

Service Tool Instructions



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Instruction Sheet ID: -J02845

HD-46247A VEHICLE ALIGNMENT TOOL

General

See Figure 1. Vehicle Alignment Tool (HD-46247A) is used to align the powertrain to the frame after major disassembly or engine replacement. It is designed for 1993 and later Touring models.

NOTE

A service manual for your motorcycle is available from your Harley-Davidson dealer.



Figure 1. Vehicle Alignment Tool (HD-46247A).

Procedure

WARNING

Check vehicle alignment according to following procedures. Incorrect alignment can adversely affect stability and handling, which could result in death or serious injury. (00287a)

NOTE

See Service Tool Parts at the end of this document.

- 1. Place the motorcycle on a hydraulic center stand or place blocking under the frame to support the vehicle and lift the rear wheel off the ground. Be sure the motocycle is positioned as level as possible.
- Remove socket screw with lockwasher to remove left passenger footboard from rear swingarm bracket. Tighten both rear swingarm bracket bolts to 34-42 ft-lbs (46-57 Nm). Repeat step on right side of motorcyle.
- 3. Remove the decorative chrome plug from both rear swingarm brackets.
- 4. Tighten pivot shaft nut(s) as follows:
 - a. On 2002 and later models, hold left side pivot shaft locknut and tighten right side locknut to 40-45 ft-lbs (54-61 Nm). Then hold right side

pivot shaft locknut and tighten left side locknut to 40-45 ft-lbs (54-61 Nm).

- b. On 1993-2001 models, hold pivot shaft weld nut and tighten opposite side locknut to 40-45 ft-lbs (54-61 Nm). As the pivot shaft is usually inserted from the right side of the motorcycle, the weld nut will normally be found at that end.
- 5. Check belt deflection and axle nut torque:
 - a. On 2002 and later models, verify belt deflection is within specification and adjuster cams are tight against rear swingarm weld nuts. Hold weld nut on left side of axle and tighten cone nut on right side to 95-105 ft-lbs (128.8-142.4 Nm).
 - b. On 1993-2001 models, refer to Vehicle Alignment in the service manual. Use alignment tool made from welding rod to check that rear axle is parallel to pivot shaft. Adjust axle adjusters if necessary and verify belt deflection is within specification. Hold weld nut on right side of axle and tighten nut on left side to 60-65 ft-lbs (81.3-88.1 Nm).
- 6. Remove seat. See the service manual.
- 7. Partially remove fuel tank to gain access to top engine mounting bracket and stabilizer link. See the service manual.
- 8. Top engine mount:
 - a. See Figure 2. On left side of motocycle, tighten the two top engine mounting bracket to front and rear cylinder head bolts to 35-40 ft-lbs (48-54 Nm).
 - See Figure 3. On the right side of the motorcyle, tighten the top stabilizer link eyelet to frame weldment bolt to 18-22 ft-lbs (24-30 Nm).
 - c. Loosen both top stabilizer link jam nuts.
 - d. See Figure 2. Remove the top stabilizer link eyelet to top engine mounting bracket bolt.



Figure 2. Top stabilizer link and engine mounting bracket (left side).



Figure 3. Top stabilizer link and engine mounting bracket (right side).



Figure 4. Front stabilizer link and engine mounting bracket.

- 9. Front engine mount:
 - Remove flange locknuts from studs on lower frame crossmember. Remove voltage regulator from studs and allow to hang by cables at front of motorcycle.
 - See Figure 4. Tighten two engine to front engine mounting bracket bolts to 33-38 flt-lbs (45-52 Nm) on 1993-2006 models, and to 36-40 ft-lbs (49-54 Nm) on 2007 models.
 - c. See Figure 4. Tighten front stabilizer link eyelet to front engine mounting bracket bolt to 18-22 ft-lbs (24-30 Nm).
 - d. Loosen both front stabilizer link jam nuts.
 - e. See Figure 4. Remove front stabilizer link eyelet to frame weldment bolt.
 - f. See Figure 4. Remove the front engine mounting bracket to rubber mount bolt (with large and small flat washers and hex nut).
- 10. Using Vehicle Alignment Tool (HD-46247A):
 - a. Install alignment screws and pilots in alignment fixtures.
 - i. See Figure 5. Select the correct alignment fixtures. The 2007 and later Touring model motorcycles use different alignment fixtures than 1993-2006 models.
 - See Figure 6. Select the correct alignment ii. screws. On 1993-2001 models, one end of the pivot shaft has a weld nut instead of a locknut. The weld nut requires a special alignment screw (HD-46247-3) with a larger cup. While the weld nut is normally on the right side of the motorcycle, the pivot shaft can be installed with the weld nut on the left side. Therefore, veify location of weld nut and install the special alignment screw in pilot of appropriate alignment fixture (whether left or right). On 2002 and later models, the locknut type alignment screws are used in the pilots of both alignment fixtures.
 - b. Back off alignment screws and pilots so that no contact is made with pivot shaft during initial installation.
 - c. Position alignment fixture so that pilot begins to engage hole in rear swingarm bracket and then start 5/16 inch allen head screw (with flat washer) into lower hole of passenger footboard mount. Leave fixture loosely installed. Repeat step on other side of motorcycle.

NOTE

Alignment fixtures are stamped L(eft) and R(ight) for easy identification. Reliefs allow the right side fixture to be installed without removing the hex screws to the brake hose and exhaust valve actuator cable (HDI) P-clamps.

- d. Holding alignment fixture tight against rear swingarm bracket, use knurling to rotate pilot until it bottoms in rear swingarm bracket. Without disturbing setting of pilot, tighten allen head screw to passenger footboard mount to 18-22 ft-lbs (24-30 Nm). Repeat step on other side of motocycle.
- e. Hand turn alignment screw until it bottoms against end of pivot shaft. Repeat step on other side of motorcycle.
- f. Tighten alignment screw to 60-80 ft-lbs (6.8-9.0 Nm). Repeat step on other side of motorcycle.



Figure 5. Select alignment fixtures.



Figure 6. Select alignment screw type.

- 11. Adjust each stabilizer link as follows:
 - a. See Figure 1 and Figure 3. Install bolts removed

under steps 8(d) and 9(e), and using the center hex to maintain equal thread engagement at both eyelets, adjust stabilizer links so that bolts thread in without any stress or engine movement.

- b. Alternately tighten bolts to 18-22 ft-lbs (24-30 Nm).
- Holding the stabilizer link adjuster and mounting eyelets to prevent movement or binding, tighten jam nuts on top and front stabilizer links.
- 12. Remove vehicle alignment tool from rear swingarm brackets.
- 13. Snap the chrome plugs back into the rear swingarm brackets.
- 14. Install socket screw with lockwasher to fasten passenger footboard to rear swingarm bracket. Tighten screw to 30-35 ft-lbs (40.7-47.5 Nm). Repeat step on other side of motorcycle.
- 15. Verify that front rubber mount is centered under the front engine mounting bracket bolt hole and is free of binding.
 - a. If the front rubber mount passes inspection, proceed as follows:
 - See Figure 4. Tighten the two front rubber mount to frame crossmember bolts to 15-20 ft-lbs (20-27 Nm).
 - See Figure 4. Install front engine mounting bracket to rubber mount bolt (with large and small flat washers and hex nut) and tighten to 15-20 ft-lbs (20-27 Nm).
 - b. If centering or relaxation of the mount is required, proceed as follows:
 - i. See Figure 4. Loosen the two front rubber mount to frame crossmember bolts.
 - ii. Push on front rubber mount to center it under the bolt hole in the front engine mounting bracket. Bounce or wiggle the engine if necessary to unload the front rubber mount and prevent binding.
 - See Figure 4. Tighten the two front ruber mount to frame crossmember bolts to 15-20 ft-lbs (20-27 Nm).
 - iv. See Figure 4. Install front engine mounting bracket to rubber mount bolt (with large and small flat washers and hex nut) and tighten to 15-20 ft-lbs (20-27 Nm).
- Slide voltage regulator over studs on lower frame crossmember at front of vehicle. Install flange locknuts on studs and tighten to 70-100 ft-lbs (7.9-11.3 Nm).
- 17. Install fuel tank. See the service manual.

- 18. Install seat. See the service manual.
- 19. Test ride the motorcycle. If the test ride indicates possible vehicle misalignment or clearance problems, see the service manual.



Figure 7. Install vehicle alignment tool (left side).

SMOTOR72 HARLEY-DAVIDSON	Service Tool Parts	Part No. HD-46247A
	Vehicle Alignment Tool	Date 10/2017
Item 1. 2. 3. 4. 5. 6.	Description Alignment screw, weld nut (1993-2001) Alignment fixture, right side (1993-2006) Alignment screw, locknut (2002 and later) Pilot Screw, 5/16-16 x 1.5 inch Washer Alignment fixture, left side (1993-2006) Alignment screw, locknut (2002 and later) Pilot Alignment fixture, left side (2007)	Qty.Part No.1HD-46247-31HD-46247-2112*109842*RS-13500-1801HD-46247-1111HD-46247-7
7. *Bosc	Alignment fixture, right side (2007) h Part No.	1 HD-46247-8