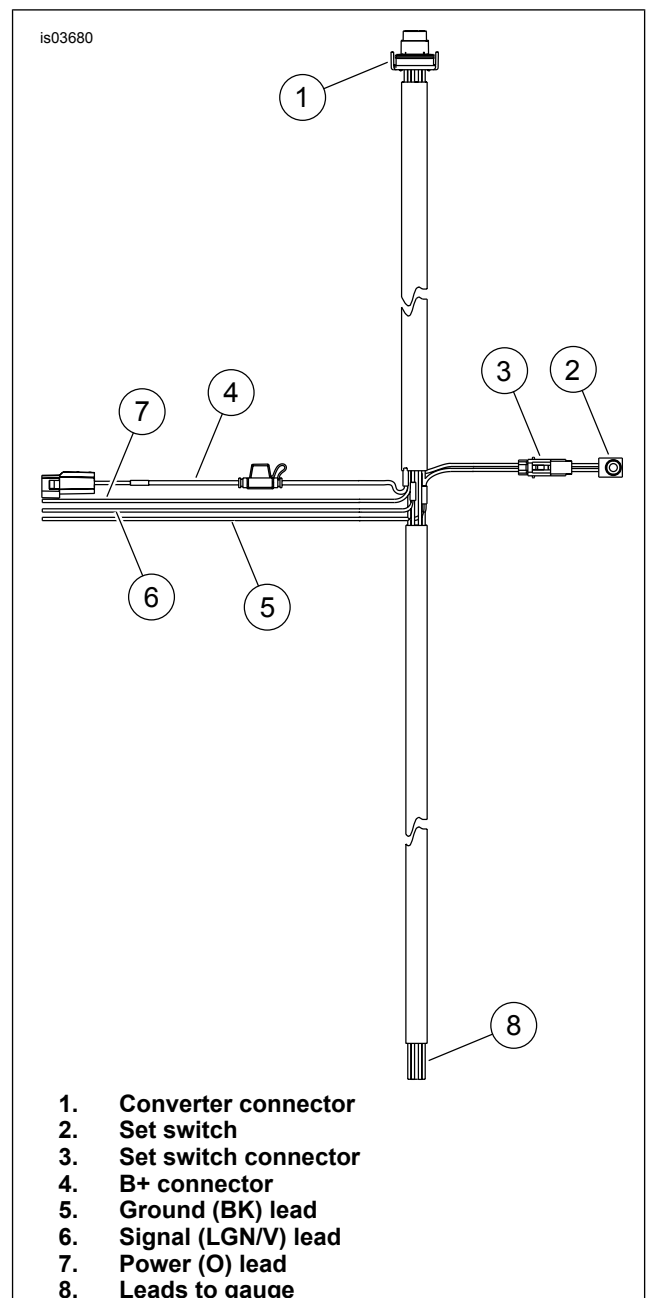
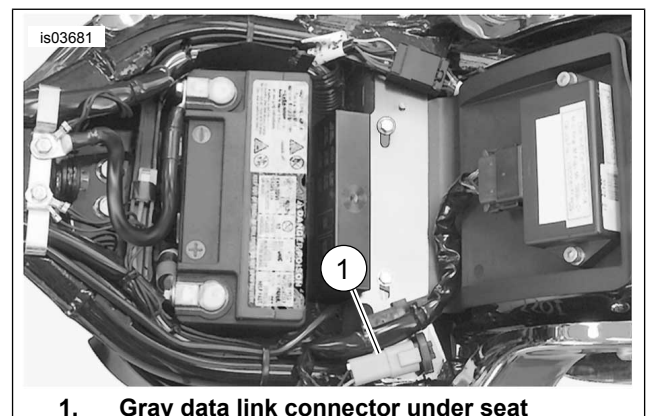


Figure 4. Shift Gauge Wire Harness



1. Gray data link connector under seat

Figure 5. Data Link Connector [91A] (Softail Shown)

Wire the Ground

1. Route the ground lead (BK) to the ground location for the model. **For XL:** See Figure 6. To the ground stud (1) on the engine/transmission case. **For XL:** See Figure 7. On the frame strap (1) under the seat directly in front of the battery (2). **For Dyna:** See Figure 8. At either of the rear ground studs (1) under the fuse block (2). **For FLHR/I:** See Figure 9. Under seat directly in front of battery (1).
2. Determine the length for the ground (BK) lead and cut the lead.
3. Strip 3/8 inch (9.53 mm) of insulation from the lead.
4. Select the ring terminal that fits the ground stud or bolt for the model and crimp the ring terminal on the ground lead (BK). **For XL:** 1/4 inch ring terminal **For Softail:** 1/4 inch ring terminal **For Dyna:** 5/16 inch ring terminal **For FLHR:** 1/4 inch ring terminal
5. Remove the bolt or nut from the ground and install the shift gauge ground.

NOTE

For multiple gauge installation, stack up the ground lead ring terminals on the ground.

Route the Power Lead

1. Route the orange power lead lead underneath and down a rear frame rail to the power location for the model. **For XL:** Locate the rear taillamp connector [7] and identify the power (O/W) lead into the pin half (socket 1). Cut the lead 1 1/2 inch from the pin connector [7A]. **For Softail:** The fuse block under the seat behind the battery will be fitted with an adapter to the fuse socket labeled **P&A IGN** to provide a main harness power lead. **For Dyna:** The fuse block inside the left side cover will be fitted with an adapter to the fuse socket labeled **OPEN** to provide a main harness power lead. **For FLHR:** The fuse block will be fitted with an adapter to the fuse socket labeled **P&A IGN** to provide a main harness orange power lead.
2. Determine the length for the power (O) lead and cut the lead.
3. Strip 3/8 inch (9.53 mm) of insulation from the lead.

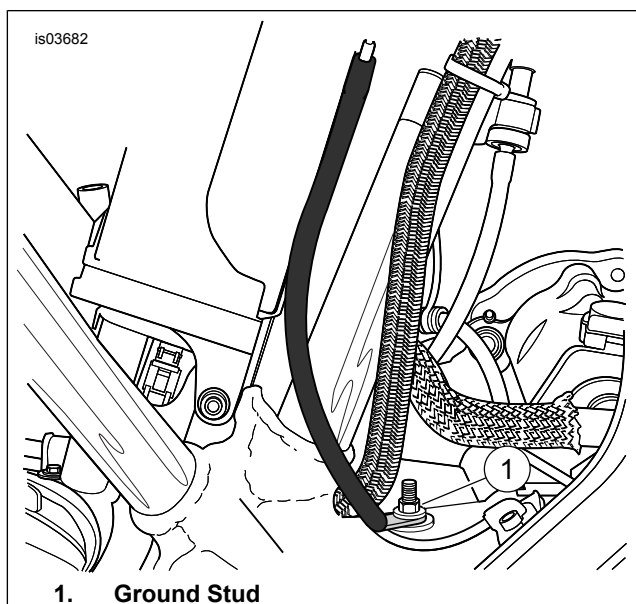


Figure 6. 2004 XL Custom

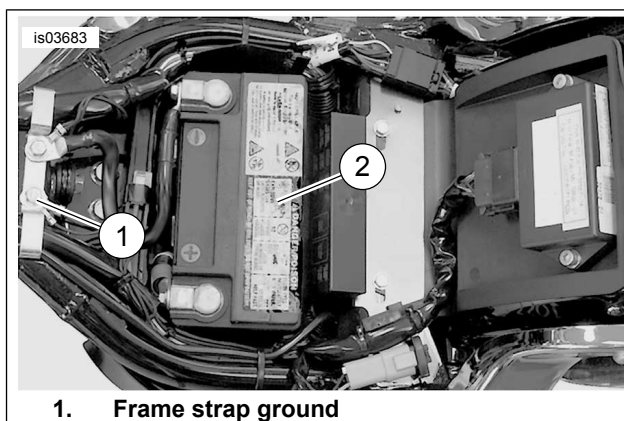


Figure 7. 2004 Softail Ground

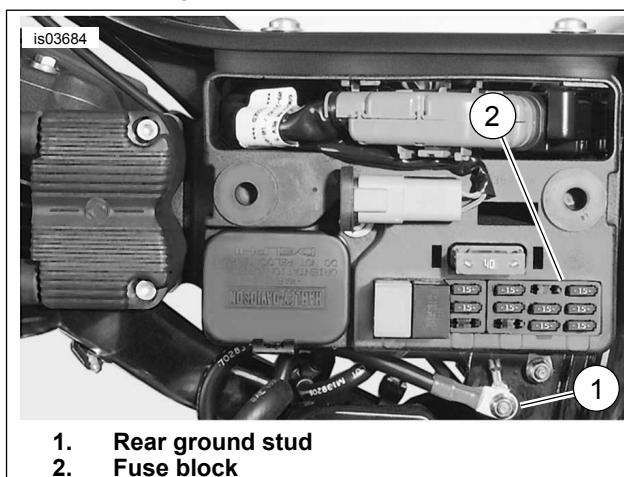


Figure 8. 2004 Dyna Ground

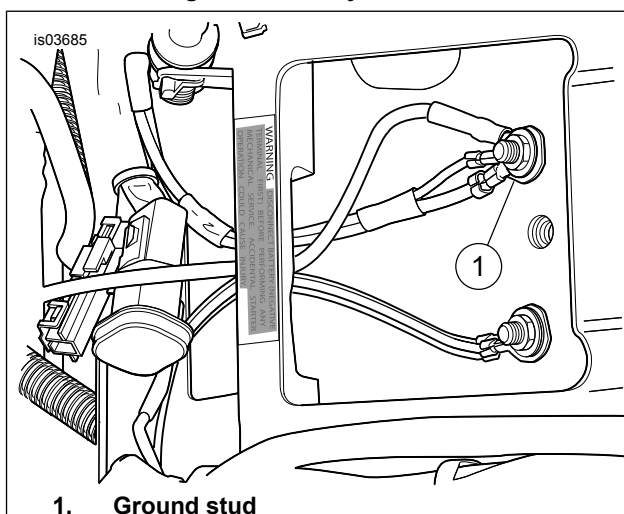


Figure 9. 2004 FLHR Ground

Adapting a Fuse Block to a Power Lead

1. **For all models except XL:** Access the fuse block and remove the fuse block cover.
2. See Figure 10. Select the fuse block adapter from the kit and cut off the end that does **not** fit the **P&A IGN (OPEN)** socket terminal on the back of the fuse block.
3. Install the end of the kit adapter wire into the socket on the back of the fuse block marked as **P&A IGN (OPEN)**.

NOTE

There should be a wire connected to one side of this socket on the back of the fuse block, but no wire exiting the socket and no fuse in the fuse holder on the front of the fuse block.

- See Figure 11. Install a 2-Amp fuse in the **P&A IGN (OPEN)** slot.

Splice Power/Signal Leads

NOTE

The splice connector (Part Number 70586-93) is red for 18-22 gauge wire.

- After determining the length required for the power (O) lead and the signal (LGN/V) lead, cut the the lead as necessary.
- Expose bare wire by stripping 3/8 inch (9.53 mm) insulation from the ends of the leads.
- See Figure 12. Identify the splice configuration required for the power and signal leads for a single shift gauge or in combination with other gauges.
- Insert the leads and crimp the metal insert of the splice.

NOTE

Gently hold the butt splice from the kit in the "red" jaws of the Packard Crimp Tool (HD-38125-18). Feed the stripped lead(s) up to the wire stop inside the metal insert on one half of the connector. Squeeze the tool to crimp the metal insert. The tool automatically opens when finished. Repeat for the other end of the connector to capture one or two stripped leads.

⚠ WARNING

Be sure to follow manufacturer's instructions when using the UltraTorch UT-100 or any other radiant heating device. Failure to follow manufacturer's instructions can cause a fire, which could result in death or serious injury. (00335a)

- Avoid directing the heat toward any fuel system component. Extreme heat can cause fuel ignition/explosion resulting in death or serious injury.
 - Avoid directing heat toward any electrical system component other than the connectors on which heat-shrink work is being performed.
 - Always keep hands away from tool tip area and heat shrink attachment.
- Using the UltraTorch Ut-100 (HD-39969) or other suitable radiant heating device, heat the crimped splice from the center of the crimp out to each end until the sealant exudes out both ends of the connector and the tubing assumes a smooth cylindrical appearance.

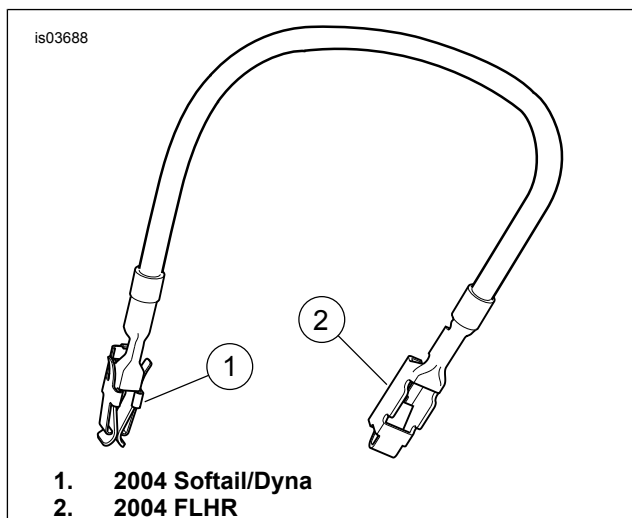
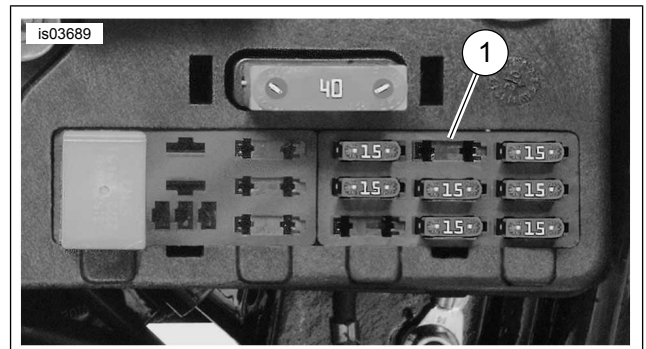
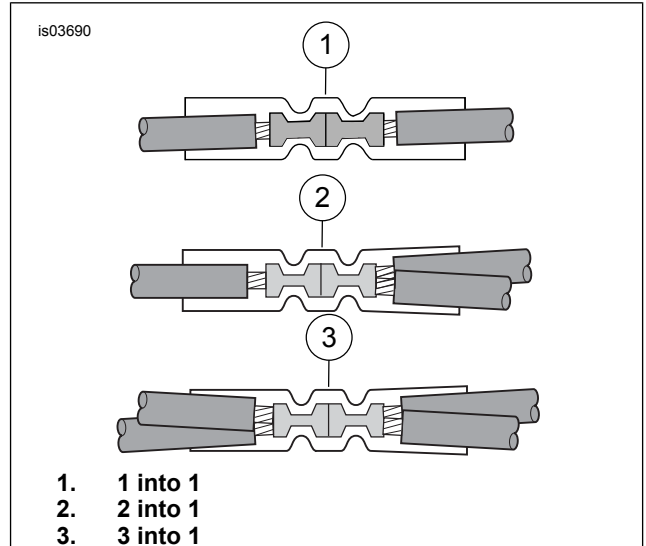


Figure 10. Fuse Block Adapter



1. 2-Amp fuse slot

Figure 11. Socket for 2 Amp Fuse (2004 Dyna Shown)



- 1 into 1
- 2 into 1
- 3 into 1

Figure 12. Splice Configurations

Wire the Harness to the Shift Gauge

NOTE

Before stripping or crimping the ring terminals on to the gauge wire leads, inspect steering clearance, suspension clearance and look for any pinch points along wire path. Turn forks lock to lock as part of inspection.

- See Figure 16. Lubricate the conduit with soap and water and pull the wires and conduit through the housing grommet (6).
- Strip 3/8 inch of wire from the ends of the wire leads.
- Crimp the #6 ring terminals (4) to the leads.
- Thread the standoff from the gauge housing kit into the bottom of the gauge and tighten.

NOTE

At a multiple gauge bracket, the wire conduit for the shift gauge can be identified as the wire conduit with 4 leads.

- See Figure 13. Thread the ring terminated wires (1) and conduit (2) into the gauge housing (3).
- Fit the grommet to the housing.
- See Figure 14. Match wire colors to terminal posts on back of gauge:
 - Orange (power) to positive (+) terminal (2).
 - Black (ground) to negative (-) terminal (3).
 - Yellow (power) to LED (unlabeled) terminal (1).
 - Pink (analog) to signal (S) terminal (4).

8. Install a nut to secure the ring terminal over the posts and nuts on the back of the gauge.
9. Verify that the ring terminals or wires are not grounding against each other.
10. Push the gauge housing into the isolation gasket and install the flat head screw from the gauge housing kit.
11. Tighten the flat head screw to snug the housing up against the gasket.
12. Inspect the seal of isolation gasket around the perimeter of the housing.

Inspect Wiring

1. With the wire harness along frame and to the gauge, bounce motorcycle to look for pinch points between suspension components and gauge wires.
2. Cable wrap the gauge harness wires together at the back of the gauge housings.
3. To look for pinch points in the steering, turn front forks lock to lock.
4. Verify absence of pinch points or clearance from heat sources along wiring harness.
5. Bundle the harness to the main wiring harness and any additional gauge harness along frame backbone by using cable straps to support wires so they do not chafe or contact hot or moving points.

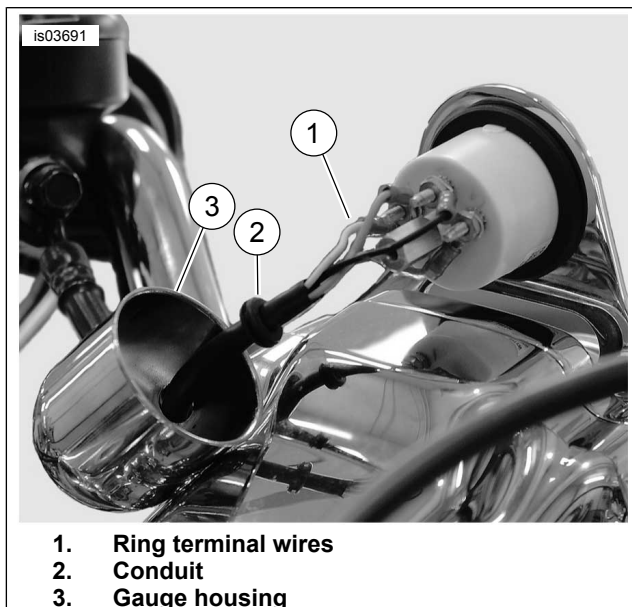


Figure 13. Gauge Wiring (XL Custom Shown)

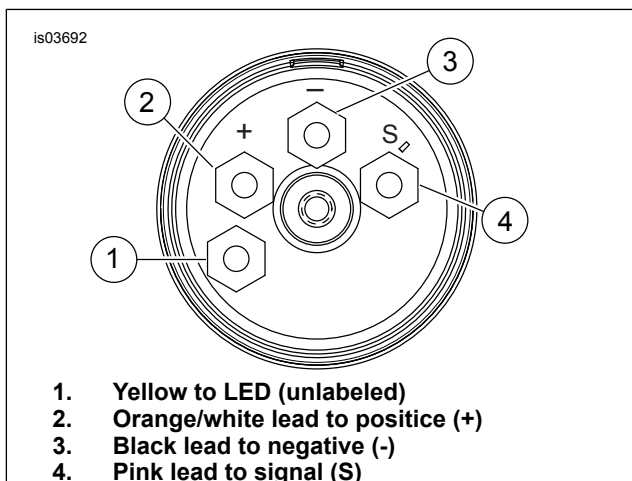


Figure 14. Gauge Terminals

Return the Motorcycle to Service

1. **For models except XL:** Install the fuse block.
2. Follow the instructions in the Service Manual to replace fuel tank, attach fuel line or fittings and add fuel.
3. Connect the negative (-) battery cable to the battery.

⚠ WARNING

After installing seat, pull upward on seat to be sure it is locked in position. While riding, a loose seat can shift causing loss of control, which could result in death or serious injury. (00070b)

4. Install the seat and side covers.

Setting the Shift Point

1. Depending on riding style and model, select an RPM shift point for your motorcycle.

NOTE

Once set, the light on the face of the gauge will indicate the same RPM shift point regardless of the gear selected.

2. Turn the IGNITION switch to ON.
3. See Figure 15. Watch the shift gauge and press and hold the set switch.
4. The needle will automatically sweep from the 0 mark (1) on the scale (2000 RPM) to the S mark (3) (8000 RPM) and back as long as the set switch is held in.
5. As the needle reaches the selected RPM as indicated between 2000 and 8000, release the set switch.

NOTE

The mark 1/2 way (2) between the 0 and the S indicates 5000 RPM.

6. The RPM set point can be further adjusted in 200 RPM increments by "clicking" the set switch. If the needle was **ascending** when the set switch was initially released, 1 click will add 200 RPM to the shift point. If the needle was **descending** when the set switch was initially released, 1 click will subtract 200 RPM.

NOTE

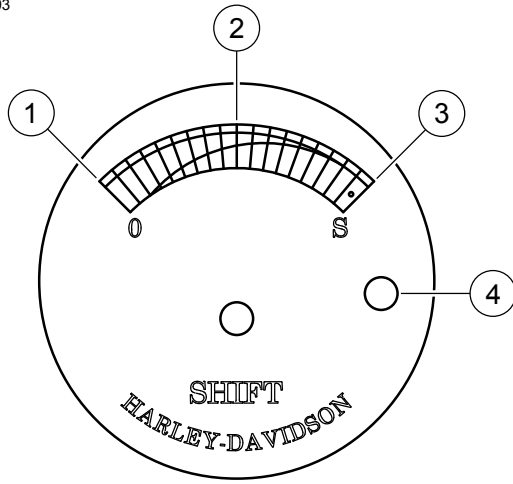
See Figure 15. When the switch is inactive for longer than 5 seconds, the gauge recognizes the last setting as the final RPM set point. The indicator light (4) will then flash 4 times to indicate that the shift point RPM has been set.

7. Separate the connector to remove the set switch. Store the set switch for future RPM set point adjustments.
8. Cable tie the set switch connector to the main wire harness under the seat.

NOTE

To reduce the accumulation of debris in open connectors, cable tie the gauge harness with the open connectors pointed down.

is03693



- 1. 0 (zero) mark (2000 RPM)
- 2. 1/2 mark (5000 RPM)
- 3. S (shift) point (8000 RPM)
- 4. Indicator light

Figure 15. Shift Gauge Face

Riding/Operation

When riding, the RPM set point becomes the S mark on the scale. As engine speed increases, the needle sweeps toward the S mark. When the RPM reaches the set point (and the needle reaches the S), the indicator light illuminates for 5 seconds.

Regardless of the gear selected, as the engine RPM drops below the set point and then revs again sweeping the needle to the S mark, the indicator light will illuminate for 5 seconds.

SERVICE PARTS

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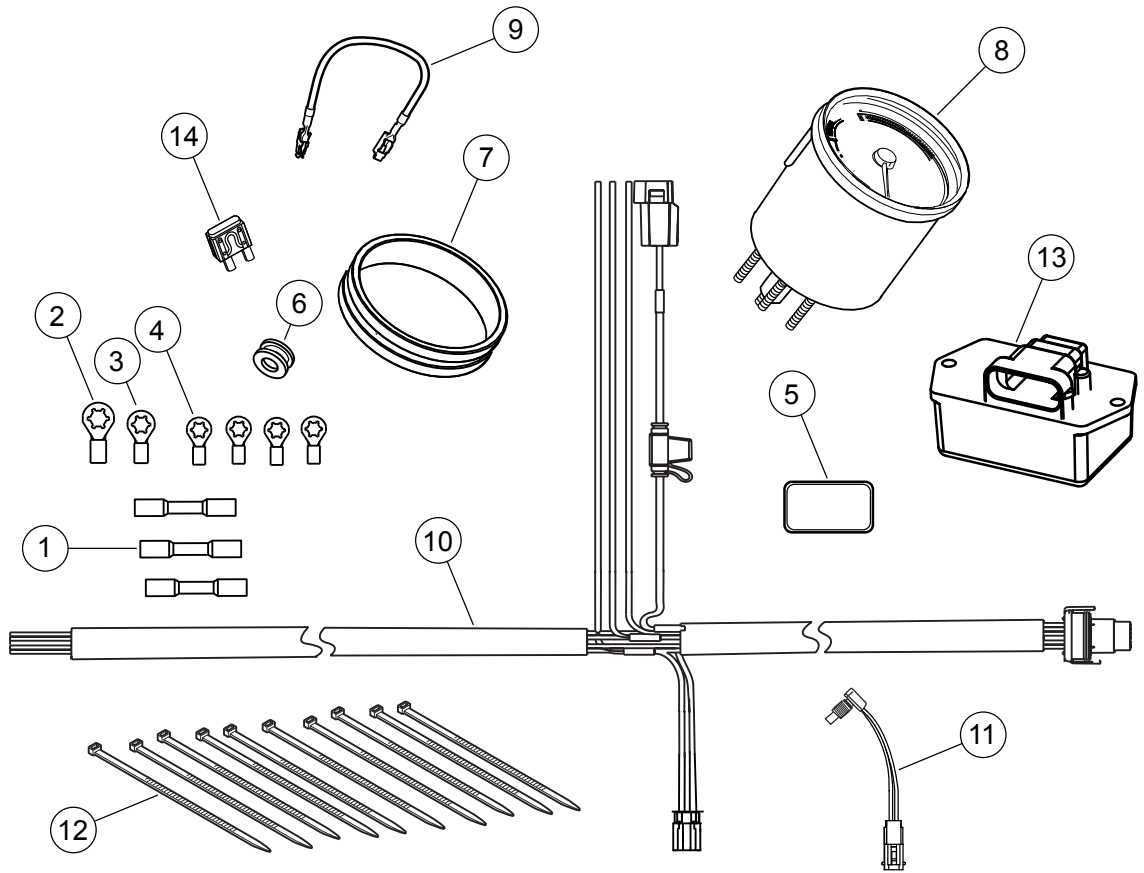


Figure 16. Service Parts: One and One-Half Inch Shift Gauge

Table 1. Service Parts Table: 1.5 inch Shift Gauge

Item	Description (Quantity)	Part Number	Item	Description (Quantity)	Part Number
1	Butt splice, 14-16 gauge (3)	70586-93	8	Shift gauge	75116-04
2	Ring terminal, 5/16 inch	9859	9	Fuse block adapter	70329-04
3	Ring terminal, 1/4 inch	9858	10	Wiring harness	70261-04
4	Ring terminal, #6 (4)	9856	11	Set switch assembly harness	70352-04
5	Foam retainer	91086-01	12	Cable strap (10)	10006
6	Grommet	11431	13	Converter box, digital to analog	72358-04
7	Isolation gasket	75260-04	14	Fuse, 2-amp (2)	54305-98