



INSTRUCTIONS

J06508

2024-01-29



SMART TUNE PRO AUTOMATIC TUNING MODULE (ATM) KIT

GENERAL

Kit Number

41000445

Models

For up to date certified model fitment information, see the Parts and Accessories section of www.harley-davidson.com (English only).

Installation Requirements

Visit <https://serviceinfo.harley-davidson.com> for the latest instruction sheet.

These items are available at your local Harley-Davidson dealership.

- Separate purchase of Screamin' Eagle Pro Street Tuner (Part No. 41000008C) or Screamin' Eagle Bluetooth Pro Street Tuner (Part No. 41001141) is required for this installation.
- Screamin' Eagle Tuner Cable Kit (Part No. 41000018) is required for this installation with Screamin' Eagle Pro Street Tuner (Part No. 41000008C).
- **2024 FLHX, FLTRX, and FLTRXSTSE:** Separate purchase of Exhaust Oxygen Sensor (Wide Band O2) Bung Drill Kit (Part No. 14900150) is required for installation.
- **2024 FLHX, FLTRX, and FLTRXSTSE:** Separate purchase of Exhaust Oxygen Sensor (Wide Band O2) Bung Drill and Tap Tool Kit (Part No. 14900105) is required for installation.
- **2017-2024 Touring models (excludes 2024 FLHX, FLTRX and FLTRXSTSE):** Separate purchase of Exhaust Oxygen Sensor Bung Drill And Tap Tool Kit (Part No. 14900105) is required for installation. An optional separate purchase of Screamin' Eagle High-Flow Exhaust System with Street Cannon Mufflers (Part No. 64800059 or 64800062).
- **2017 and later Trike models:** Separate purchase of Exhaust Oxygen Sensor Bung Drill And Tap Tool Kit (Part No. 14900105) is required for installation. An optional separate purchase of Screamin' Eagle High-Flow Exhaust System with Street Cannon Mufflers (Part No. 64800059 or 64800062).
- **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.
- **2018 and later Softail models:** Separate purchase of Wide Band Oxygen Sensor Wire Harness Extension Kit (Part No. 69201830) is required for this installation.
- **2016-2017 Softail models:** Separate purchase of Harley Davidson Head Pipe Assembly is required for this installation. Table 1

- **2016-2017 Softail models:** Separate purchase of Wide Band Oxygen 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. 66884-09A) is required for this installation.
- **2016-2017 Dyna Low Rider S (FXDLS) model:** Separate purchase of Wide Band Oxygen Sensor Wire Harness Extension Kit (Part No. 69201704) is required for this installation.
- **2014 and later Sportster models:** Separate purchase of Wide Band Oxygen Sensor Wire Harness Extension Kit (Part No. 69201830) is required for this installation.
- **2014 and later Sportster models:** Separate purchase of 18 x 1.5 mm exhaust bungs from aftermarket source is required for this installation. **Professional installation of exhaust bung is required.**

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, 66795-08

Table 2. Oxygen Sensor Bung Specifications

Oxygen Sensor Bung Requirements	
Bung length minimum:	Length: 9 mm (0.360 in)
Bung length maximum:	Length: 13 mm (0.500 in)
Bung material:	300 Series stainless steel
Bung thread pitch:	M18 x 1.5
Sensor protrusion into exhaust pipe:	Length: 13 mm (0.500 in)
Installation notes:	
Professional installation is required. Surfaces must be properly prepared. Weld should be complete around the bung and free of all leaks. Wideband sensor should be located as close as possible in the stock sensor location to ensure measured wideband AFR values correlate to factory sensors when operating in the same range. Bung should be located so that sensor has clearance and that wires do not touch the exhaust. When the bike is in the vertical position, the sensor should be mounted nearly horizontal but with the tip down to reduce risk of moisture on the sensor. Condensation in the exhaust can cause sensor damage.	

⚠ 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 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, 2016 and later Dyna FXDLS and 2014 and Later Sportster 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 52 and Table 5

▲ WARNING

Rider and passenger safety depend 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. (00308b)

INSTALLATION

Touring Wide Band Oxygen Sensors

Table 3. Models Affected

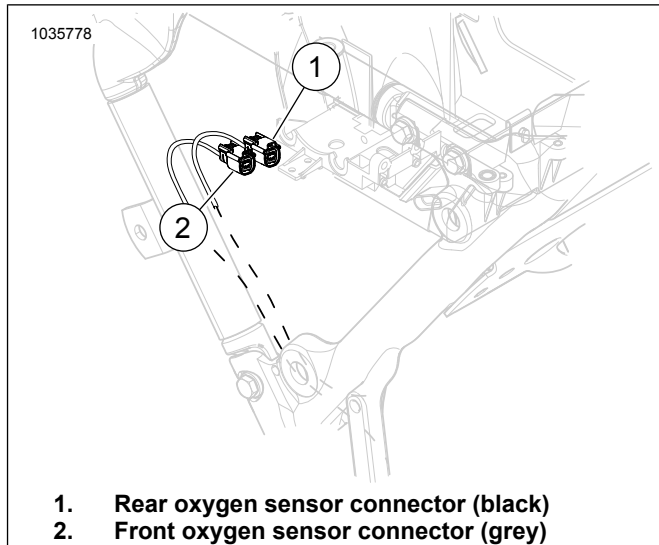
Year	Model
2024	FLHX, FLTRX, FLTRXSTSE

1. Remove saddlebags. See service manual.
2. Remove main fuse. See service manual.
3. Remove seat. See service manual.
4. Remove battery. See service manual.
5. Remove right front footboard and brackets from frame. See service manual.

NOTE

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

6. See Figure 1. Disconnect front and rear oxygen sensor connectors (1, 2).



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

Figure 1. Front and Rear Oxygen Sensor Location

7. Remove exhaust system. See service manual.
8. Exhaust pipe:
 - a. 2024 FLHX, FLTRX and FLTRXSTSE models: Rework exhaust pipe. Use Exhaust Oxygen Sensor Bung Drill And Tap Tool Kit (Part No. 14900150 and 14900105) to complete procedure. Both kits are required. Installation Requirements
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 2, Figure 52 and Table 5 Install wide band oxygen sensors (2). Using Oxygen Sensor Socket (Part No. HD-48262-A) tighten to:
Torque: 40–60 N·m (29–44 ft-lbs)



Figure 2. 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 transmission cover.

If there is contact between the oxygen 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.

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

NOTE

ATM has four leads and a ground wire.

11. See Figure 3 and Figure 5. Install ATM (1) on exterior wall of battery area, behind rear cylinder with cables pointing toward right side of vehicle.
 - a. Route all four connectors under harness, through bottom of "V" formation of frame into side cover area.
 - b. See Figure 7. Route ground wire up through rectangular hole toward ground posts.

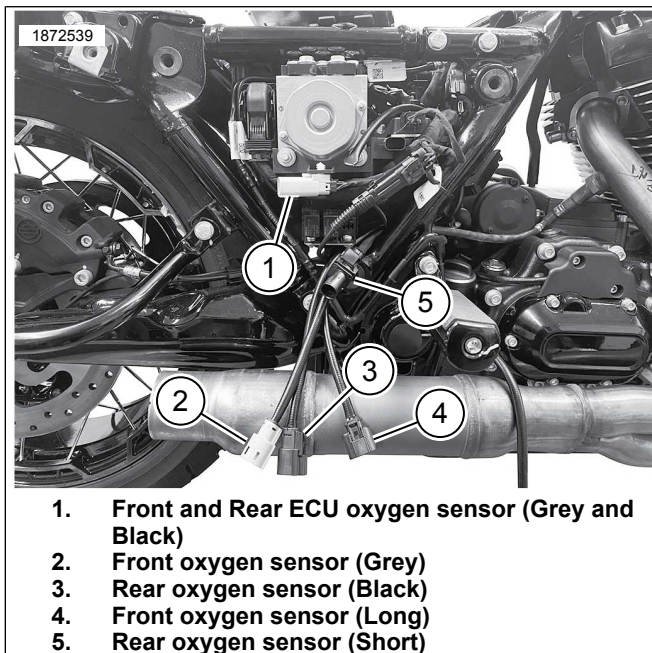
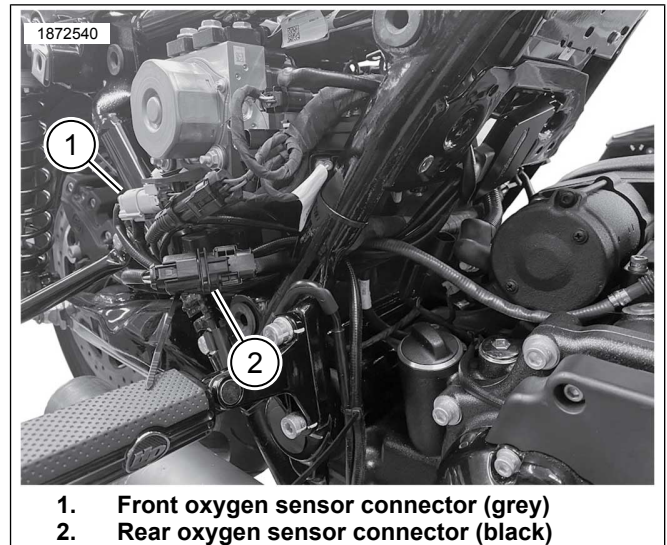


Figure 3. Grey and Black Connector Harness Routing

12. See Figure 4 and Figure 8. Route front and rear oxygen sensor connector harness leads (1, 2) up towards corresponding connectors. Color match harness connectors: Black to Black, Grey to Grey.



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

Figure 4. ATM Main Harness Connections

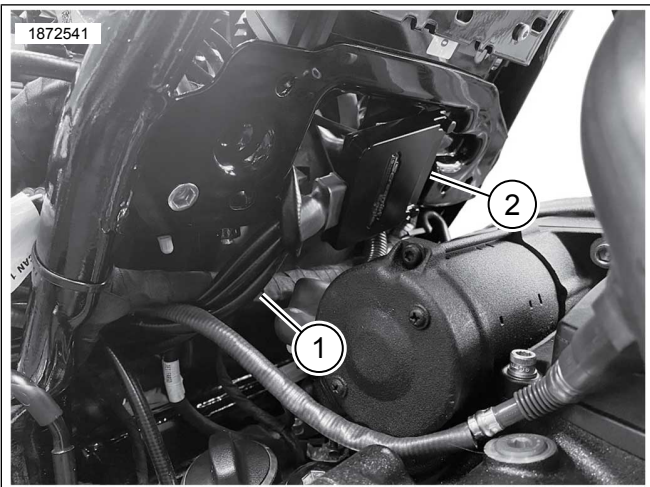
13. See Figure 5. Install ATM.

- a. Clean mounting surface with alcohol pad.
- b. Remove liner from adhesive backing and install dual lock tape to ATM.
- c. Remove liner from adhesive backing of dual lock tape and install ATM (1) on exterior of battery compartment area, behind rear cylinder.
- d. Install module at down angle of 10 to 20 degrees. Without this angle, the installation of CoolFlow Fan (Part No. 26800128), ATM wiring will interfere with fan installation.

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 (1) facing right toward the inboard side of the frame.



1. ATM with harness
2. ATM Mounting location

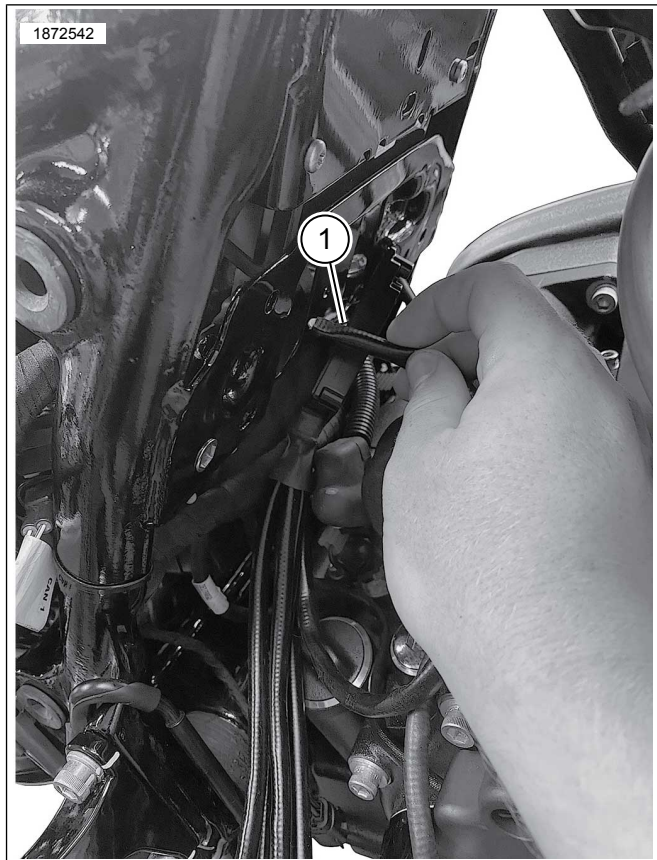
Figure 5. ATM Mounting Location

15. **NOTE**

- Ground posts are located on right and left in front of battery compartment.
- 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. The clean ground also has the negative battery cable chassis ground attached to it and is typically GND1.

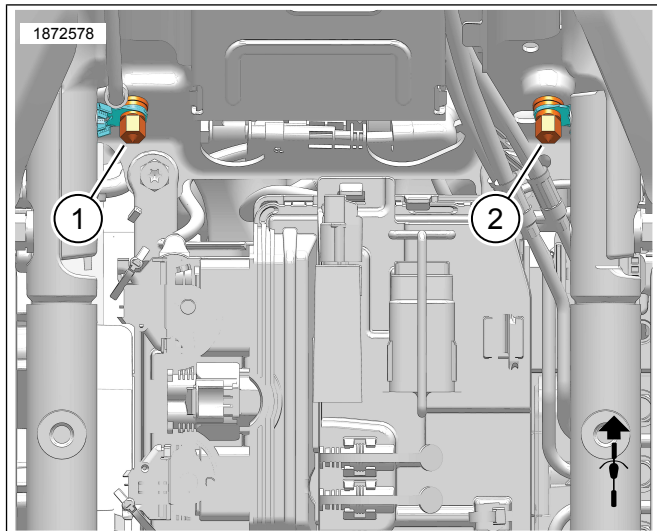
See Figure 7. Route and connect ATM ground wire to **clean** ground post (2). Tighten.

Torque: 6–10 N·m (50–90 in-lbs)



1. Ground wire routing

Figure 6. Ground Wire Routing



1. Ground post (dirty ground)
2. Ground post (clean ground)

Figure 7. Battery Box Ground Post Locations

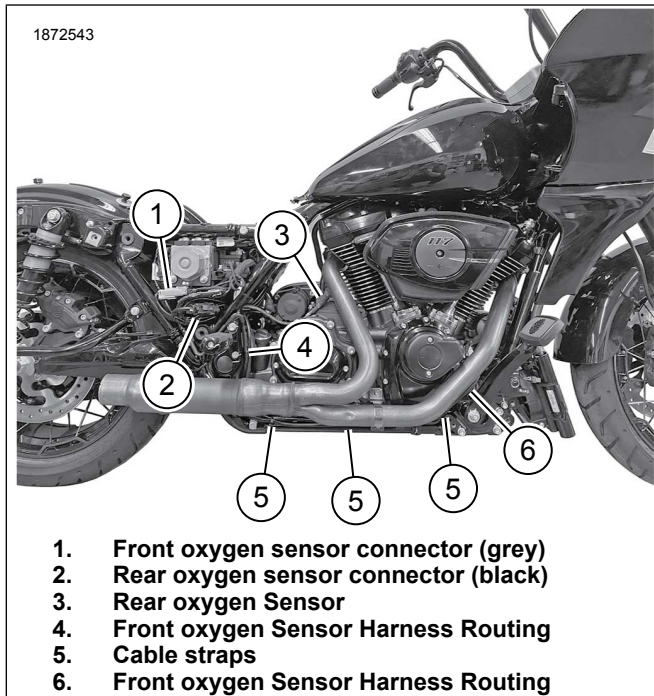
16. See Figure 8. **Front oxygen sensor (5, long harness lead):**

- a. From front sensor, route and secure oxygen 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 oxygen sensor connector. Install cable straps as needed or use existing clamps and retainers.
- c. Connect oxygen sensor connectors.

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

- a. See Figure 4 and Figure 5. To eliminate excess harness slack, route rear oxygen sensor harness into side cover area along same routing as other connectors.
- b. Plug into shorter of the two oxygen sensor connectors on ATM.
- c. Use cable straps to secure harness and connectors as needed.

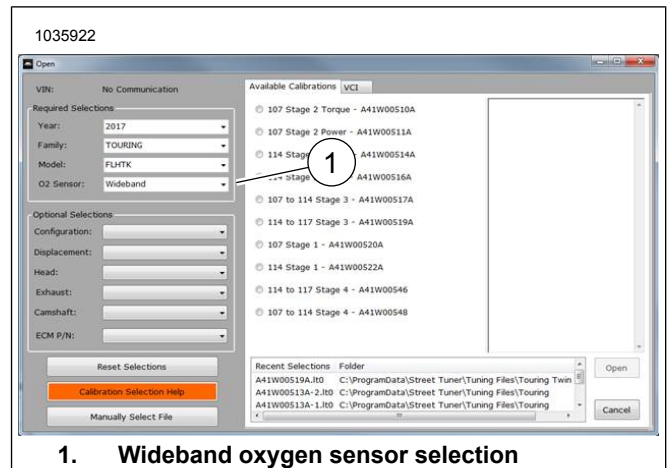


- 1. Front oxygen sensor connector (grey)
- 2. Rear oxygen sensor connector (black)
- 3. Rear oxygen Sensor
- 4. Front oxygen Sensor Harness Routing
- 5. Cable straps
- 6. Front oxygen Sensor Harness Routing

Figure 8. ATM Sensor Harness Routing

- 18. Make sure all harnesses and connectors are secured and not located in any hot zones.
- 19. Install right front footboard and brackets to frame. See service manual.
- 20. Install battery, battery caddy and attach ECM. See service manual.
- 21. Install seat. After installing seat, pull up on the seat to verify that it is secure. See service manual.
- 22. Install main fuse. See service manual.
- 23. Install saddlebags. See service manual.

- 24. See Figure 9. 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 oxygen Sensor option. Refer to the Screamin' Eagle Pro catalog or contact a Harley-Davidson dealer for Screamin' Eagle Pro Street Tuner details.



1. Wideband oxygen sensor selection

Figure 9. Wideband Oxygen Sensor Selection

Touring Wide Band Oxygen Sensors

Table 4. Models Affected

Year	Model
2014	FLHR, FLHRC, FLHTCU, FLHTCU TC, FLHTK, FLHX, FLHXS, FLHRSE, FLHTKSE, FLHP, FLHTP
2015	FLHR, FLHRC, FLHTCU, FLHTCUL, FLHTK, FLHTKL, FLHX, FLHXS, FLTRX, FLTRXS, FLHTKSE, FLHXSE, FLHP, FLHTP
2016	FLHR, FLHRC, FLHTCU, FLHTCUL, FLHTCUL TC, FLHTCU TC, FLHTK, FLHTKL, FLHX, FLHXS, FLTRU, FLTRX, FLTRXS, FLHTKSE, FLHXSE, FLHP, FLHTP
2017	FLHR, FLHRC, FLHRXS, FLHTCU, FLHTK, FLHTKL, FLHX, FLHXS, FLTRU, FLTRX, FLTRXS, FLHTKSE, FLHXSE, FLHP, FLHTP
2018	FLHR, FLHRC, FLHRXS, FLHTCU, FLHTK, FLHTKL, FLHX, FLHXS, FLHXS ANX, FLHX ANV, FLTRU, FLHTKSE, FLHTKSE, FLHXSE, FLTRXSE, FLHP, FLHTP
2019	FLHR, FLHRC, FLHRXS, FLHT, FLHTCU, FLHTK, FLHTKL, FLHX, FLHXS, FLTRU, FLTRX, FLTRXS, FLHTKSE, FLHXSE, FLTRXSE, FLHP, FLHTP

Table 4. Models Affected

Year	Model
2020	FLHR, FLHRXS, FLHT, FLHTK, FLHX, FLHXS, FLTRK, FLTRX, FLTRXS, FLHTKSE, FLHXSE, FLTRXSE, FLHP, FLHTP
2021	FLH, FLHR, FLHRXS, FLHT, FLHTK, FLHX, FLHXS, FLTRK, FLTRX, FLTRXS, FLHTKSE, FLHXSE, FLTRXSE, FLHP, FLHTP
2022	FLHR, FLHRXS, FLHT, FLHTK, FLHX, FLHXS, FLHXST, FLTRK, FLTRX, FLTRXS, FLTRXST, FLHXSE, FLTRKSE, FLTRXSE, FLHP, FLHTP
2023	FLHFB, FLHRXS, FLHTK, FLHTKANV, FLHX, FLHXS, FLHXSANV, FLHXST, FLTRK, FLTRX, FLTRXS, FLTRXSANV, FLTRXST, FLTRKSEANV, FLHP, FLHTP

1. Remove saddlebags. See service manual.
2. Remove main fuse. See service manual.
3. Remove seat. See service manual.
4. Remove battery. See service manual.
5. Remove right front footboard and brackets from frame. See service manual.

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

See Figure 10. Disconnect front (2) and rear (1) oxygen sensor connectors.

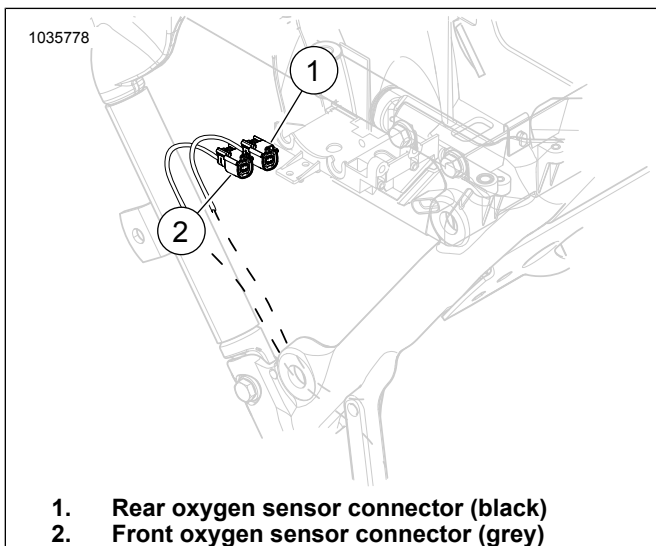


Figure 10. Front and Rear Oxygen Sensor Location

7. Remove exhaust system. See service manual.

8. Exhaust pipe:

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

NOTE

No rework is required on Screamin Eagle High-Flow Exhaust System. Bungs accept wide band oxygen sensors.

- b. **2017-later models:** Rework exhaust pipe. Use Exhaust Oxygen Sensor Bung Drill And Tap Tool Kit (Part No. 14900105) to complete procedure or install Screamin Eagle High-Flow Exhaust System with Street Cannon Mufflers for oxygen sensor installation

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 11, Figure 52 and Table 5 Install wide band oxygen sensors (2). Using Oxygen Sensor Socket (Part No. HD-48262-A) tighten to:

Torque: 40–60 N·m (29–44 ft-lbs)



Figure 11. 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 transmission cover.

If there is contact between the oxygen 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.

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

11. **NOTE**
ATM has four leads and a ground wire.

See Figure 12. 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.

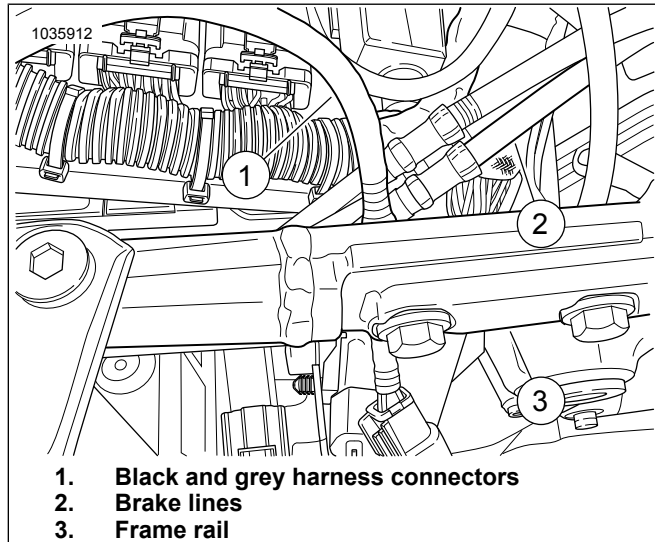


Figure 12. Grey and Black Connector Harness Routing

12. See Figure 13 and Figure 8. 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.

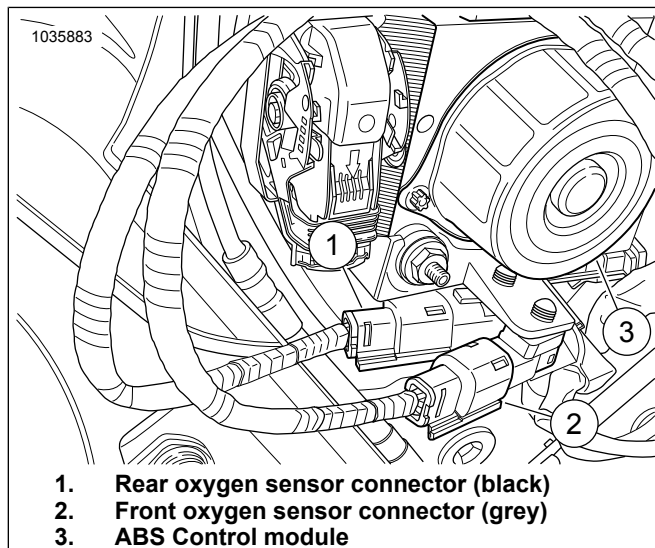


Figure 13. ATM Main Harness Connections

13. See Figure 14. 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.

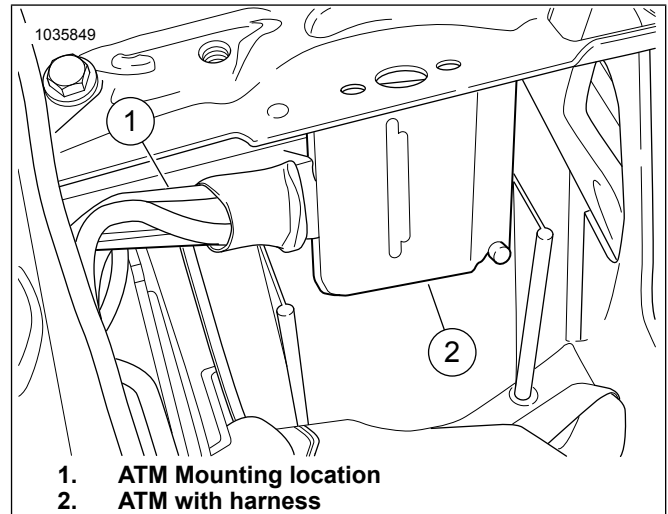
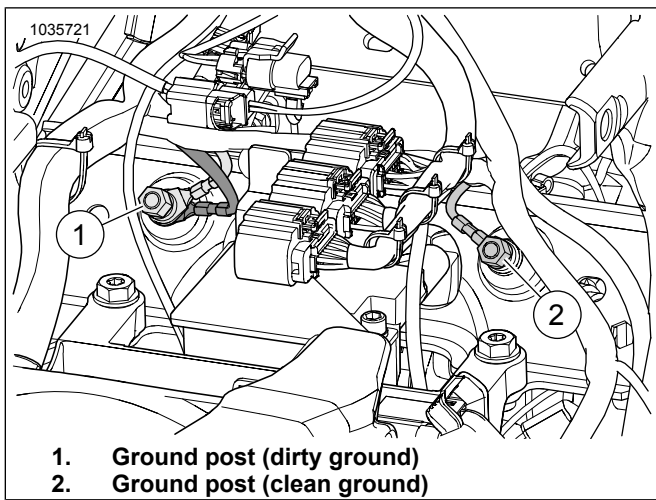


Figure 14. ATM Mounting Location

15. **NOTE**
- Ground posts are located on right and left in front of battery compartment.
 - Grounds can be classified as either clean or dirty grounds. Clean grounds are identified by a (BK/GR) wire and are normally used for sensors or modules. The clean ground also has the negative battery cable chassis ground attached to it and is typically GND1.

See Figure 15. Route and connect ATM ground wire to **clean** ground post (2). Tighten to:

Torque: 6–10 N·m (50–90 in-lbs)



1. Ground post (dirty ground)
2. Ground post (clean ground)

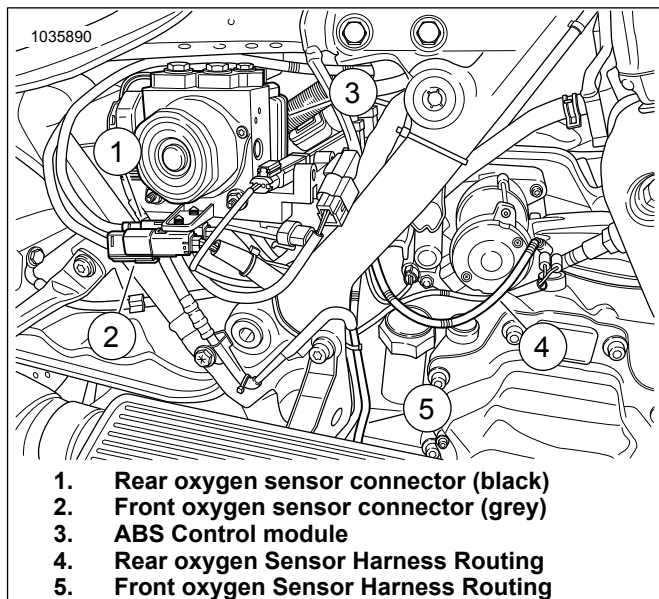
Figure 15. Battery Box Ground Post Locations

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

- a. From front sensor, route and secure oxygen 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 oxygen sensor connector. Install cable straps as needed or use existing clamps and retainers.
- c. Connect oxygen sensor connectors.

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

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



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

Figure 16. ATM Sensor Harness Routing

18. Make sure all harnesses and connectors are secured and not located in any hot zones.

19. Install right front footboard and brackets to frame. See service manual.

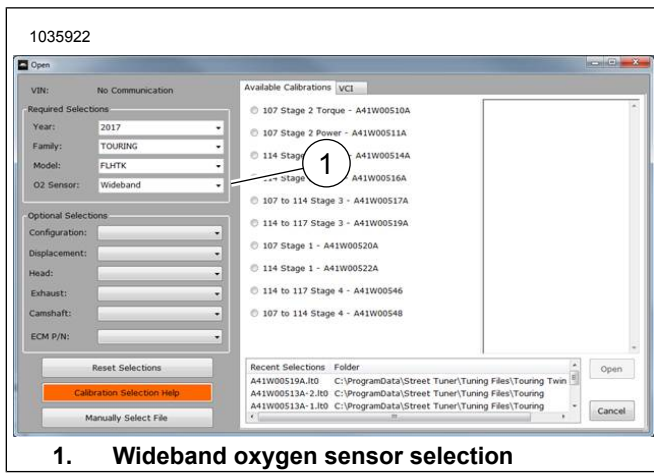
20. Install battery, battery caddy and attach ECM. See service manual.

21. Install seat. After installing seat, pull up on the seat to verify that it is secure. See service manual.

22. Install main fuse. See service manual.

23. Install saddlebags. See service manual.

24. See Figure 17. 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 Oxygen Sensor option. Refer to the Screamin' Eagle Pro catalog or contact a Harley-Davidson dealer for Screamin' Eagle Pro Street Tuner details.



1. Wideband oxygen sensor selection

Figure 17. Wideband Oxygen Sensor Selection

2018 and Later Softail Wide Band Oxygen Sensors

1. Remove main fuse. See service manual.
2. Remove seat. See service manual.
3. Remove right side cover. See service manual.
4. Disconnect negative battery cable. See service manual.

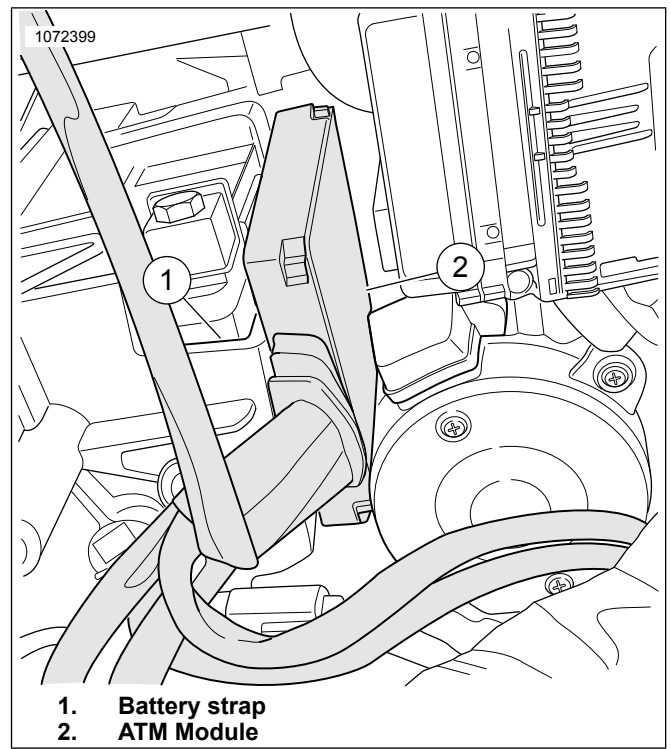
5. *NOTE*

Make sure that the ATM module is not touching other components.

Position module so that the ground wire can reach the ground post.

See Figure 18. Position ATM module.

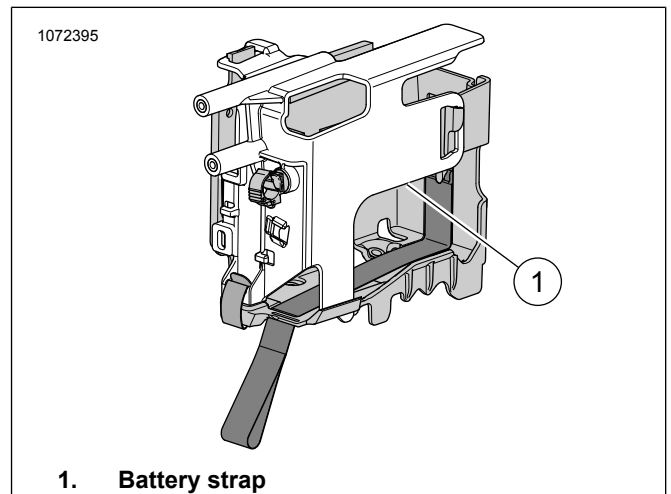
- a. Position ATM module (2) on battery strap (1).
- b. Mark location of module.
- c. Remove ATM module.



1. Battery strap
2. ATM Module

Figure 18. Position Module

6. See Figure 19. Remove battery strap (1). See service manual.



1. Battery strap

Figure 19. Battery Strap Location

7. *NOTE*

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

See Figure 20. Disconnect rear oxygen sensor connector (1) from main harness.

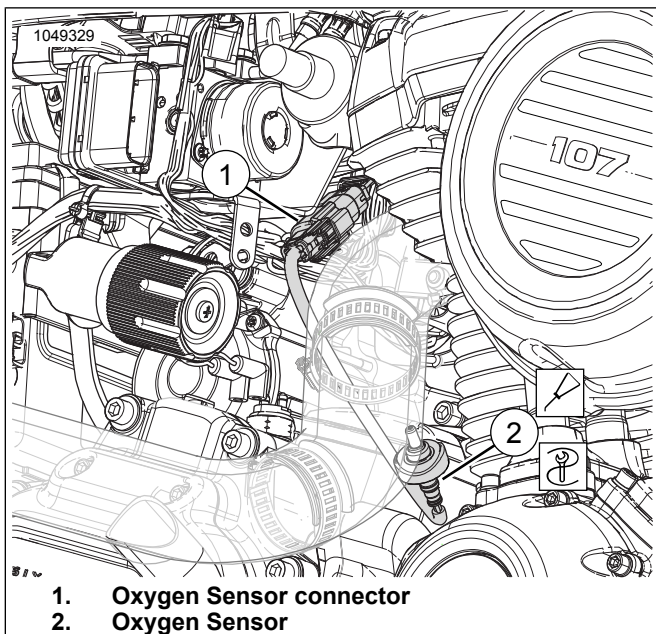


Figure 20. Rear Oxygen Sensor

8. **NOTE**

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

See Figure 21. Disconnect front oxygen sensor connector (1) from main harness.

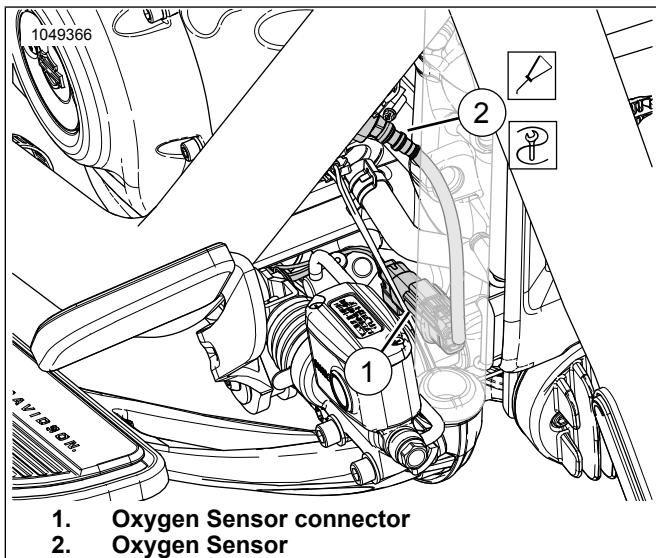


Figure 21. Front Oxygen Sensor

9. Remove exhaust pipe. See service manual.

10. Drill and tap both oxygen sensor ports on exhaust system. Use Exhaust Oxygen Sensor Bung Drill And Tap Tool Kit (Part No. 14900105) to complete procedure.

11. **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 22, Figure 52 and Table 5 Install wide band oxygen sensors (2). Using Oxygen Sensor Socket (Part No. HD-48262-A) tighten to:

Torque: 40–60 N·m (29–44 ft-lbs)

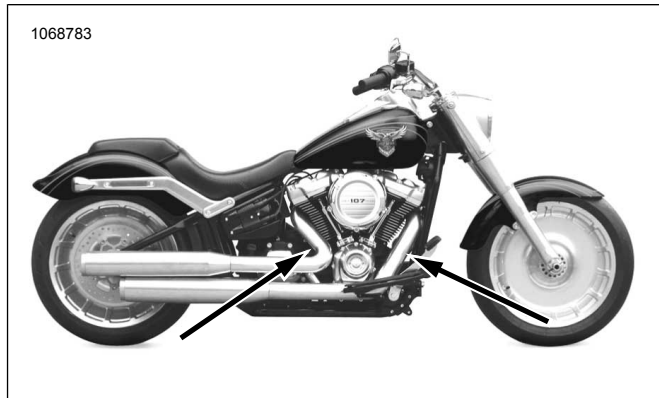


Figure 22. Oxygen Sensor Locations (Inboard Side of Exhaust Pipes)

12. Install exhaust pipe with new exhaust gaskets. See service manual.

13. See Figure 19. Install battery strap.

- 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 to marked up area of battery strap.
- Install ATM to battery strap.
- Install battery strap.

14. **NOTE**

Ground post is located under seat on left frame rail.

Make sure ground wire does not interfere with shock movement.

See Figure 23. Route and connect ATM ground wire to rear clean ground post (1). Tighten to:

Torque: 6–10 N·m (50–90 in-lbs)

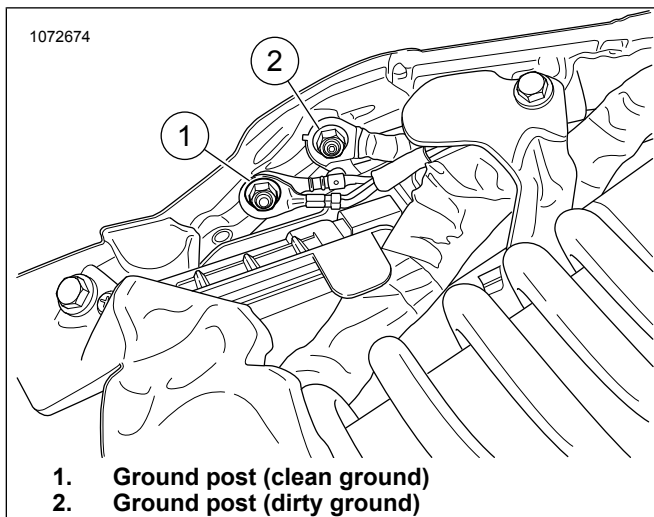


Figure 23. Frame Ground

15.

NOTE

Wire extension harness will have one end with a grey connector and the other end with a black connector.

Connect Wide Band Oxygen Sensor Wire Harness Extension Kit (Part No. 69201830) to ATM harness assembly. Color match connectors: grey to grey.

16. See Figure 24 and Figure 25. Route front oxygen harness with grey connector (4) out of battery compartment:

- a. Locate main harness (6).
- b. Route harness (4) with grey connector along main harness toward the front main harness connector (9).
- c. Color match oxygen sensor connectors: black to black.
- d. Secure harness to inboard side of right frame rail (8) with cable straps as needed.

17. Route black harness connector (2) to main harness. Color match connectors: black to black.

18. **Front oxygen sensor (long harness lead):**

- a. Route front oxygen sensor connector harness (5) out of battery compartment.
- b. Locate main harness (6).
- c. Route harness (5) along main harness toward the front oxygen sensor (7).
- d. Connect sensor connectors.
- e. Secure harness to inboard side of right frame rail (8) with cable straps as needed.

19. **Rear oxygen sensor (short harness lead):**

- a. Route harness along top of transmission.
- b. Connect sensor connectors (3).

c. Secure harness with cable straps as needed.

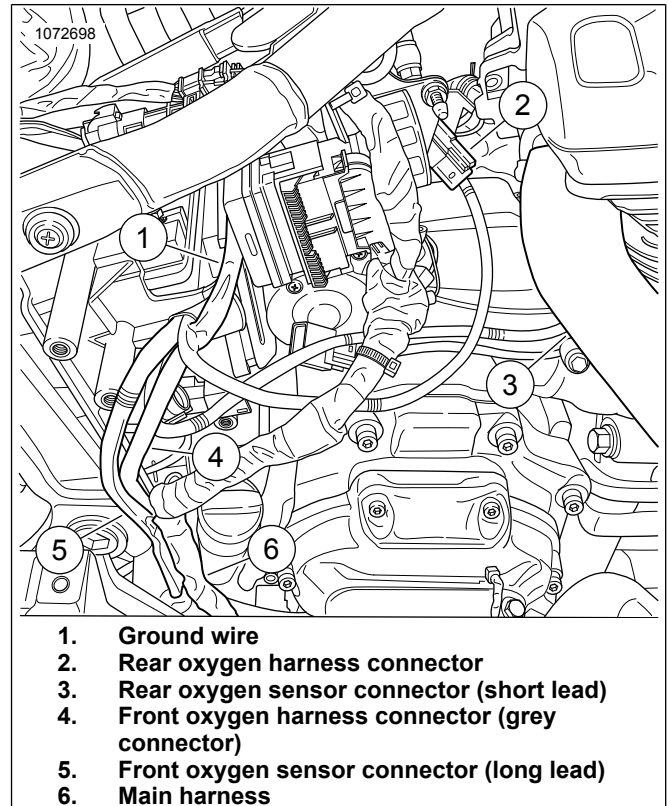


Figure 24. ATM Harness Routing

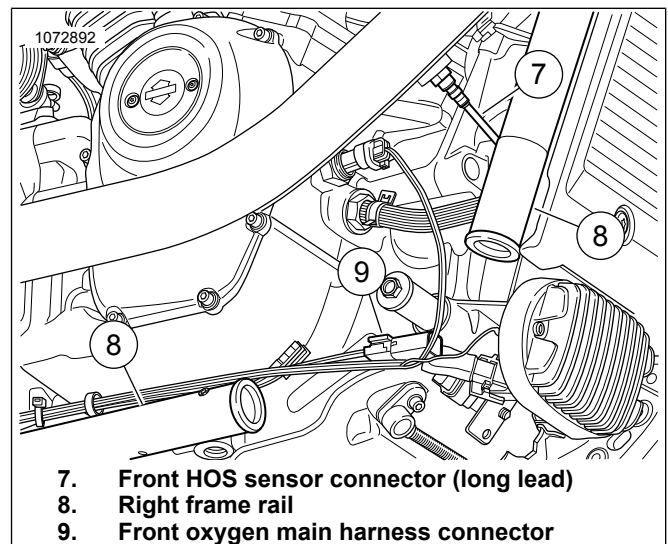


Figure 25. Front ATM Harness Routing (Parts removed for clarity)

20. Make sure all harnesses and connectors are secured and not located in any hot zones.

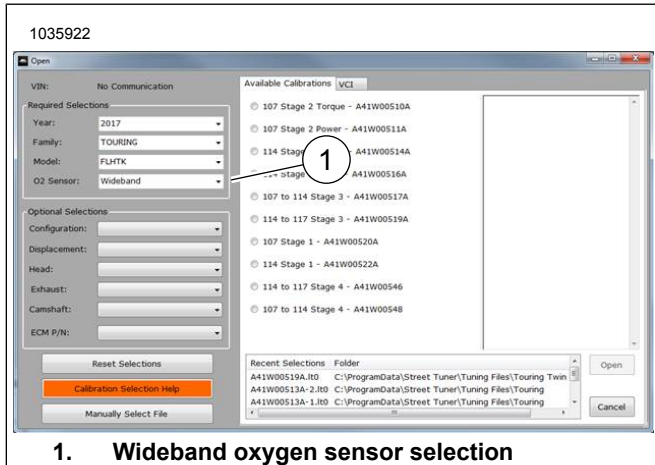
21. Connect negative battery cable. See service manual.

22. Install right side cover. See service manual.

23. Install seat. After installing seat, pull up on the seat to verify that it is secure. See service manual.

24. Install main fuse. See service manual.

25. See Figure 26. Use Screamin' Eagle Pro Street Tuner to complete installation. Download new ECM calibration when installing this kit. When selecting a calibration, select Wideband with the Screamin' Eagle Pro Street Tuner, select Wideband (1) from the pull down menu for the Oxygen Sensor option. Refer to the Screamin' Eagle Pro catalog or contact a Harley-Davidson dealer for Screamin' Eagle Pro Street Tuner details.



1. Wideband oxygen sensor selection

Figure 26. Wideband Oxygen Sensor Selection

2016-2017 Softail Wide Band Oxygen Sensors

1. Remove main fuse. See service manual.
2. Remove seat. See service manual.
3. Remove battery. See service manual.
4. See Figure 27. Remove battery caddy. See service manual.

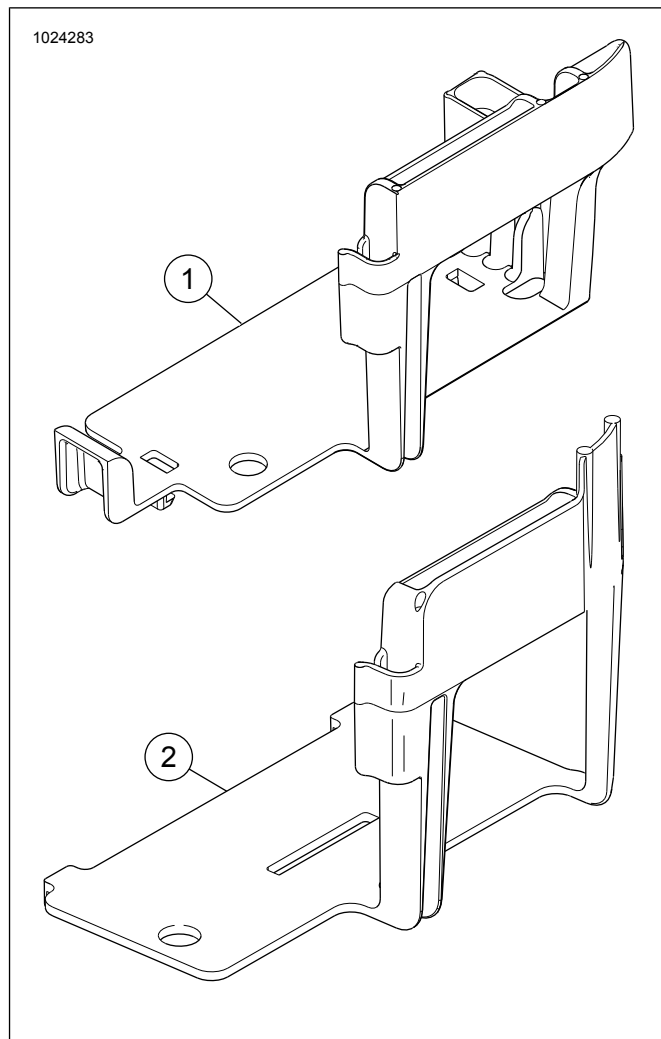


Figure 27. Non-Modified Softail Battery Caddy

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 28, Figure 29, and Figure 30. 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.

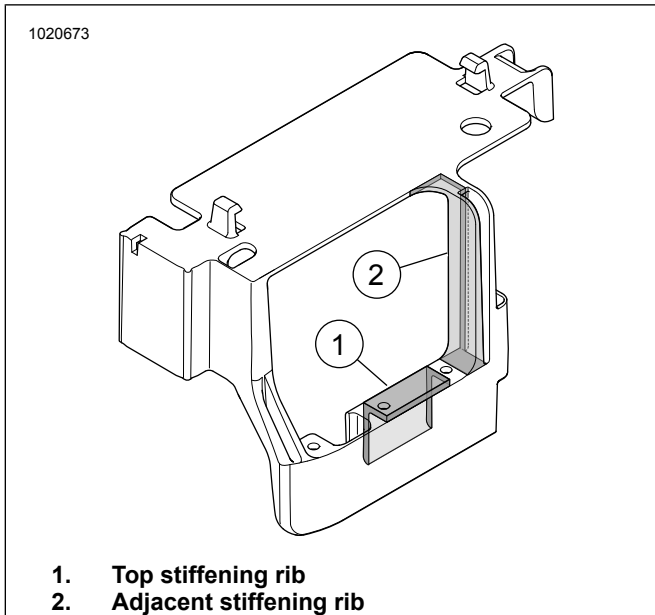


Figure 28. Areas Highlighted To Be Cut Away

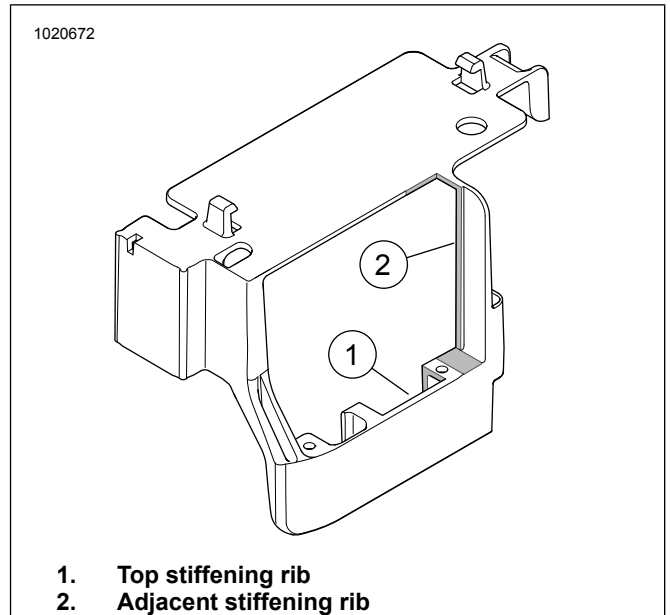


Figure 30. Back of Caddy Cut Away

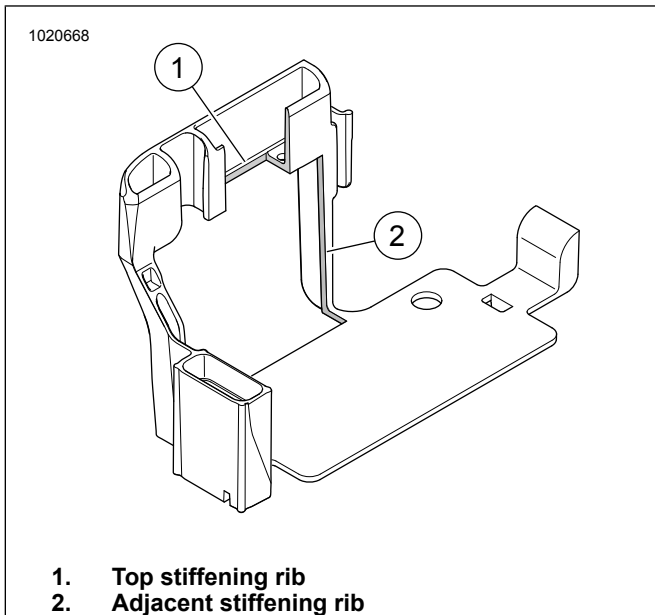


Figure 29. Front of Caddy Cut Away

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

See Figure 31. Disconnect rear (1) oxygen sensor connectors from main harness.

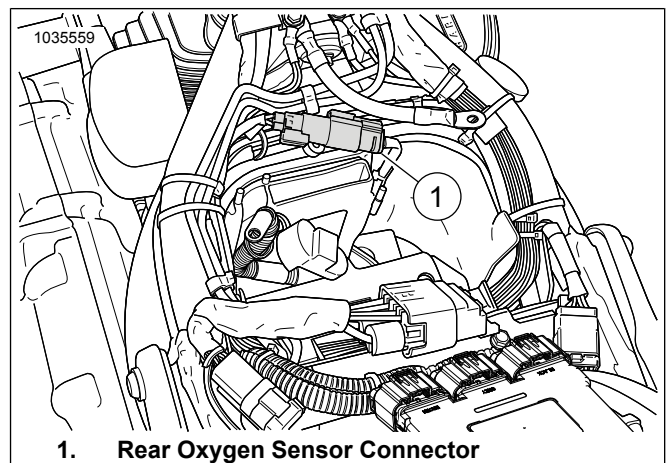
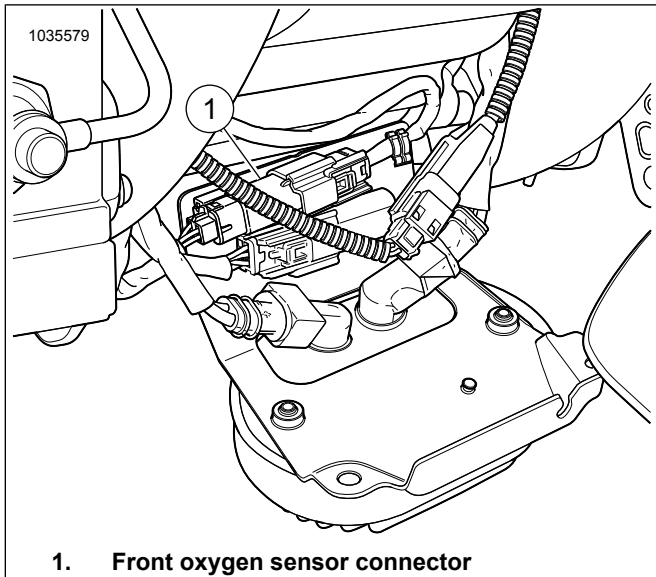


Figure 31. Rear Oxygen Sensor Location

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

See Figure 32. Open front voltage regulator cover and disconnect front oxygen sensor connector (1). Remove connector housing from caddy.



1. Front oxygen sensor connector
Figure 32. Front Oxygen Sensor Location

8. Remove exhaust pipe. See service manual.

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 33, Figure 52 and Table 5 Install wide band oxygen sensors (2). Using Oxygen Sensor Socket (Part No. HD-48262-A) tighten to:

Torque: 40–60 N·m (29–44 ft-lbs)



Figure 33. Oxygen Sensor Locations (Inboard Side of Exhaust Pipes)

10. Install exhaust pipe with new exhaust gaskets. See service manual.

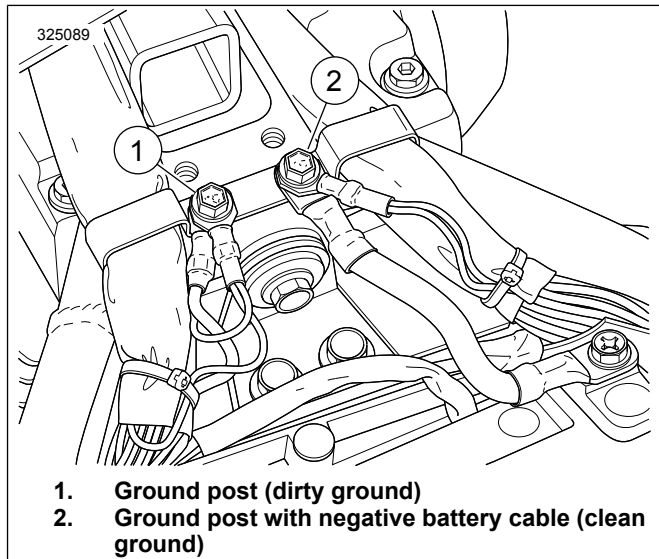
11. Install battery caddy with ATM. Adjust and reposition as needed.

12. **NOTE**

Ground post is located in front of battery compartment.

See Figure 34. Connect ATM ground wire to **clean** ground post. Tighten to:

Torque: 6–10 N·m (50–90 in-lbs)



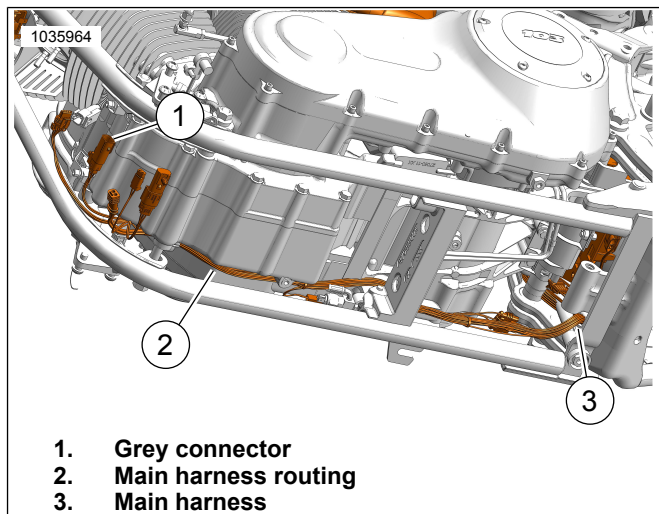
1. Ground post (dirty ground)
 2. Ground post with negative battery cable (clean ground)

Figure 34. Battery Box Ground Post Locations

13. Connect Wide Band Oxygen Sensor Wire Harness Extension Kit (Part No. 69201704) to ATM harness assembly. Color match connectors: grey to grey.

14. See Figure 35. 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.
- d. Secure harness to inboard side of the main harness with cable straps as needed.



1. Grey connector
 2. Main harness routing
 3. Main harness

Figure 35. Harness Routing

15. **NOTE**

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

See Figure 31. Route black harness connector to main harness. Color match connectors: black to black.

16. See Figure 36. **Front oxygen sensor (long harness lead):**

- a. Route harness connector out of battery compartment.
- b. Locate main harness (2).
- c. Route harness along main harness (1) toward the front oxygen sensor connector.
- d. Connect sensor connectors.
- e. Secure harness to inboard side of main harness with cable straps as needed.

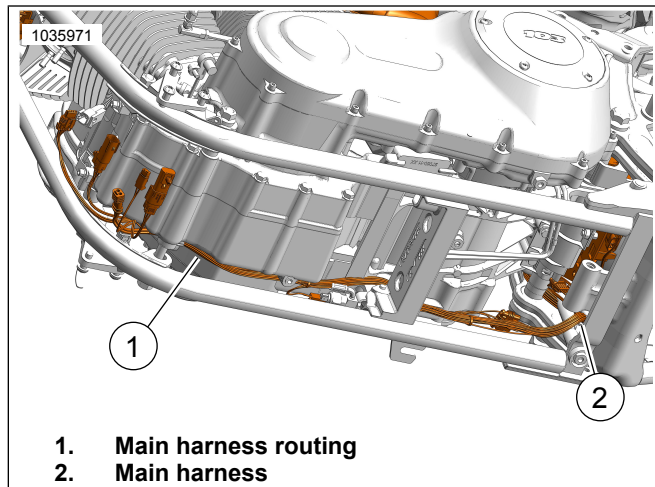


Figure 36. Harness Routing

17. **Rear oxygen 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.

18. Make sure all harnesses and connectors are secured and not located in any hot zones.

19. Install battery. See service manual.

20. Install seat. After installing seat, pull up on the seat to verify that it is secure. See service manual.

21. Install main fuse. See service manual.

22. See Figure 37. 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 Oxygen Sensor option. Refer to the Screamin' Eagle Pro catalog or contact a Harley-Davidson dealer for Screamin' Eagle Pro Street Tuner details.

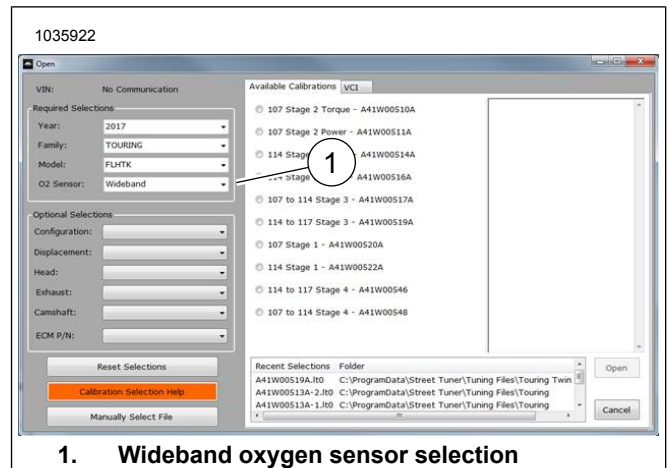


Figure 37. Wideband Oxygen Sensor Selection

Dyna Wide Band Oxygen Sensors

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

4. **NOTE**

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

See Figure 38. Disconnect rear (1) oxygen sensor connectors from main harness.

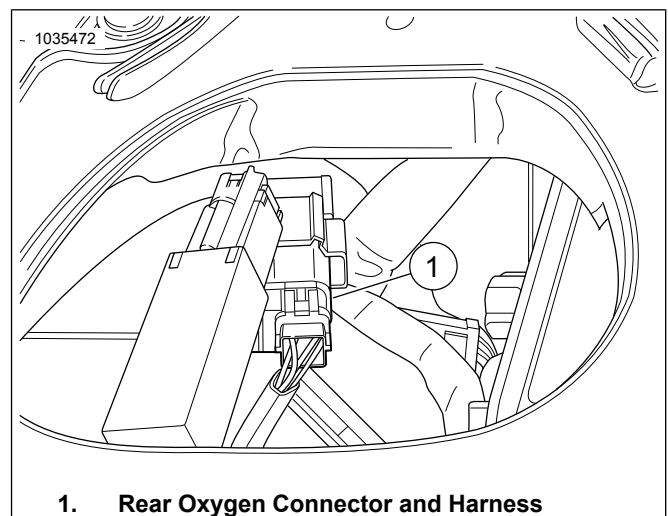
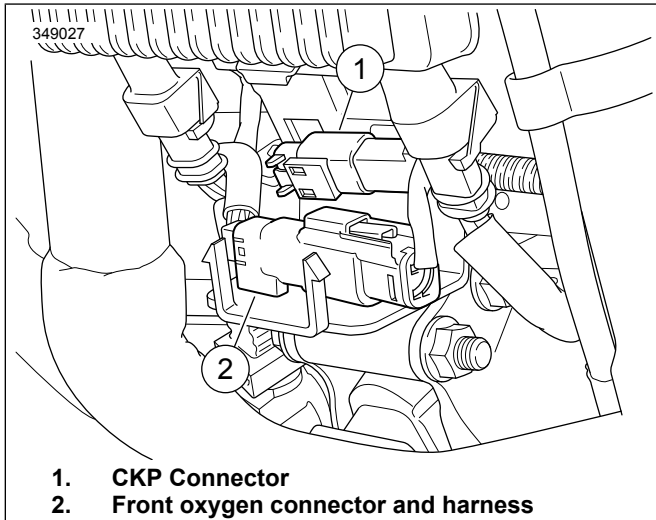


Figure 38. Rear Oxygen Sensor Location

5. **NOTE**

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

See Figure 39. Open front electrical caddy cover and disconnect front oxygen sensor connector (2). Remove connector housing from caddy.



- 1. CKP Connector
- 2. Front oxygen connector and harness

Figure 39. Front Oxygen Sensor Location

6. Remove exhaust pipe. See service manual.

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 40, Figure 52 and Table 5. In exhaust header part no. 64884-09A, install wide band oxygen sensors (2). Using Oxygen Sensor Socket (Part No. HD-48262-A) tighten to:

Torque: 40–60 N·m (29–44 ft-lbs)



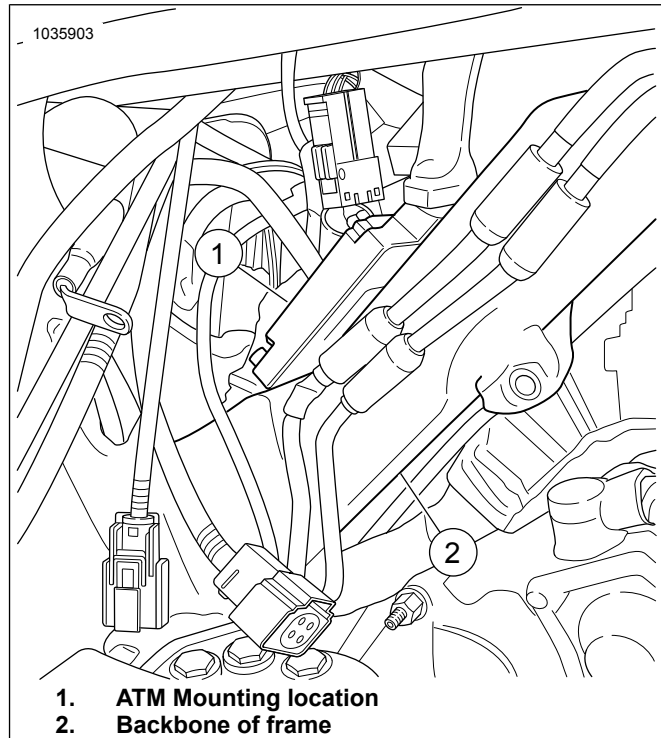
Figure 40. Oxygen Sensor Locations (Inboard Side of Exhaust Pipes)

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

9. **NOTE**

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

See Figure 41. 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

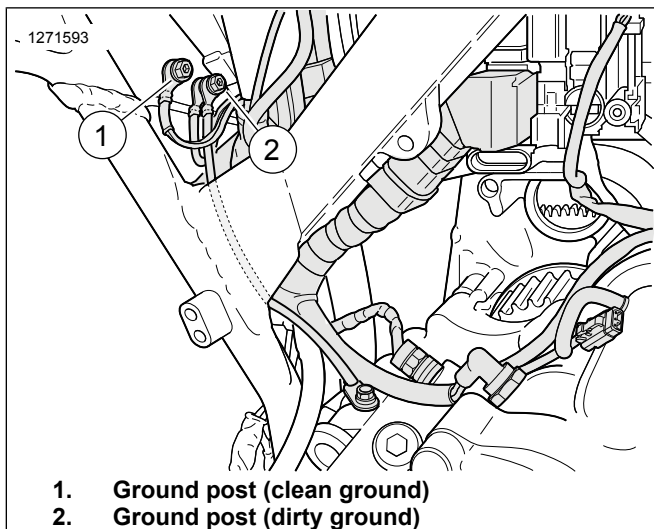
Figure 41. ATM Mounting Location

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.
- **Ground:** Grounds can be classified as either clean or dirty. Clean grounds are identified by a (BK/GN) wire and are normally used for sensors or modules.

See Figure 42. Route and connect ATM ground wire to clean ground post (1). Tighten.

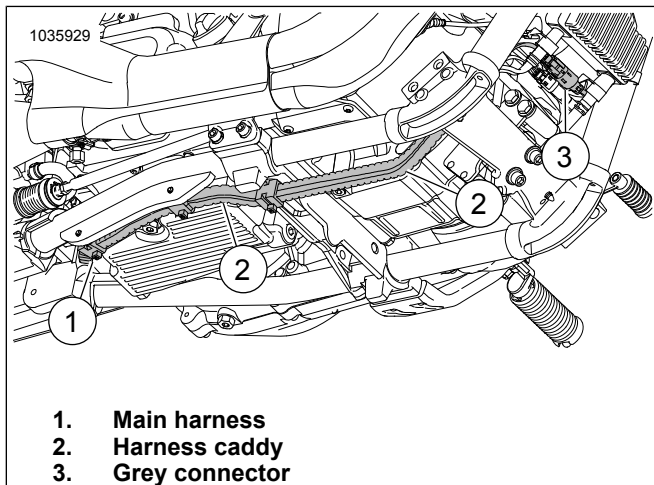
Torque: 6–10 N·m (50–90 in-lbs)



1. Ground post (clean ground)
2. Ground post (dirty ground)

Figure 42. Battery Box Ground Post Locations

11. Connect Wide Band Oxygen Sensor Wire Harness Extension Kit (Part No. 69201704) to ATM harness assembly. Color match connectors: grey to grey.
12. See Figure 43. 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.
 - d. Secure harness to inboard side of harness caddy (2) with cable straps as needed.



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

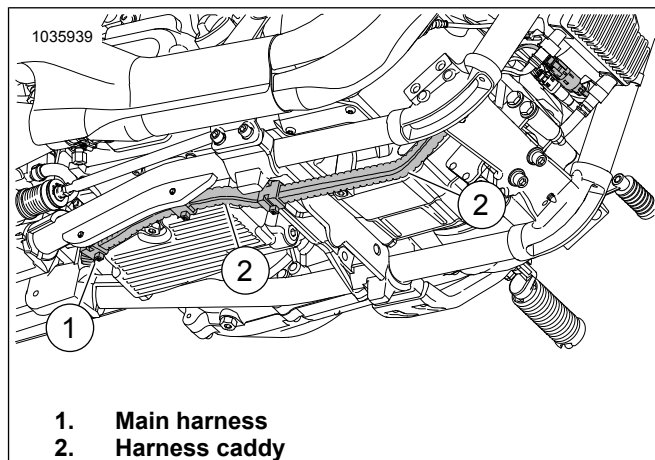
Figure 43. Harness Caddy

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

See Figure 38. Route black harness connector to main harness. Color match connectors: black to black.

14. See Figure 44. **Front oxygen 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 oxygen sensor connector.
- d. Connect sensor connectors.
- e. Secure harness to inboard side of harness caddy (2) with cable straps as needed.



1. Main harness
2. Harness caddy

Figure 44. Harness Caddy

15. **Rear oxygen 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.

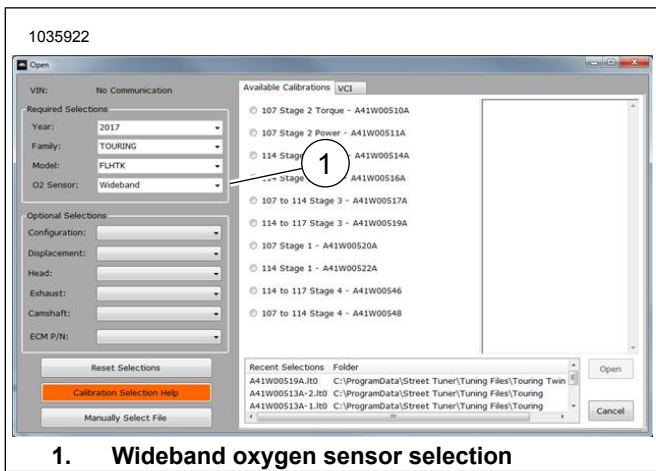
16. Make sure all harnesses and connectors are secured and not located in any hot zones.

17. Install battery caddy and battery. See service manual.

18. Install seat. After installing seat, pull up on the seat to verify that it is secure. See service manual.

19. Install main fuse. See service manual.

20. See Figure 45. 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 Oxygen Sensor option. Refer to the Screamin' Eagle Pro catalog or contact a Harley-Davidson dealer for Screamin' Eagle Pro Street Tuner details.



1. Wideband oxygen sensor selection

Figure 45. Wideband Oxygen Sensor Selection

Sportster Wide Band Oxygen Sensors

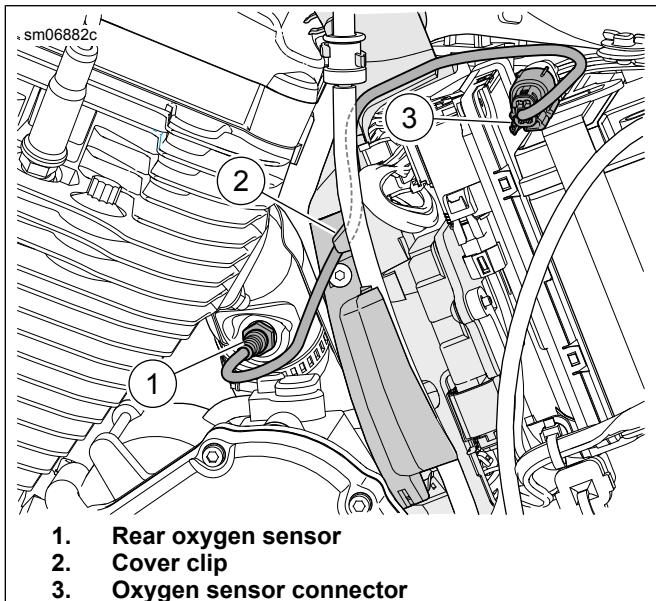
Pending Regulatory Approval. Refer to product information at: www.harley-davidson.com/shop/screamin-eagle

1. Remove main fuse. See service manual.
2. Remove seat. See service manual.
3. Remove left side cover. See service manual.
4. Disconnect negative battery cable. See service manual.

6. NOTE

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

See Figure 46. Disconnect rear oxygen sensor connector (3) from main harness.



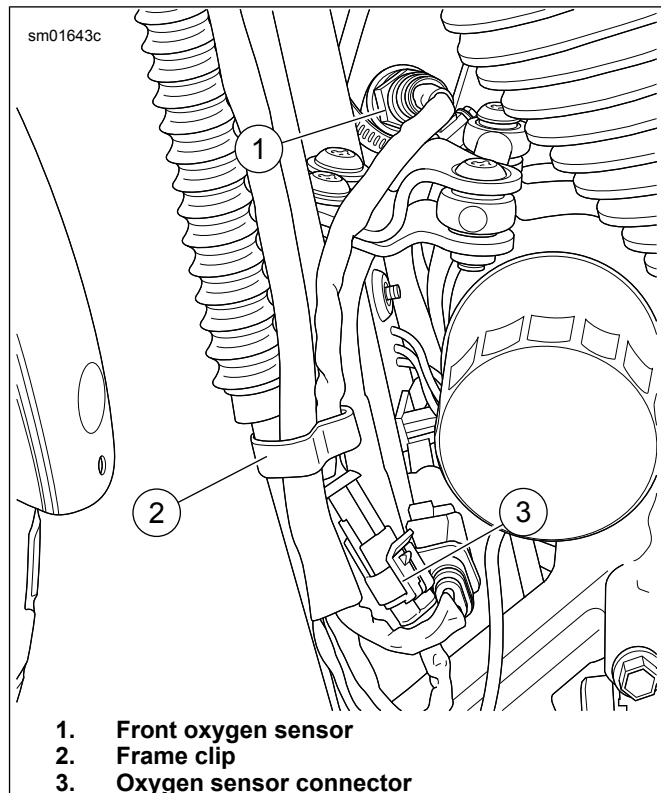
1. Rear oxygen sensor
2. Cover clip
3. Oxygen sensor connector

Figure 46. Rear Oxygen Sensor

6. NOTE

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

See Figure 47. Disconnect front oxygen sensor connector (3) from main harness.



1. Front oxygen sensor
2. Frame clip
3. Oxygen sensor connector

Figure 47. Front Oxygen Sensor

7. Remove exhaust pipe. See service manual.

8. NOTE

A professional welding or metal fabrication shop is highly recommended for removing and installing the oxygen sensor bung.

Remove or plug both stock oxygen sensor bungs from exhaust system.

9. NOTE

Table 2 Oxygen Sensor Bung Specifications at the beginning of this instruction sheet.

Install new oxygen sensor bungs into exhaust system.

10. 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 48, Figure 52 and Table 5. Install wide band oxygen sensors (2). Using Oxygen Sensor Socket (Part No. HD-48262-A) tighten to:

Torque: 40–60 N·m (29–44 ft·lbs)



Figure 48. Oxygen Sensor Locations (Inboard Side of Exhaust Pipes)

11. Install exhaust pipes with new exhaust gaskets. See service manual.
12. See Figure 50. Install ATM module (5).
 - a. Clean mounting surface with alcohol pad.
 - b. Remove liner from adhesive backing and install dual lock tape to ATM.
 - c. Remove liner from adhesive backing of dual lock tape and install ATM to side of battery strap.

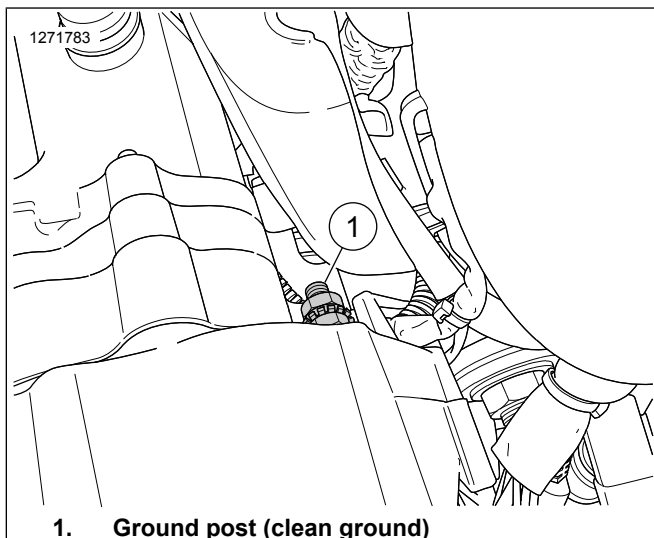
13. **NOTE**

See Figure 49. Ground post (1) is located behind the primary cover on left crankcase half.

Verify negative battery cable is mounted to this grounding point.

See Figure 50. Route and connect ATM ground wire (6) to **clean** ground post. Tighten to:

Torque: 6–10 N·m (50–90 in-lbs)



1. Ground post (clean ground)

Figure 49. Sportster Ground

14. **NOTE**

Wire extension harness will have one end with a grey connector and the other end with a black connector.

Connect Wide Band Oxygen Sensor Wire Harness Extension Kit (Part No. 69201830) to ATM harness assembly. Color match connectors: grey to grey.

15. Route front oxygen grey harness connector out of the back battery compartment:
 - a. Locate ABS harness (7).
 - b. Route harness with grey connector (1) along ABS harness toward left frame rail.
 - c. Route harness (1) along the frame toward the front main harness connector.
 - d. Color match connectors: black to black.
 - e. Secure harness to inboard side of left frame rail with cable straps as needed.
16. Route rear oxygen black harness connector (4) and connect to main harness.
 - a. Color match connectors: black to black.
17. **Front oxygen sensor (long harness lead):**
 - a. Route front oxygen sensor connector harness (2) out of the back battery compartment.
 - b. Locate ABS harness (7).
 - c. Route harness (2) along ABS harness toward left frame rail.
 - d. Route harness (2) along left frame rail toward the front oxygen sensor connector.
 - e. Connect sensor connectors.
 - f. Secure harness to inboard side of left frame rail with cable straps as needed.
18. **Rear oxygen sensor (short harness lead):**
 - a. Route rear oxygen sensor connector harness (4) along top of crankcase.
 - b. Connect sensor connectors.
 - c. Secure harness with cable straps as needed.

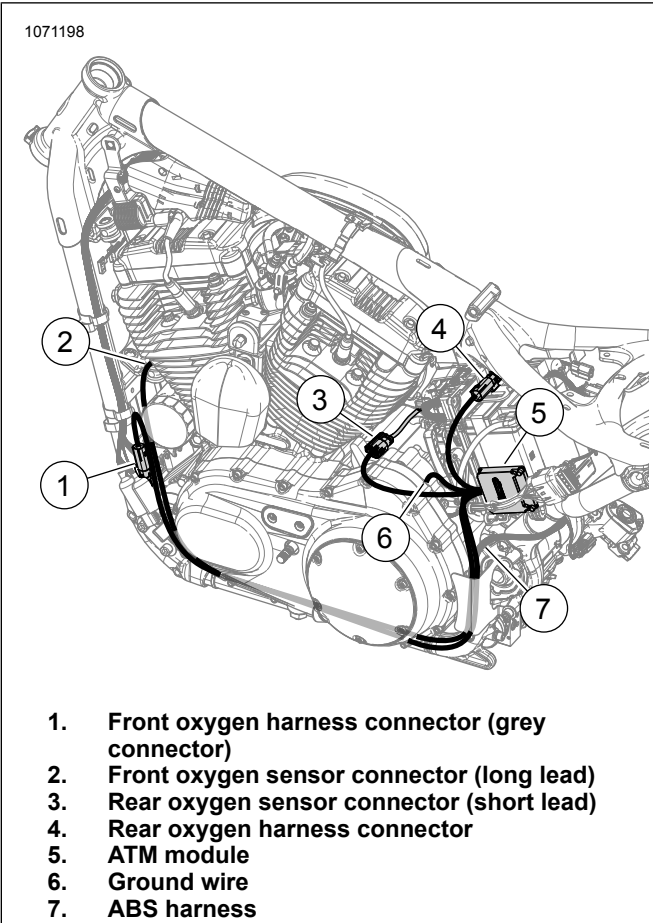


Figure 50. ATM Harness Routing (place holder)

19. Make sure all harnesses and connectors are secured and not located in any hot zones.

20. Connect negative battery cable. See service manual.
21. Install seat. After installing seat, pull up on the seat to verify that it is secure. See service manual.
22. Install left side cover. See service manual.
23. Install main fuse. See service manual.
24. See Figure 51. 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 Oxygen Sensor option. Refer to the Screamin' Eagle Pro catalog or contact a Harley-Davidson dealer for Screamin' Eagle Pro Street Tuner details.

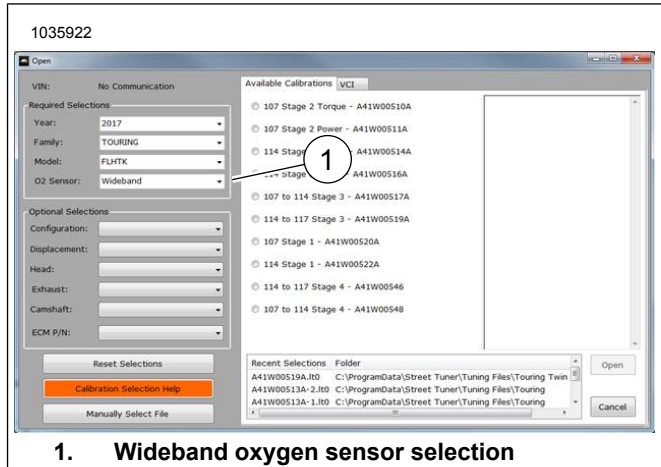


Figure 51. Wideband Oxygen Sensor Selection

SERVICE PARTS

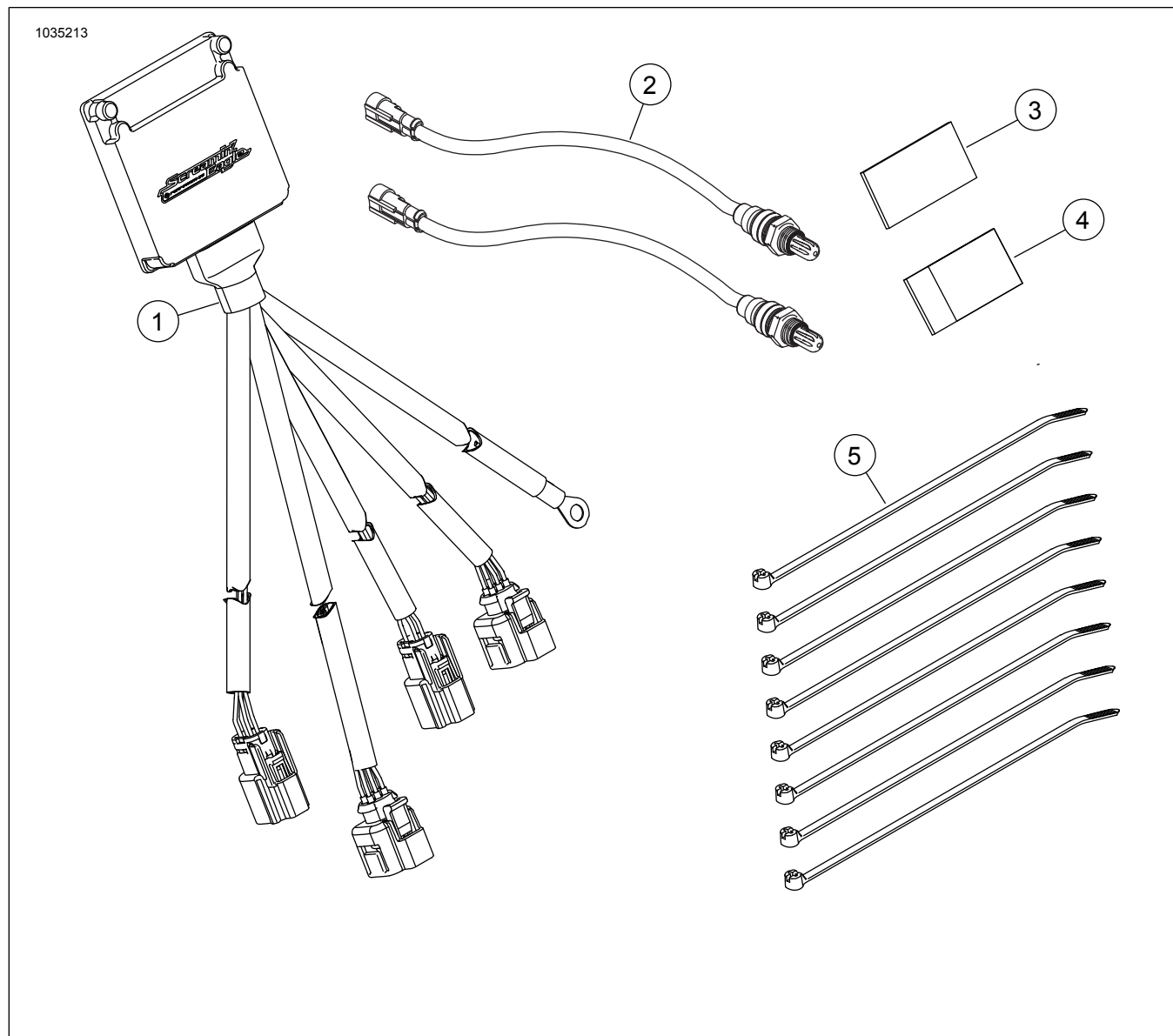


Figure 52. Kit Contents: Smart Tune Pro Automatic Tuning Module (ATM) Kit

Table 5. Kit Contents: Smart Tune Pro Automatic Tuning Module (ATM) Kit

Verify that all contents are present in the kit before installing or removing items from vehicle.					
<input checked="" type="checkbox"/>	Item	Qty	Description	Part No.	Notes
<input type="checkbox"/>	1	1	Wideband Oxygen Control Module Assembly	41000445	
<input type="checkbox"/>	2	2	Oxygen sensor, wideband	32700098	
<input type="checkbox"/>	3	1	CARB E.O. Label	Not sold separately	
<input type="checkbox"/>	4	2	Dual lock fastener	Not sold separately	
<input type="checkbox"/>	5	8	Cable strap	Not sold separately	



- | | |
|---|---|
| 1. Front oxygen sensor connector (Long) | 4. Rear oxygen sensor connector (Short) |
| 2. Ground wire | 5. Rear oxygen sensor to ECU (Black) |
| 3. Front oxygen sensor to ECU (Grey) | |

Figure 53. Defined Wire Harness Connectors