



SMART TUNE PRO AUTOMATIC TUNING MODULE (ATM) KIT

J006508

2016-10-13

GENERAL

Kit Number

41000445

Models

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

Installation Requirements

- Separate purchase of Exhaust Oxygen Sensor (Wide Band HO₂) Bung Drill And Tap Tool Kit (Part No. 14900105) may be required for this installation.
- Separate purchase of Screamin' Eagle® Pro Street Tuner (Part No. 41000008C) is required for this installation.
- Screamin' Eagle® Tuner Cable Kit (Part No. 41000018) is required for this installation.
- **2014-2016 Touring models:** Separate purchase of Screamin' Eagle® High-Flow Exhaust System with Street Cannon Mufflers (Part No. 64800043 or 64800044) is required for this installation.
- **Dyna and Softail models:** Separate purchase of Wide Band O₂ Sensor Wire Harness Extension Kit (Part No. 69201704) is required for this installation.
- **2016-2017 Dyna® Low Rider S (FXDLS) model:** Separate purchase of Harley Davidson Head Pipe Assembly (Part No. 64884-09A) is required for this installation.
- **2016-2017 Softail® models:** Separate purchase of Harley Davidson Head Pipe Assembly is required for this installation. [Refer to Table 1.](#)

Table 1. Softail Head Pipe

MODEL	HARLEY DAVIDSON PART NO.
FLSTF, FLSTFB, FLSTFBS	66779-07A
FLS, FLSS, FLSTN	65300-07A
FLSTC	66780-07, 66781-07
FXSB	66780-07, 66795-09

WARNING

The rider's safety depends 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. (00333a)

NOTE

This instruction sheet references service manual information. A service manual for this year/model motorcycle is required for this installation. One is available from a Harley-Davidson dealer.

The Product Information Label contained in this kit is a requirement of the California Air Resource Board (CARB) emission regulation for all 2014 and later Touring models, 2016 and later Softail models, and 2016 and Later Dyna FXDLS models. Place the label on the right side of the frame directly beneath the VIN sticker. This label is not required outside the state of California.

Recalibrate ECM

NOTICE

You must recalibrate the ECM when installing this kit. Failure to properly recalibrate the ECM can result in severe engine damage. (00399b)

Kit Contents

See **Figure 30** and **Refer to Table 2**.

WARNING

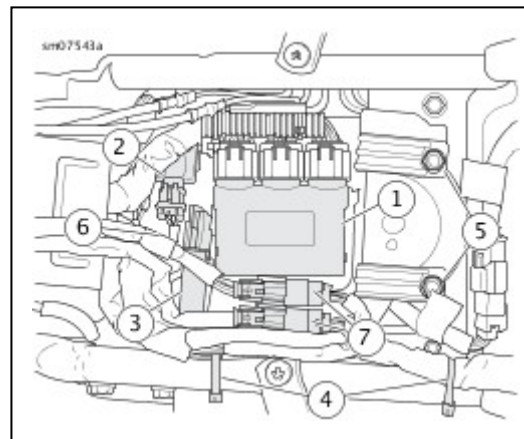
The rider's safety depends upon the correct installation of this kit. If the procedure is not within your capabilities or you do not have the correct tools, have a Harley-Davidson dealer perform the installation. Improper installation of this kit could result in death or serious injury. (00308a)

INSTALLATION

Touring Wide Band HO2 Sensors

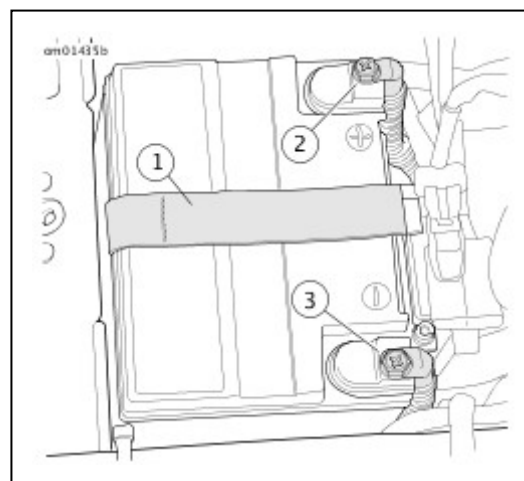
1. See service manual. Remove saddlebags.
2. See service manual. Remove main fuse.
3. See service manual. Remove seat.
4. Remove battery:
 - a. See **Figure 1**. Release ECM (1) from top caddy. Move out of the way.
 - b. If present, move purge solenoid (2) forward to release from top caddy.
 - c. **Models with security system:** Release HFSSM antenna (3) from top caddy and move out of the way.
 - d. Release connectors (7) from anchors on top caddy.
 - e. Remove fasteners (5).
 - f. Cut cable straps (4). Move harnesses to allow more clearance for the top caddy.
 - g. Push top caddy forward to disengage front of caddy from front hold-down bracket. Lift and remove top caddy.

- h. See **Figure 2**. Disconnect both battery cables, negative cable first.
- i. Pull up battery strap to raise battery. When battery is extracted far enough to get a good grip, grasp battery and remove completely.



1. ECM.
2. Purge solenoid.
3. HFSM antenna.
4. Cable straps.
5. Screws (2).
6. Hold-down (not visible).
7. Connectors (2).

Figure 1. Top Caddy



1. Lifting strap.
2. Positive terminal.
3. Negative terminal.

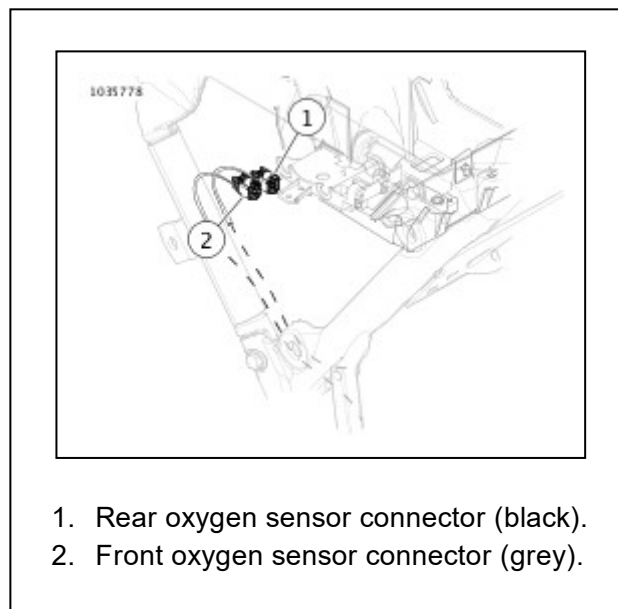
Figure 2. Battery Compartment

5. See service manual. Remove right front footboard and brackets from frame.

6. **NOTE**

Note routing of oxygen sensor harness and placement of cable straps along the frame.

See **Figure 3**. Disconnect front (2) and rear (1) heated oxygen sensor (HO2) connectors.



1. Rear oxygen sensor connector (black).
2. Front oxygen sensor connector (grey).

Figure 3. Front and Rear Oxygen Sensor Location

7. See service manual. Remove exhaust system.

8. **Exhaust pipe:**

- a. **2014-2016 models:** Prepare Screamin Eagle® High-Flow Exhaust System with Street Cannon Mufflers for HO₂ sensor installation.

NOTE

No rework will be required on Screamin Eagle® High-Flow Exhaust System. Bungs accept wide band HO₂ sensors.

- b. **2017-later models:** Rework exhaust pipe. Use Exhaust Oxygen Sensor (Wide Band HO₂) Bung Drill And Tap Tool Kit (Part No. 14900105) to complete procedure.

9. **NOTE**

- Do not install sensors that have been dropped or impacted by other components. The sensing element may be damaged.
- Replacement sensor assemblies have threads coated with anti-seize lubricant and a new gasket.
- The electrical connector must be clean and free of any dielectric grease.

See **Figure 4** and **Figure 30**. Install wide band heated oxygen sensors (2). Using Oxygen Sensor Socket (Part No. HD-48262-A) tighten to:

Torque: 40–60 N·m (29–44 ft-lbs)

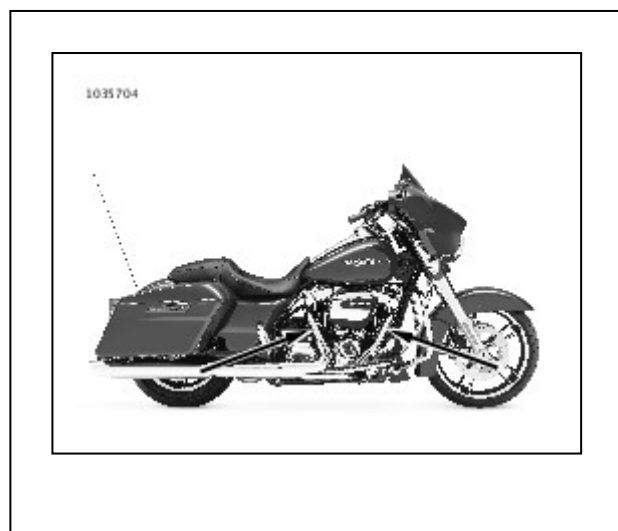


Figure 4. Oxygen Sensor Locations (Inboard Side of Exhaust Pipes)

10. **NOTE**

It is acceptable for the wide band sensor strain guide to make contact with the tranny cover.

If there is contact between the O2 sensor body and transmission cover, install a couple of washers or a spacer under the mid-frame exhaust clamp. Up to 0.200 in of spacer is acceptable.

See service manual. Install exhaust system with new exhaust gaskets.

11. **NOTE**

ATM has four leads and a ground wire.

See **Figure 5**. With the ATM inside the battery box, route grey and black connector harnesses:

- Start at front right corner of battery box area.
- Slide grey or black connector harness (1) between the brake lines (2) and frame rail (3).
- Slide connector harness along until it exits the battery box area and enters side cover area.
- Repeat procedure for other connector harness.

12. See **Figure 6** and **Figure 9**. Route the grey (3) and black (1) connector harness leads out behind the ABS control module (2) and connect to main harness. Color match connectors: black to black and grey to grey.

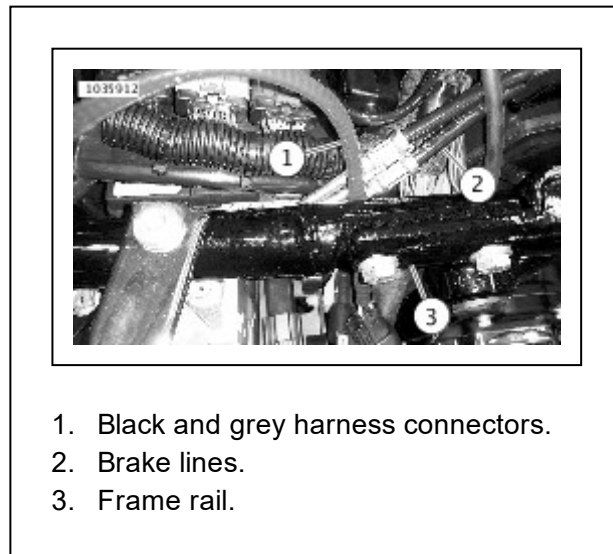


Figure 5. Grey and Black Connector Harness Routing

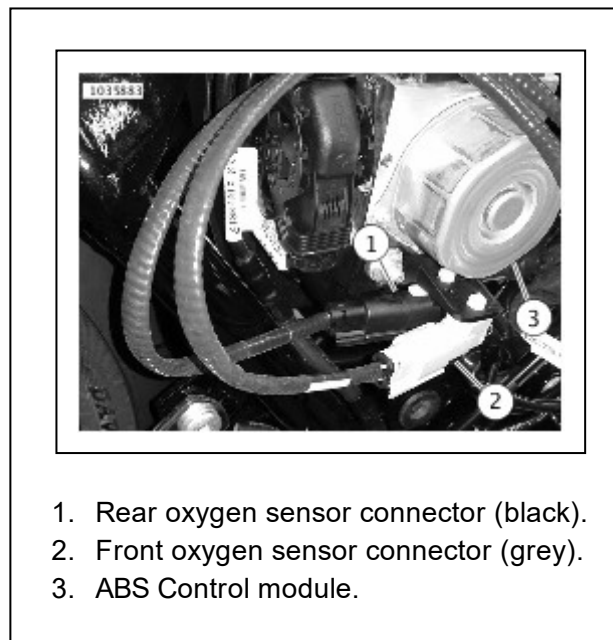


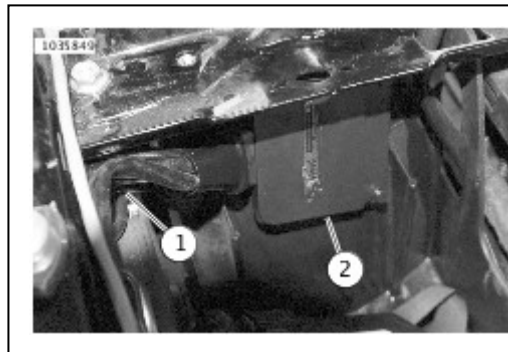
Figure 6. ATM Main Harness Connections

13. See **Figure 7**. Clean mounting surface with alcohol pad. Remove liner from adhesive backing and install dual lock tape to ATM. Remove liner from adhesive backing of dual lock tape and install ATM (1) to back of battery compartment.

14. **NOTE**

Install cable straps as needed to secure harness. Make sure harness leads will not interfere when battery and top caddy are installed.

Install ATM with wire harness (2) facing right toward the inboard side of the frame.



1. ATM Mounting location.
2. ATM with harness.

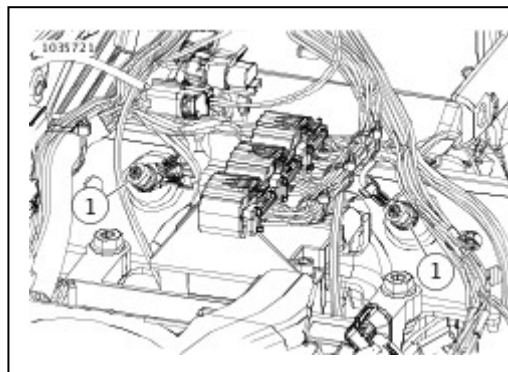
Figure 7. ATM Mounting Location

15. **NOTE**

Ground posts are located on right and left in front of battery compartment.

See **Figure 8**. Route and connect ATM ground wire to ground post (1). Tighten to:

Torque: 6–10 N·m (50–90 **in-lbs**)



1. Ground posts.

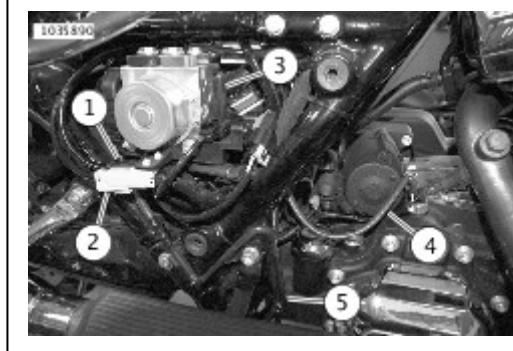
Figure 8. Battery Box Ground Post Locations

16. See **Figure 9. Front HO2 sensor (5, long harness lead):**

- a. From front sensor, route and secure O2 harness along the inboard side of the right frame downpipe. Install cable straps as needed.
- b. Route and secure harness along inboard side of the lower frame toward the O2 sensor connector. Install cable straps as needed or use existing clamps and retainers.
- c. Connect O2 sensor connectors.

17. **Rear HO2 sensor (4, short harness lead):**

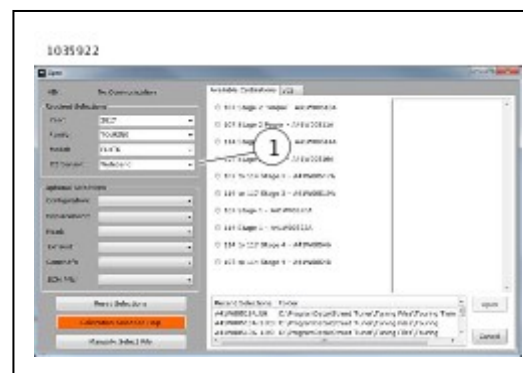
- a. From rear sensor, route and secure O2 harness along top of transmission (4). Install cable straps as needed.
- b. From battery box area, route and secure ATM harness toward the O2 sensor connector. Secure with cable straps as needed.
- c. Connect O2 sensor connectors.



1. Rear oxygen sensor connector (black).
2. Front oxygen sensor connector (grey).
3. ABS Control module.
4. Rear O2 Sensor Harness Routing.
5. Front O2 Sensor Harness Routing.

Figure 9. ATM Sensor Harness Routing

18. Make sure all harnesses and connectors are secured and not located in any hot zones.
19. See service manual. Install right front footboard and brackets to frame.
20. See service manual. Install battery, battery caddy and attach ECM.
21. See service manual. Install seat. After installing seat, pull up on the seat to verify that it is secure.
22. See service manual. Install main fuse.
23. See service manual. Install saddlebags.
24. See **Figure 10**. Use Screamin' Eagle Pro Street Tuner to complete installation. Download new ECM calibration when installing this kit. When selecting a calibration to download with the Screamin' Eagle Pro Street Tuner, select Wideband (1) from the pull down menu for the O2 Sensor option. Refer to the Screamin' Eagle Pro catalog or contact a Harley-Davidson dealer for Screamin' Eagle Pro Street Tuner details.



1. Wideband O2 sensor selection.

Figure 10. Wideband O2 Sensor Selection

Softail® Wide Band HO2 Sensors

1. See service manual. Remove main fuse.
2. See service manual. Remove seat.
3. See service manual. Remove battery.
4. See **Figure 11**. See service manual. Remove battery caddy.

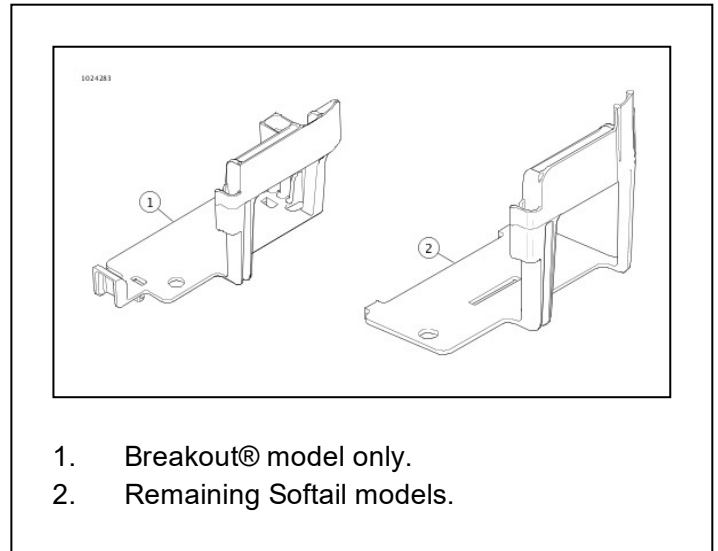


Figure 11. Non-Modified Softail Battery Caddy

5. NOTE

Battery caddy **must be** modified to hold ATM. Do not cut completely through stiffening ribs. Cut only designated areas as instructed. Cutting more than required will lose structural integrity of battery caddy.

A die grinder with a cutting wheel is recommended.

See **Figure 12**, **Figure 13**, and **Figure 14**. Cut-off stiffening ribs (1 and 2) of caddy.

- a. Position ATM module within battery caddy.
- b. Mark outline of ATM harness on front. Also mark the depth on adjacent rib.

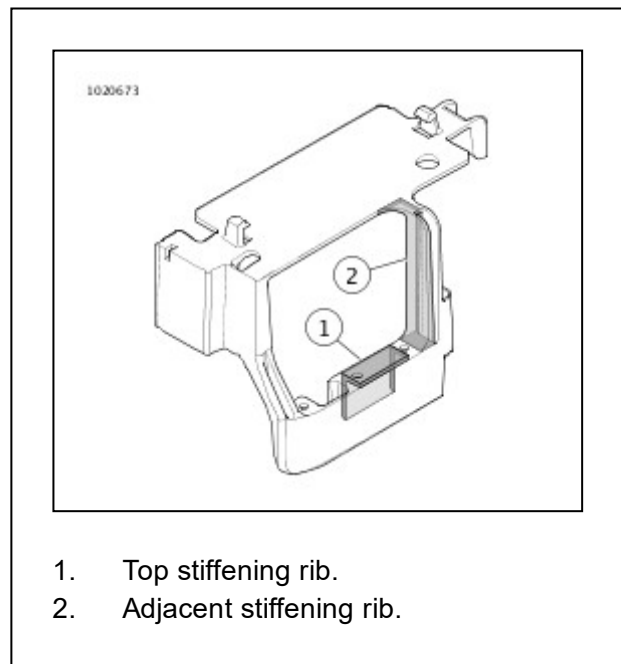


Figure 12. Areas Highlighted To Be Cut Away

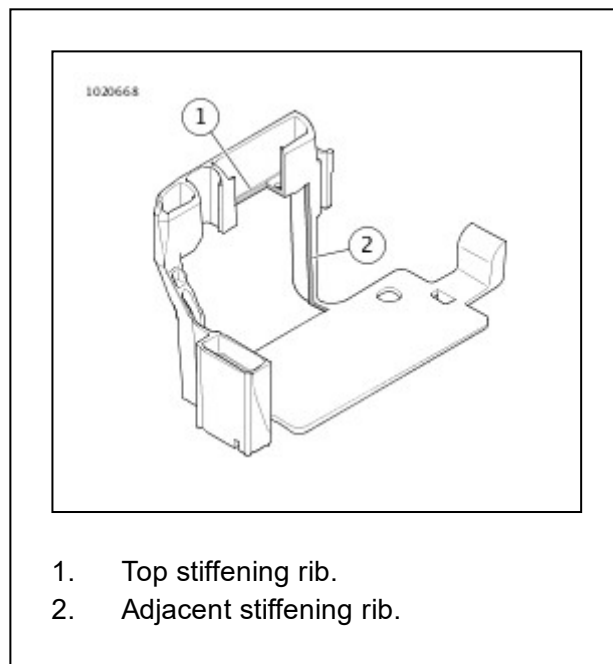


Figure 13. Front of Caddy Cut Away

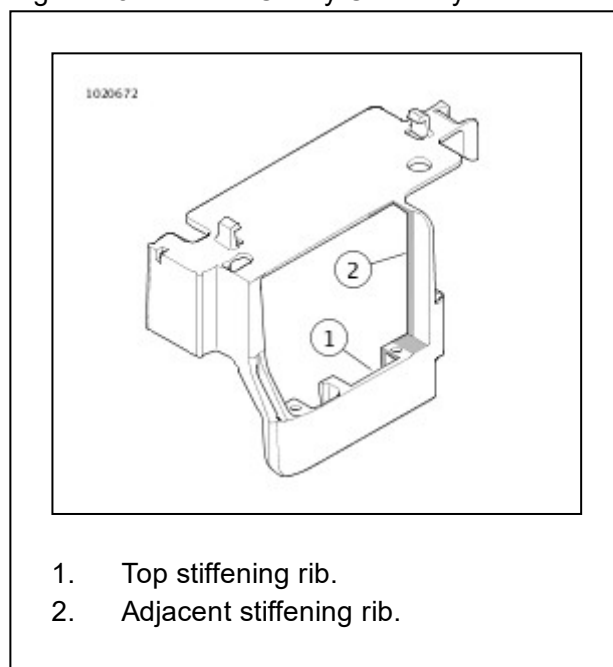
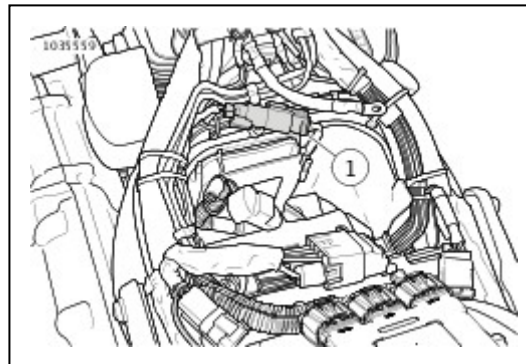


Figure 14. Back of Caddy Cut Away

6. **NOTE**

Note routing of oxygen sensor harness and placement of cable straps along the frame.

See **Figure 15**. Disconnect rear (1) heated oxygen sensor (HO2) connectors from main harness.



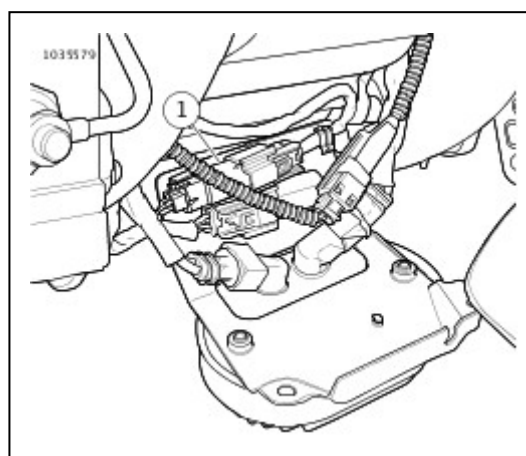
1. Rear Oxygen Sensor Connector.

Figure 15. Rear Oxygen Sensor Location

7. **NOTE**

Note routing of oxygen sensor harness and placement of cable straps along the frame.

See **Figure 16**. Open front voltage regulator cover and disconnect front O2 sensor connector (1). Remove connector housing from caddy.



1. Front Oxygen Sensor Connector.

Figure 16. Front Oxygen Sensor Location

8. See service manual. Remove exhaust pipe.

9. **NOTE**

- Do not install sensors that have been dropped or impacted by other components. The sensing element may be damaged.
- Replacement sensor assemblies have threads coated with anti-seize lubricant and a new gasket.
- The electrical connector must be clean and free of any dielectric grease.

See **Figure 17**, **Figure 30** and **Refer to Table 1**. Install wide band heated oxygen sensors (2). Using Oxygen Sensor Socket (Part No. HD-48262-A) tighten to:
Torque: 40–60 N·m (29–44 ft-lbs)



Figure 17. Oxygen Sensor Locations (Inboard Side of Exhaust Pipes)

10. See service manual. Install exhaust pipe with new exhaust gaskets.
11. Install battery caddy with ATM. Adjust and reposition as needed.

12. **NOTE**

Ground post is located in front of battery compartment.

See **Figure 18**. Connect ATM ground wire to ground post. Tighten to:

Torque: 6–10 N·m (50–90 **in-lbs**)

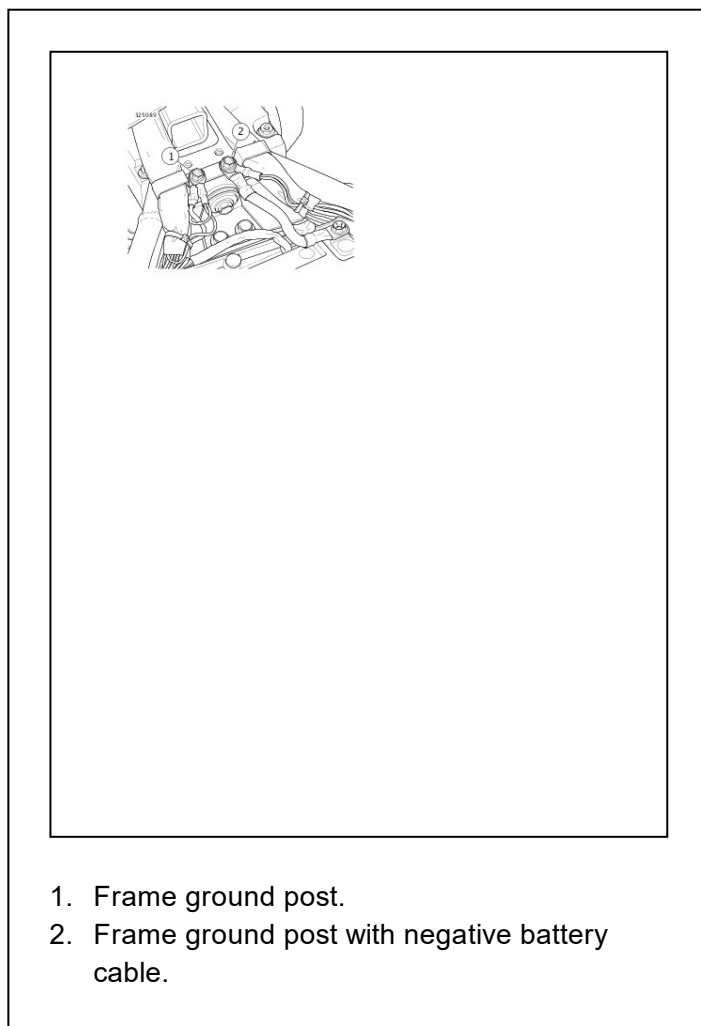


Figure 18. Battery Box Ground Post Locations

13. Connect Wide Band O2 Sensor Wire Harness Extension Kit (Part No. 69201704) to ATM harness assembly. Color match connectors: grey to grey.
14. See **Figure 19**. Route grey harness connector out of battery compartment:
 - a. Locate main harness (3).
 - b. Route harness with grey connector along main harness (2) toward the front main harness connector.
 - c. Color match connectors (1): grey to grey.
- 14.4. Secure harness to inboard side of the main harness with cable straps as needed.

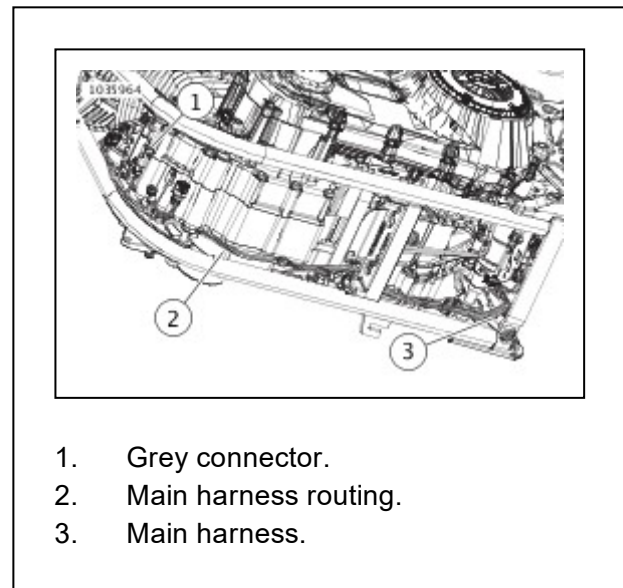


Figure 19. Harness Routing

15. NOTE

Make sure harness leads will not interfere when battery and caddy are installed.

See **Figure 15**. Route black harness connector to main harness. Color match connectors: black to black.

16. See Figure 20. Front HO2 sensor (long harness lead):

- Route harness connector out of battery compartment.
- Locate main harness (2).
- Route harness along main harness (1) toward the front O2 sensor connector.
- Connect sensor connectors.

16.5. Secure harness to inboard side of main harness with cable straps as needed.

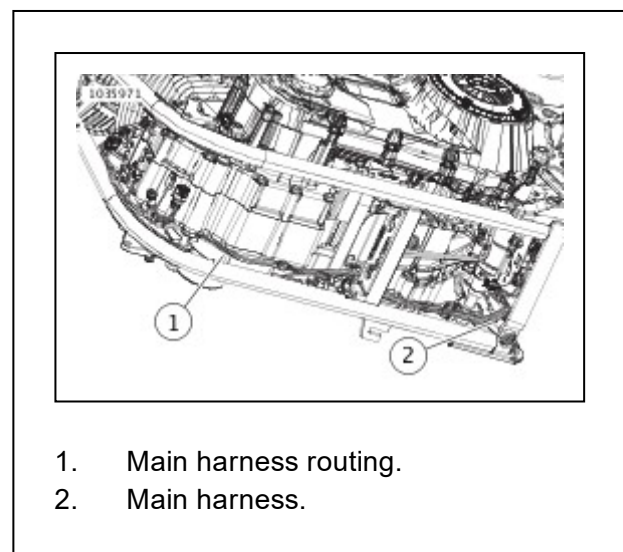


Figure 20. Harness Routing

17. Rear HO2 sensor (short harness lead):

- Route harness along top of transmission to neutral switch area.

- b. Connect sensor connectors.
 - c. Secure harness with cable straps as needed.
18. Make sure all harnesses and connectors are secured and not located in any hot zones.
 19. See service manual. Install battery.
 20. See service manual. Install seat. After installing seat, pull up on the seat to verify that it is secure.
 21. See service manual. Install main fuse.
 22. See **Figure 21**. Use Screamin' Eagle Pro Street Tuner to complete installation. Download new ECM calibration when installing this kit. When selecting a calibration to download with the Screamin' Eagle Pro Street Tuner, select Wideband (1) from the pull down menu for the O2 Sensor option. Refer to the Screamin' Eagle Pro catalog or contact a Harley-Davidson dealer for Screamin' Eagle Pro Street Tuner details.

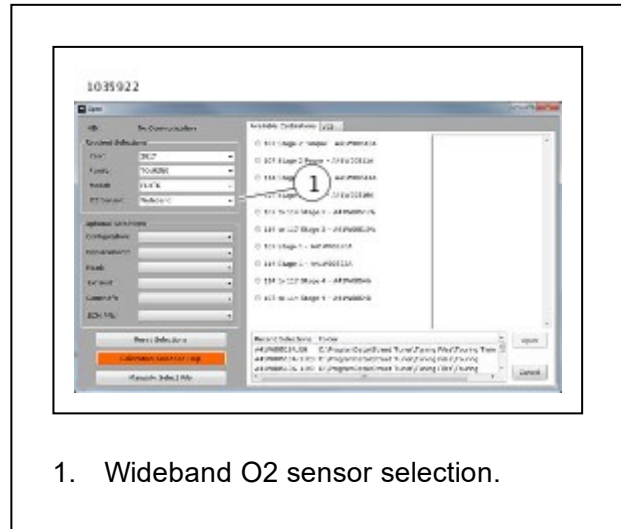


Figure 21. Wideband O2 Sensor Selection

Dyna® Wide Band HO2 Sensors

1. See service manual. Remove main fuse.
2. See service manual. Remove seat.
3. See service manual. Remove battery and battery box.
4. **NOTE**

Note routing of oxygen sensor harness and placement of cable straps along the frame.

See **Figure 22**. Disconnect rear (1) heated oxygen sensor (HO2) connectors from main harness.

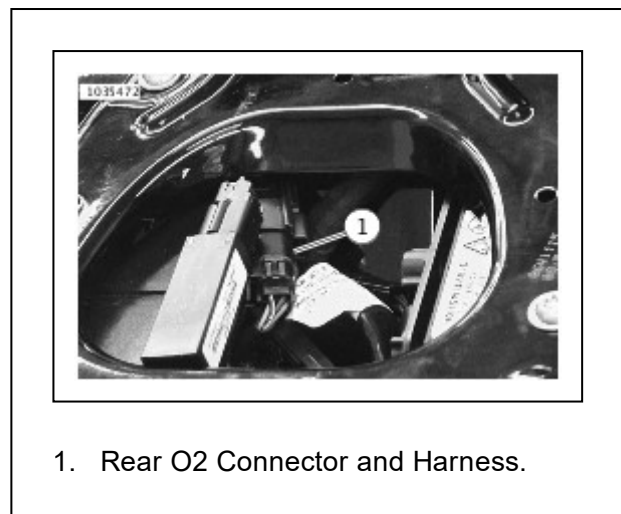
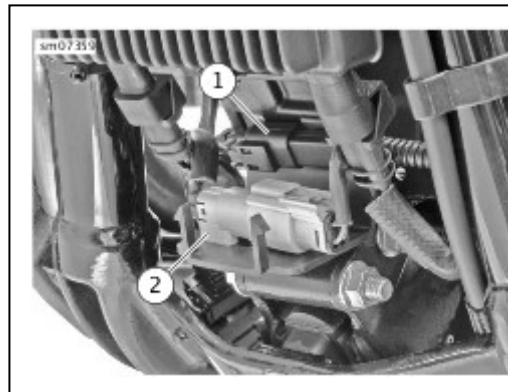


Figure 22. Rear HO2 Sensor Location

5. **NOTE**
- Note routing of oxygen sensor harness and placement of cable straps along the frame.

See **Figure 23**. Open front electrical caddy cover and disconnect front O2 sensor connector (2). Remove connector housing from caddy.



1. CKP Connector.
2. Front O2 Connector and Harness.

Figure 23. Front HO2 Sensor Location

6. See service manual. Remove exhaust pipe.

7. **NOTE**

- Do not install sensors that have been dropped or impacted by other components. The sensing element may be damaged.
- Replacement sensor assemblies have threads coated with anti-seize lubricant and a new gasket.
- The electrical connector must be clean and free of any dielectric grease.

See **Figure 24** and **Figure 30**. In exhaust header part no. 64884-09A, install wide band heated oxygen sensors (2). Using Oxygen Sensor Socket (Part No. HD-48262-A) tighten to:

Torque: 40–60 N·m (29–44 ft-lbs)



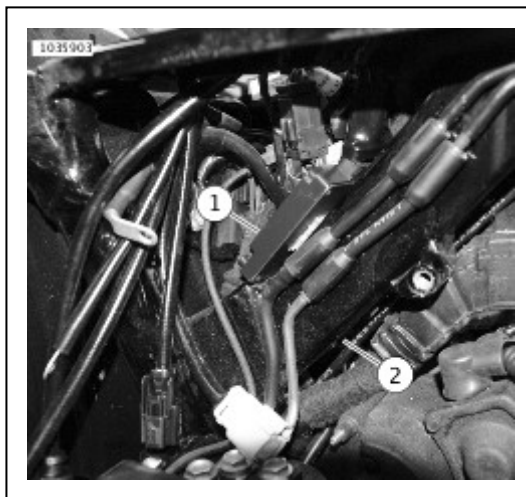
Figure 24. Oxygen Sensor Locations (Inboard Side of Exhaust Pipes)

8. See service manual. Install exhaust pipe(s) with new exhaust gaskets.

9. **NOTE**

ATM has four leads and ground wire. Install ATM with wire harness facing up the backbone of the frame.

See **Figure 25**. Clean mounting surface with alcohol pad. Remove liner from adhesive backing and install dual lock tape to ATM. Remove liner from adhesive backing of dual lock tape and install ATM to backbone of frame.



1. ATM Mounting location.
2. Backbone of frame.

Figure 25. ATM Mounting Location

10. NOTE

Ground post is located under the seating area, on right and in upper rear of battery compartment.

Make sure harness will not interfere when battery and caddy are installed.

See **Figure 26**. Route and connect ATM ground wire to ground post. Tighten to:

Torque: 6–10 N·m (50–90 **in-lbs**)

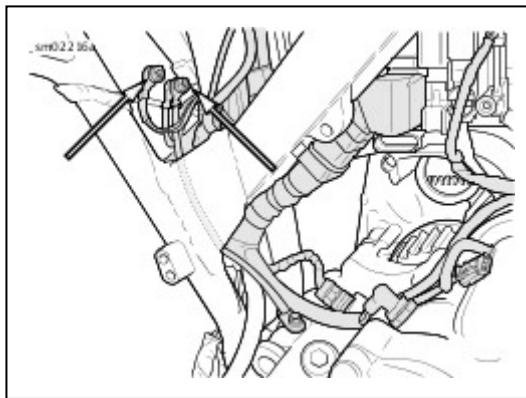
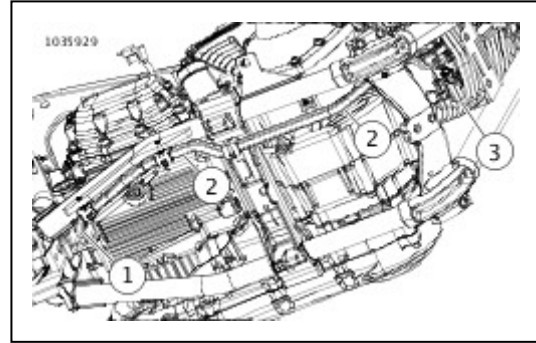


Figure 26. Battery Box Ground Post Locations

11. Connect Wide Band O2 Sensor Wire Harness Extension Kit (Part No. 69201704) to ATM harness assembly. Color match connectors: grey to grey.
12. See **Figure 27**. Route grey harness connector out of the back battery compartment:
 - a. Locate main harness (1) leading to harness caddy (2).
 - b. Route harness with grey connector along main harness caddy toward the front main harness connector.
 - c. Color match connectors (3): grey to grey.
- 12.4. Secure harness to inboard side of harness caddy (2) with cable straps as needed.



1. Main harness.
2. Harness caddy.
3. Grey connector.

Figure 27. Harness Caddy

13. **NOTE**

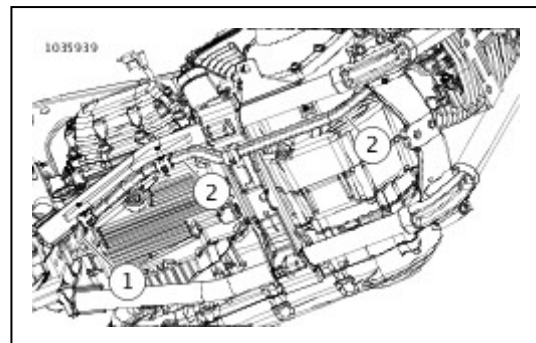
Make sure harness leads will not interfere when battery and caddy are installed.

See **Figure 22**. Route black harness connector to main harness. Color match connectors: black to black.

14. See **Figure 28. Front HO2 sensor (long harness lead):**

- a. Route harness connector out of the back battery compartment.
- b. Locate main harness (1) leading to harness caddy (2).
- c. Route harness along main harness caddy (2) toward the front O2 sensor connector.
- d. Connect sensor connectors.

14.5. Secure harness to inboard side of harness caddy (2) with cable straps as needed.



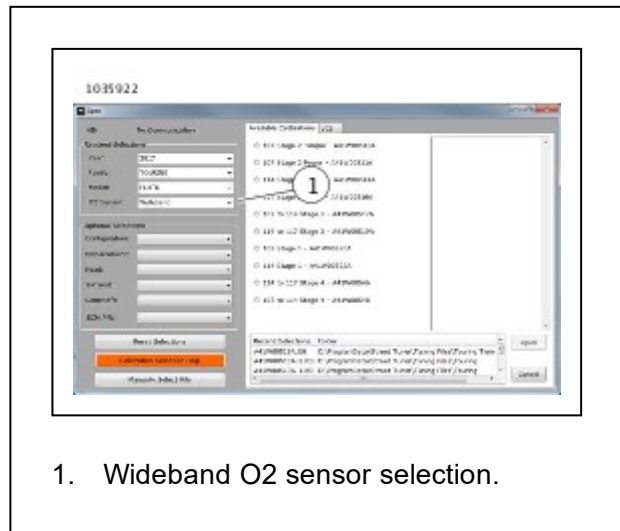
1. Main harness.
2. Harness caddy.

Figure 28. Harness Caddy

15. **Rear HO2 sensor (short harness lead):**

- a. Route harness along top of transmission to neutral switch area.

- b. Connect sensor connectors.
 - c. Secure harness with cable straps as needed.
16. Make sure all harnesses and connectors are secured and not located in any hot zones.
 17. See service manual. Install battery caddy and battery.
 18. See service manual. Install seat. After installing seat, pull up on the seat to verify that it is secure.
 19. See service manual. Install main fuse.
 20. See **Figure 29**. Use Screamin' Eagle Pro Street Tuner to complete installation. Download new ECM calibration when installing this kit. When selecting a calibration to download with the Screamin' Eagle Pro Street Tuner, select Wideband (1) from the pull down menu for the O2 Sensor option. Refer to the Screamin' Eagle Pro catalog or contact a Harley-Davidson dealer for Screamin Eagle Pro Street Tuner details.



1. Wideband O2 sensor selection.

Figure 29. Wideband O2 Sensor Selection

SERVICE PARTS

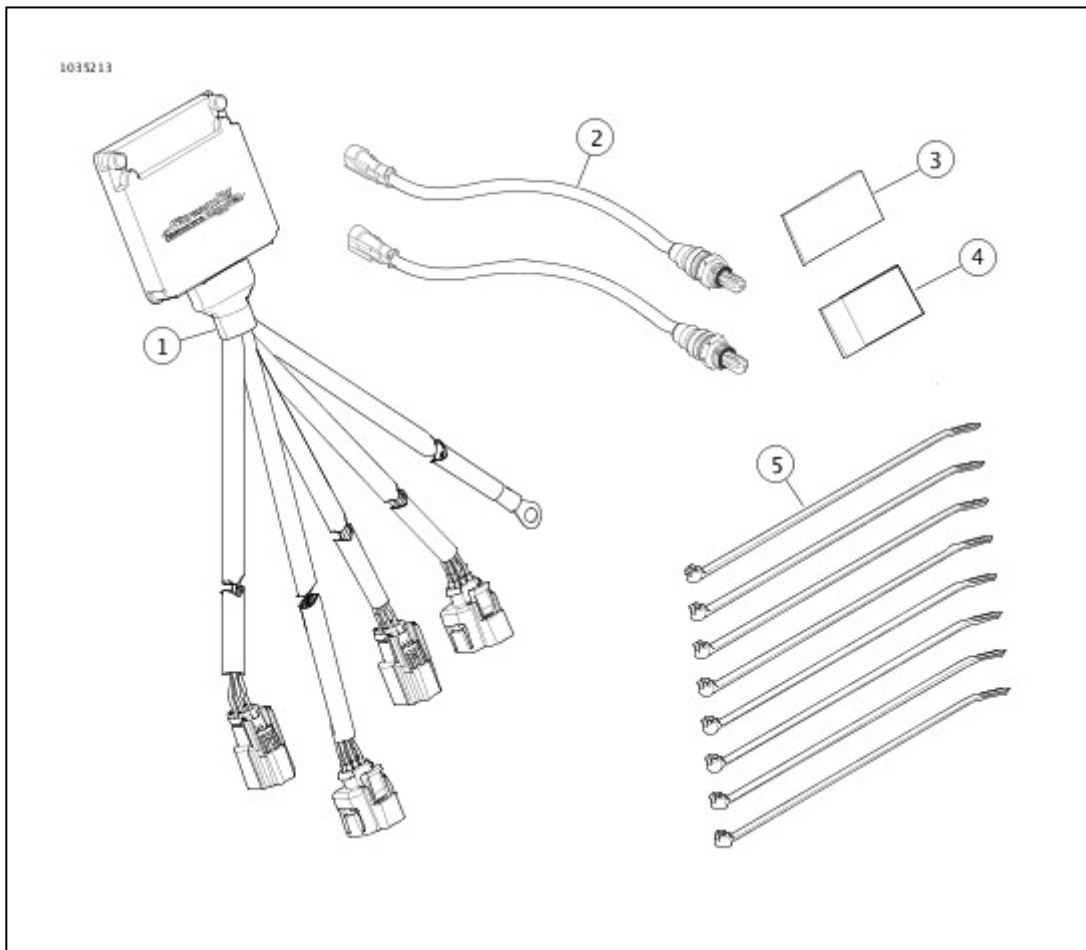


Figure 30.

Table 2. Kit Contents

ITEM	DESCRIPTION (QUANTITY)	PART NUMBER
1	Wideband O2 Control Module Assembly	41000446
2	Oxygen Sensor, Wideband (2)	32700099
3	Environmental Protection Agency (EPA) Label	Not Sold Separately
4	Dual Lock Fastener (2)	Not Sold Separately
5	Cable Strap (8)	Not Sold Separately