INSTRUCTIONS

-J01863 REV. 4-7-00

Kit Number 29491-99B

SCREAMIN' EAGLE TWIN CAM 88 BIG BORE (1550) CONVERSION AND (EFI) STAGE 1 KIT

General

This kit is designed for installation on Harley-Davidson Twin Cam 88 motorcycles equipped with EFI.

Installation of this kit by an authorized Harley-Davidson Dealer will not impact your limited vehicle warranty. See your Dealer for more details.

See Service Parts Page for kit contents.

NOTE

A Service Manual for your motorcycle is available at your Harley-Davidson Dealership.

⚠WARNING

This kit will allow the engine to power the motorcycle faster than the original equipment engine. Motorcycle stability decreases as speed increases. Therefore, do not exceed the following speeds on Electraglide models:
-80 mph with passengers or cargo,
-90 mph solo.
Exceeding these limits will decrease stability which may lead to loss of control and death or serious injury.

CAUTION

Improper installation of this kit may result in severe engine damage. Follow the procedures listed in this Instruction Sheet and in the appropriate Service Manual. If the procedures are not within your capabilities, or if you do not have the correct tools, have your Harley-Davidson dealer perform the installation.

Installation of this kit is divided into 4 steps:

1. Big Bore Cylinder and Piston Conversion.
2. High Performance Clutch Diaphragm Spring.
3. Calibrate the ECM.
4. High Performance Air Cleaner.

CAUTION

This kit alters the engine emission values and places the motorcycle in a different EPA engine family category. A new EPA label, provided with this kit, states specifications for the new configuration and must be affixed over the original EPA label in order to satisfy emission requirements. In addition, please read, sign and return the Screamin' Eagle Conversion Registration Form provided with these instructions to Harley-Davidson Motor Company.

CAUTION

This Big Bore Conversion and Stage 1 kit is intended for High Performance applications only. This engine related performance part is legal for sale or use in California on pollution controlled motor vehicles. Engine related performance parts are intended for the experienced rider only.

CAUTION

The air cleaner and cartridge contained in these kits are designed to perform with this kit only. Any other combination of components is not confirmed to be legal for street use.

NOTE

The Product Information Label contained in this kit is required in the state of California only. This label is required to aid in passing the California Smog Check Program. Place the Information Label on the right side of the frame directly beneath the VIN sticker. Do not place the label on motorcycles other than those specified in the Instruction Sheet.

INSTALLATION

CAUTION

Head gaskets provided in the 1550 conversion kit eliminate the need for original O-rings (Part No. 11273). For this reason, DO NOT reinstall the two O.E. (original) headgasket O-rings on top of cylinder dowels or severe engine damage may occur.

1) BIG BORE CYLINDER AND PISTON CONVERSION

1. **Disassembly -** Refer to the ENGINE section of the appropriate Service Manual to remove cylinder heads, cylinders and pistons.

2. **Assembly -** Refer to the ENGINE section of the appropriate Service Manual for installing pistons, cylinders and cylinder heads.

2) HIGH PERFORMANCE CLUTCH DIAPHRAGM SPRING

1. **Disassembly -** Refer to the DRIVE section of the appropriate Service Manual to remove primary chaincase, chain, diaphragm spring retainer and diaphragm spring.

2. **Assembly -** Refer to the DRIVE section of the appropriate Service Manual for installing diaphragm spring retainer, diaphragm spring, chain and primary chaincase.

3) CALIBRATE THE ECM

NOTE

A cartridge is available from your dealer for returning the ECM to original factory calibration from Stage 1 or Stage 2.

1. See Figure 1. Push data link connector up to disengage from T-stud.

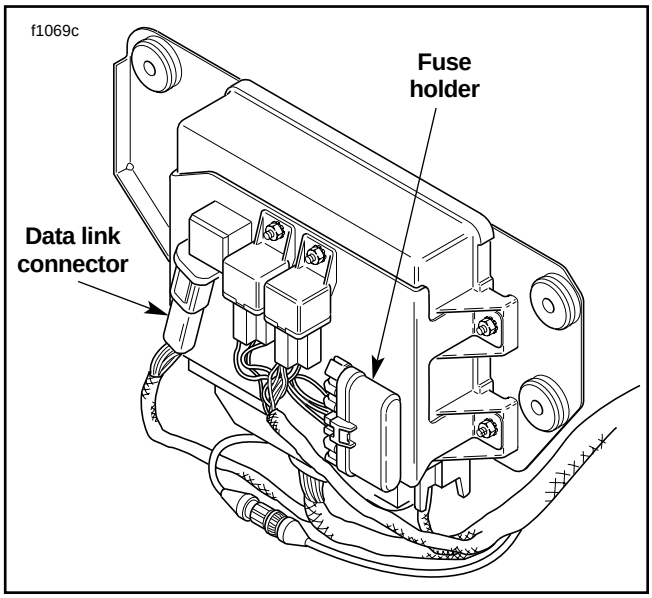


Figure 1. Data Link Connector

2. Remove rubber protective plug from open end of data link connector.
3. Plug the Scanalyzer (HD-41325) into the data link connector.
4. Turn the Ignition Switch to ON.
5. Insert the calibration cartridge from kit into the Scanalyzer.
6. Follow the flowchart on page 3 to recalibrate the ECM.
7. After returning to the main menu at the bottom of the flowchart, turn ignition OFF, and remove calibration cartridge.

4) HIGH PERFORMANCE AIR CLEANER

Removing Stock Air Cleaner

NOTE

Refer to the applicable Service Manual and check the warm-slow idle speed adjustment before removing stock backplate.

1. Remove stock backplate following the instructions given in the appropriate Service Manual.
2. See Service Parts Illustration. Retain stock air cleaner cover and buttonhead screw and washer.

Installing High Performance Air Cleaner

⚠WARNING

Using this kit with an air cleaner cover other than recommended below could lead to failure of element faceplate. The element in this kit is specifically designed for use with the OE (original equipment) cover. The kit may be used in conjunction with other H-D accessory covers provided the appropriate adapter recommended in those kits are used. If the element faceplate fails the cover could detach possibly distracting the rider which could result in death or serious injury.

NOTE

See Air Cleaner Service Parts page. When installing replacement air cleaner, apply Loctite 243 (blue), to all fasteners (both male and female).

1. See Service Parts illustration. Place one large I.D. washer (13) over each banjo bolt (12) and insert bolts through holes in mounting bracket (10). Place a second large I.D. washer (13) over each bolt. Place breather manifold (5) over bolts with hose fitting on manifold toward rear of motorcycle. Place remaining small I.D. washers (3) over ends of breather bolts.
2. Holding assembly together, insert banjo bolts into tapped holes in cylinder heads. Tighten each bolt a little at a time until assembly is held loosely in place.
3. Assemble nipple (14) to threaded hole in backplate (6). **Do not over-tighten**.
4. Peel protective strip off gasket (11) and place adhesive side against backplate. Position gasket carefully before firmly pressing gasket into place.
5. Attach rubber oil hose to nipple (14) and secure with worm drive clamp.
6. Start four 1/4-20 studs (8) to fasten backplate (6) to induction module. Do not tighten.
7. Start two 1/4-20 flathead screws (1) to fasten backplate (6) to mounting bracket (10). Do not tighten.
8. Tighten studs (8) securing backplate to face of throttle body to 55-60 **in.-lbs**.
9. Tighten flathead screws (1) securing backplate to mounting bracket (10) to 55-60 **in.-lbs**.
10. Tighten banjo bolts securing backplate bracket to cylinder heads to 140-145 **in.-lbs**.
11. Attach loose end of rubber oil hose to hose fitting on breather manifold (5) and secure with worm drive clamp.

NOTE

Crankcase ventilation is critical for proper oil system operation. It may be necessary to trim the length of the rubber oil hose to ensure that the hose is not kinked. If the hose appears kinked after installation, remove the hose, trim it to an appropriate length and reinstall as described in Step 11.

12. Place the air cleaner element (7) on the backplate with the rubber portion against the backplate. Secure air cleaner with four 1/4-20 buttonhead screws (2). Tighten screws to 55-60 **in.-lbs**.

13. Install air cleaner cover.

Setting Idle Speed

Warm-Slow Idle Speed Adjustment

1. Remove air cleaner cover.

2. Start vehicle and run until both engine and oil are fully warm. Using the Scanalyzer, verify that engine temperature is above 284º F. (140º C.). This step is very important or adjustment will be incorrect.

CAUTION

To ensure proper charging at idle, maintain an idle speed of approximately 950-1050 RPM. Insufficient idle speed may drain the battery in excessive idle situations, resulting in insufficient voltage to the ECM, ignition coil and fuel pump (which can result in a variety of operating problems).

3. To adjust the warm-slow idle speed, locate the set screw through the hole in the air cleaner backplate (lower right corner of the intake air inlet). See Figure 2.

NOTE

For best results, use the Scanalyzer (HD-41325) or an external tachometer with an inductive pickup.

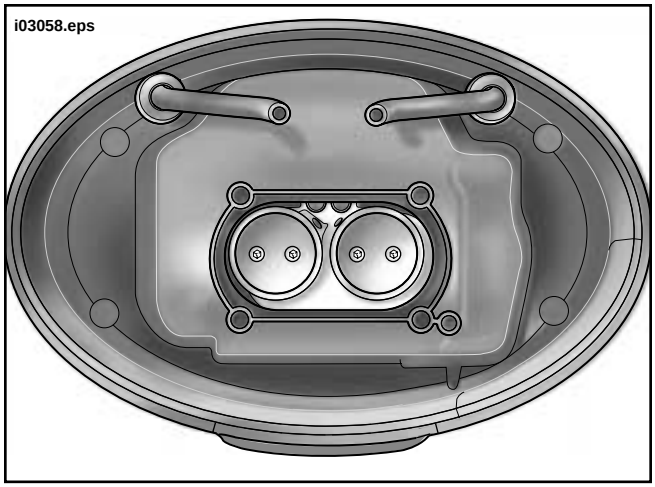


Figure 2. Air Cleaner Backplate

4. Using a T10 TORX drive head, turn the set screw clockwise to increase OR counter-clockwise to decrease idle speed.

5. When idle speed is set, turn the Ignition/Light key Switch to OFF.

6. Install air cleaner.

NOTE

Installation of air cleaner cover may affect idle speed.

7. Following the final idle speed adjustment, disconnect Scanalyzer and then remove both 5 amp and 15 amp fuses (ECM power and fuel pump) for 15 minutes. This step is necessary to clear the ECM memory of the previously learned minimum throttle position.

8. Verify correct idle speed after installing air cleaner assembly. Repeat adjustment procedure, if necessary.

Cold Idle Speed Adjustment

NOTE

All sensors and actuators must be in proper working order and the engine must be in good condition in order for this procedure to have correct and consistent results.

1. Start vehicle and run until engine, primary case and transmission are fully warmed up. Using Scanalyzer, verify that engine temperature is above 284º F. (140º C.). Shut off engine.

2. Remove air cleaner and backplate assembly. Unplug wire harness connector from idle speed control actuator.

3. Start and run engine until idle speed has stabilized, approximately one minute.

4. Using a T10 TORX drive head, turn the cold idle speed set screw until engine speed is 1500-1600 RPM. See Figure 3. Be sure not to move the idle speed lever while turning the screw.

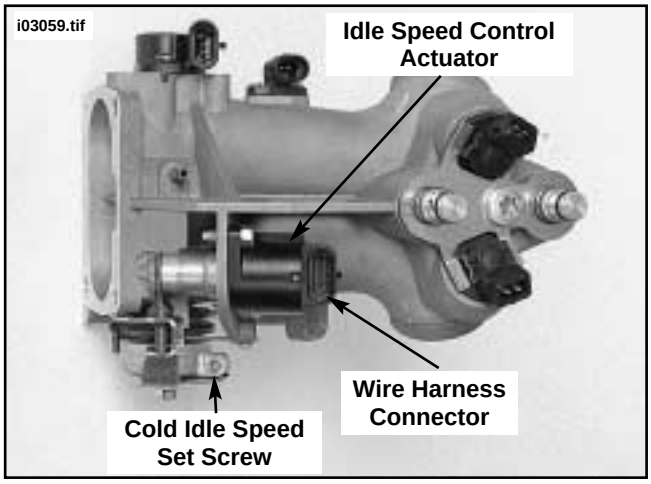


Figure 3. Induction Module (Top View)

5. Reconnect wire harness connector to idle speed control actuator.

7. Shut off engine and wait approximately 10 seconds.

8. Install air cleaner and backplate assembly.

Air Cleaner Maintenance

NOTE

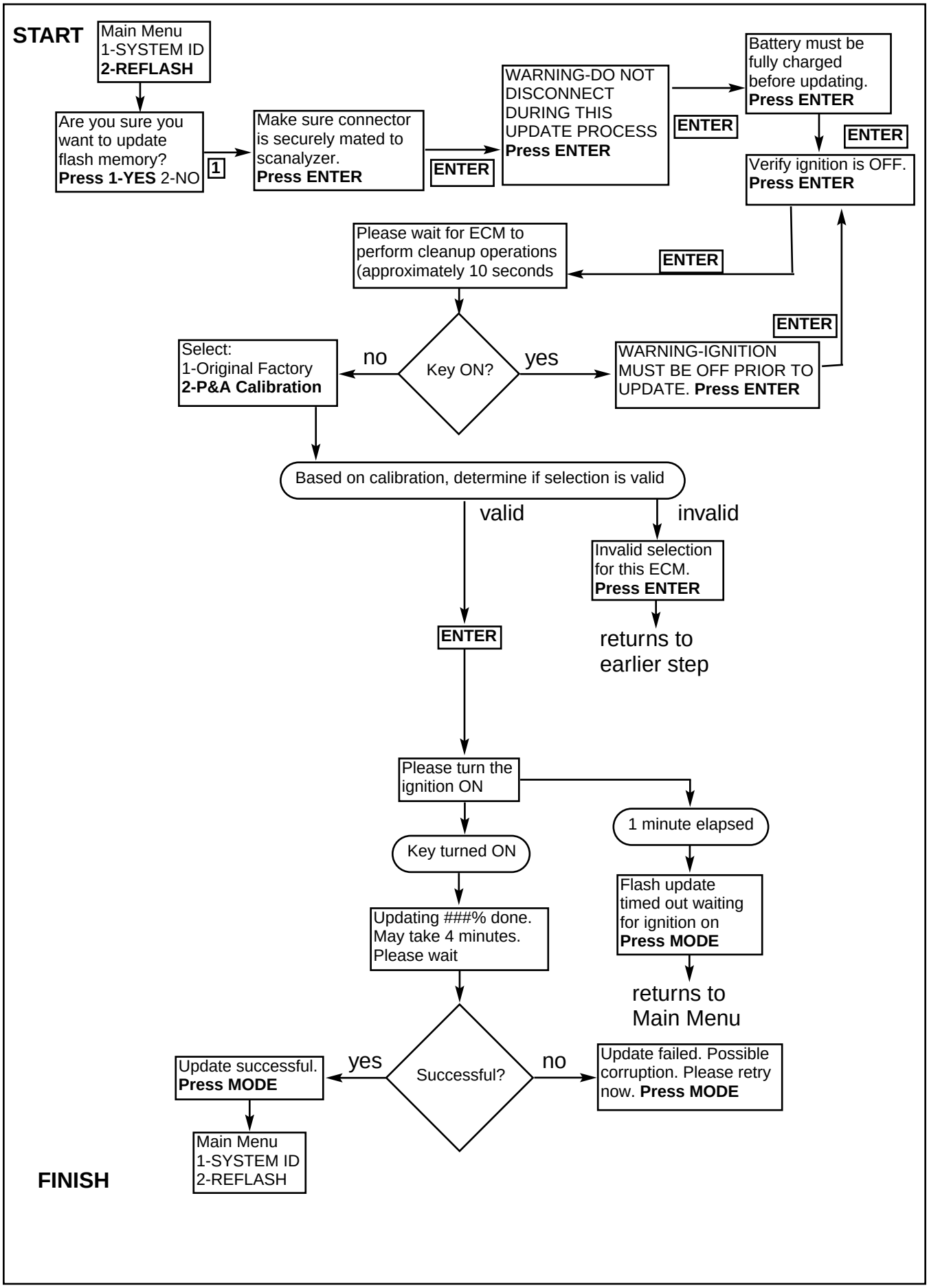
See Air Cleaner Service Parts page. Whenever air cleaner maintenance is performed, apply Loctite 243 (blue) to all fasteners (both male and female).

1. Remove air cleaner cover and inspect element every 5000 miles, or more often under dusty conditions.

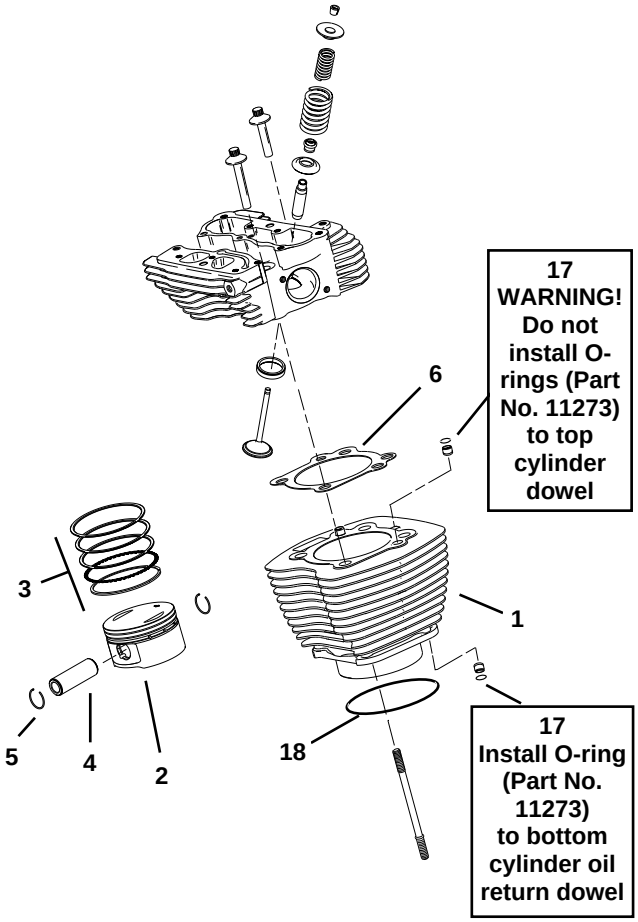
2. To clean element, remove and wash by rolling it, on edge, in a shallow pan containing enough Air Cleaner/Degreaser, Part No. 99883-88T to cover no more than 3/4 the depth of filter pleats. Do not let dirty solution get inside element.

3. Remove element from cleaner/degreaser and allow five minutes for cleaner to dissolve dirt. From the inside out, rinse the element with cold water. Shake and allow to air dry. Do not dry with compressed air.

4. Re-oil element using Air Cleaner Oil, Part No.99882-88T. Apply along the full length of each pleat and allow to set until the element is a uniform color. Allow excess oil to drain. Install element and cover.


START
Main Menu
1-SYSTEM ID
2-REFLASH
Are you sure you want to update flash memory?
Press 1-YES 2-NO
1
Make sure connector is securely mated to scanalyzer.
Press ENTER
ENTER
WARNING-DO NOT DISCONNECT DURING THIS UPDATE PROCESS
Press ENTER
ENTER
Battery must be fully charged before updating.
Press ENTER
ENTER
Verify ignition is OFF.
Press ENTER
ENTER
Please wait for ECM to perform cleanup operations (approximately 10 seconds
Key ON?
no
yes
Select:
1-Original Factory
2-P&A Calibration
WARNING-IGNITION MUST BE OFF PRIOR TO UPDATE. Press ENTER
ENTER
Based on calibration, determine if selection is valid
valid
invalid
Invalid selection for this ECM.
Press ENTER
returns to earlier step
ENTER
Please turn the ignition ON
Key turned ON
1 minute elapsed
Updating ###% done.
May take 4 minutes.
Please wait
Flash update timed out waiting for ignition on
Press MODE
returns to Main Menu
Successful?
yes
no
Update successful.
Press MODE
Update failed. Possible corruption. Please retry now. Press MODE
Main Menu
1-SYSTEM ID
2-REFLASH
FINISH

io1333-.eps



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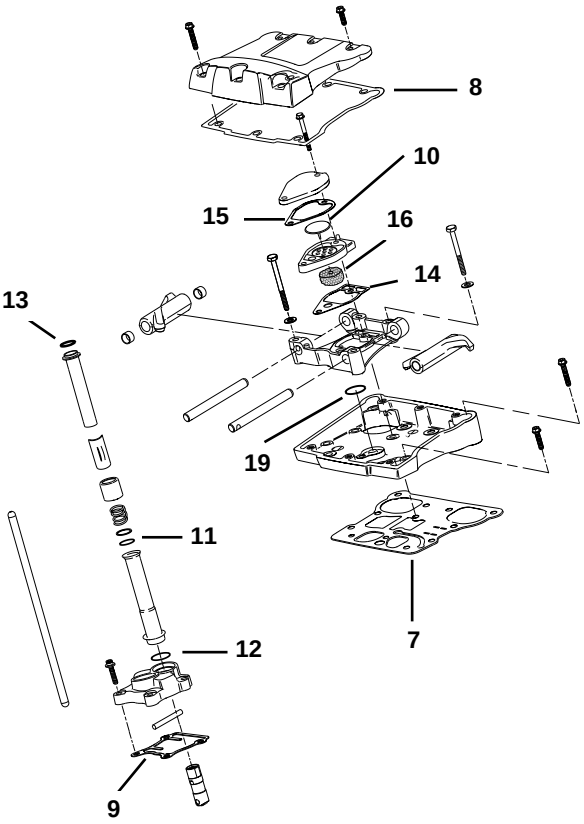

Item	Description	Part No.
1	1550 Cylinder assy (Black) (2)	16547-99
2	1550 Piston (2)	22114-99
3	1550 Piston ring set (2))	21918-99
4	Piston pin (2)	22132-99
5	Piston pin circlip (4)	22097-99
6	1550 Head gasket (2)	16787-99
7	Gasket, rocker cover base (2)	16719-99
8	Gasket, rocker cover top (2)	17386-99
9	Gasket, Tappet cover (2)	18635-99
10	Valve, umbrella (2)	26858-99
11	O-ring, middle push rod cover (4)	11132
12	O-ring, lower push rod cover (4)	11145
13	O-ring, upper push rod cover (4)	11293
14	Gasket, breather baffle (2)	17592-99

Item	Description	Part No.
15	Gasket, breather cover (2)	17591-99
16	Filter element, breather (2)	63815-99
17	O-ring, cyl deck ring dowel (2)	11273
18	O-ring, cyl spigot (2)	11256
19	O-ring, rocker arm support (2)	11270
20	Seal, exhaust (2) (not shown)	65324-83A
21	Seal, intake manifold/EFI module (2) (not shown)	26468-00
22	Valve seal kit (1) (not shown)	18004-86
23	Clutch, spring (not shown)	37951-98
24	Flanges, front and rear seal (not shown)	Kit P/N 28020-00

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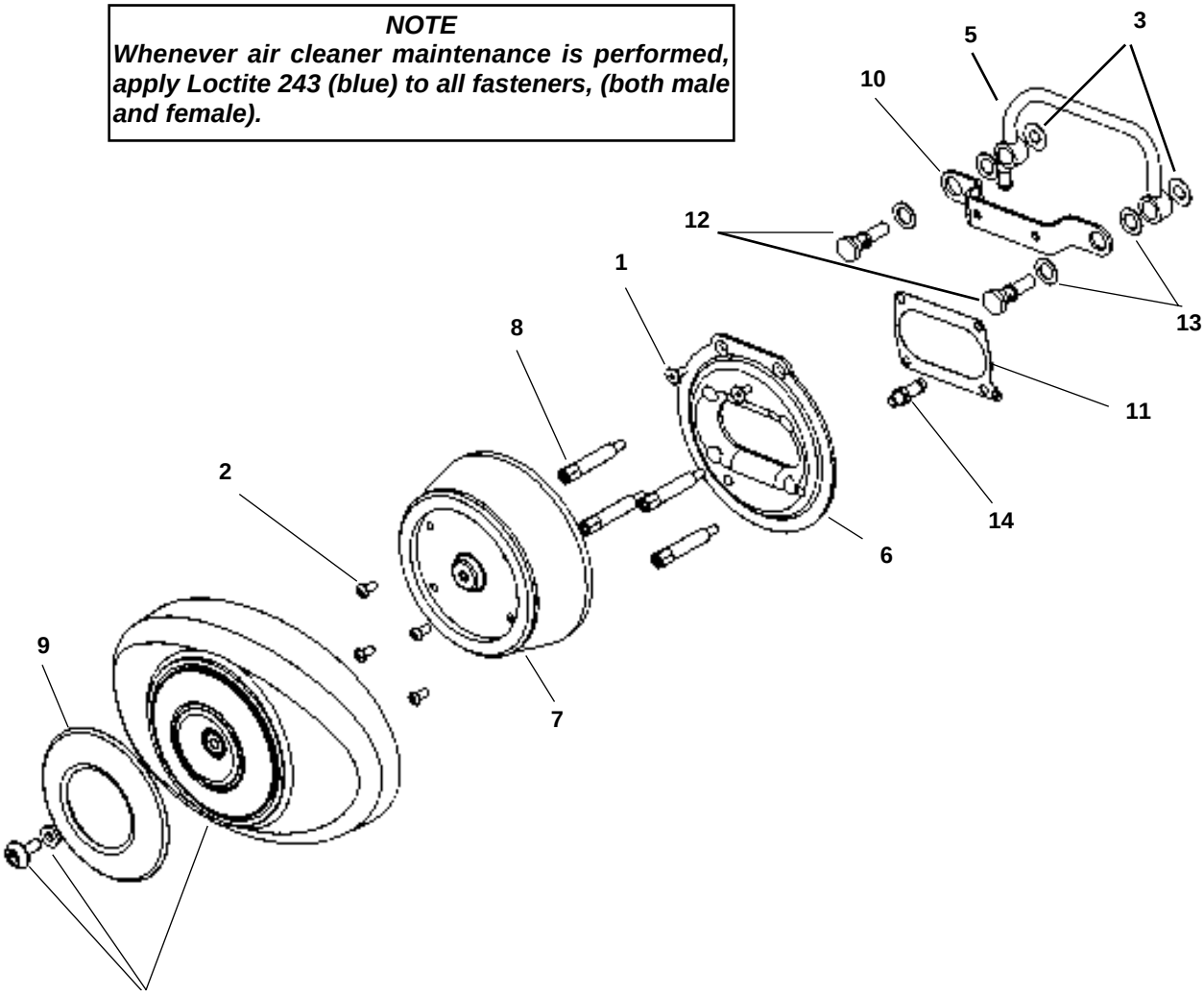
NOTE
Whenever air cleaner maintenance is performed, apply Loctite 243 (blue) to all fasteners, (both male and female).



Original screw, washer, and air cleaner cover

Item	Description	Part No.
1	Flathead screws (2), 1/4-20 x 5/8 in. long	3793A
2	Buttonhead screws (4) 1/4-20 x 3/8 in. long	3652
3	Washers (2), small I.D.	46465-99
4	Worm drive clamp, not shown (2)	9946
5	Breather manifold	27900-97
6	Backplate, EFI	29444-99
7	Filter element	29446-99A
8	Studs, 1/4-20 (4)	29447-99
9	Air cleaner insert	29450-99
10	Mounting bracket	29452-99

Item	Description	Part No.
11	Gasket	29617-99
12	Banjo bolts (2)	45507-99
13	Washers (4), large I.D.	45596-93
14	Nipple	63533-41A
15	Rubber oil hose, 3/8 in. ID (not shown)	63534-90
16	1550 Cartridge, ECM calibration (not shown)	32710-99A
17	Label, EPA Emissions (not shown)	not sold
18	Label, Product Information 1550 EFI Stage 1 (not shown)	not sold
19	Loctite 243, blue (.5 ml) (not shown)	not sold

SCREAMIN' EAGLE REGISTRATION FORM

Your Harley-Davidson vehicle, VIN number_____, has now undergone conversion to one of the following specifications:

❑ 1450 cc. EFI Stage 1 configuration

❑ 1550 cc. EFI Stage 1 configuration

The conversion of your Harley-Davidson vehicle to this specification is performed under an allowance made with The United States Environmental Protection Agency. We are required under this allowance to document this conversion, and notify the EPA regarding the volume of vehicles converted on an annual basis. We have been asked to document this process because the alteration of Original Equipment emissions-related components is carefully monitored by The Environmental Protection Agency. This alteration of your vehicle has placed it in a different EPA engine specification category and a new EPA emissions label will be affixed to your vehicle by the dealer to reflect this change.

Please note that this conversion is performed with the complete approval of the EPA, but any further unauthorized alterations of the emissions related components in this configuration could constitute tampering under EPA guidelines and lead to substantial fines and penalties. THESE CONVERSIONS ARE NOT CURRENTLY APPROVED FOR USE OR SALE IN THE STATE OF CALIFORNIA. Please seek the advice of your dealer when considering any change to emissions-related components on your vehicle. In general, there are two appropriate types of conversions that are allowable:

1. Those that are fully approved by The EPA through an Executive Order or other allowance, such as your present conversion.
2. Conversions that are permissible for off-road/racing applications only.

Many Screamin' Eagle performance items fall under this second category.

ACKNOWLEDGEMENT:

I, the undersigned, acknowledge that I have authorized the conversion of my 1450 cc EFI vehicle to the specification checked above. I realize that the purpose of this procedure is to document this conversion for record-keeping used by Harley-Davidson Motor Co. and the United States Environmental Protection Agency.

Owner Signature _____

Owner Address _____

Dealer Signature _____

Dealer Stamp _____

Date of completed conversion: _____

P&A Department Representative _____

Date Received: _____

Dealer: Please return this document to Barb Allan at the Parts and Accessories Division, Dept. 641 Harley-Davidson Motor Company, 3700 W. Juneau Avenue P.O. Box 653, Milwaukee Wisconsin, 53201-0653