



# INSTRUCTIONS

-J01118

REV. 3-1-93

Kit Number 40110-89

## BELT DRIVE KIT

### General

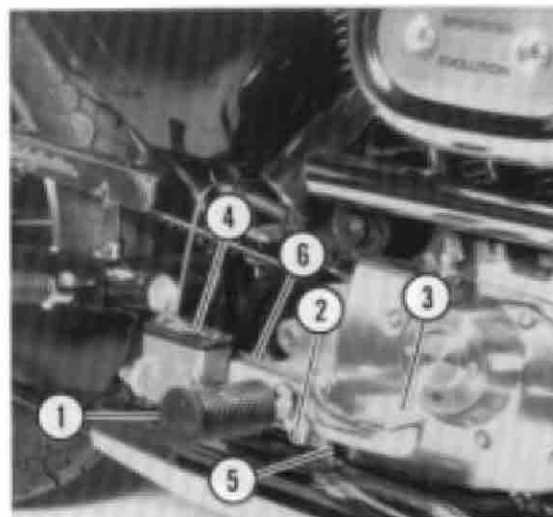
This kit is designed for installation on 1986 to 1990 XLH model vehicles with 4-speed transmission and chain-drive original equipment. We recommend that this kit be installed by your authorized Harley-Davidson dealer.

### QTY DESCRIPTION

|   |  |
|---|--|
| 1 | Plug, hole, 1/4 in.                        |
| 1 | Screw, hex socket, 10-24 x 3/8 in.         |
| 1 | Screw, hex socket, 5/16-18 x 4 in.         |
| 2 | Screw, button head, 10-32 x 1/2 in.        |
| 1 | Screw, self-tapping                        |
| 5 | Screw, hex cap, 7/16-14 x 1-1/2 in.        |
| 1 | Screw, hex cap, 3/8-16 x 2-1/2 in.         |
| 1 | Washer, flat, 1-1/8 in. O.D.               |
| 2 | Washer, flat, #10                          |
| 2 | Lockwasher, split, #10                     |
| 1 | Lockwasher, external tooth, #10            |
| 2 | Nut, acorn, #10-32                         |
| 2 | Locknut, hex, #10-32                       |
| 1 | Nut, hex, 5/16-18                          |
| 1 | Nut, hex jam, 3/4-16                       |
| 1 | Cover, transmission sprocket               |
| 1 | Belt, secondary                            |
| 1 | Sprocket, transmission                     |
| 1 | Sprocket, wheel                            |
| 1 | Cover, wheel sprocket                      |
| 1 | Clamp                                      |
| 1 | Guard, belt                                |
| 1 | Support, belt guard (early)                |
| 1 | Support, belt guard (late, flat on bottom) |
| 1 | Plate, mounting                            |
| 1 | Deflector, debris                          |
| 1 | Washer, flat, 37/64 O.D.                   |
| 1 | U-bolt                                     |
| 1 | Tool, counterbore                          |
| 1 | Loctite, 271                               |
| 1 | Cotter pin, 1/16 x 3/4 in.                 |
| 1 | Cotter pin, 5/32 x 1-1/2 in.               |
| 1 | Lockwasher, split, 5/16 in.                |
| 1 | Washer, flat, 7/8 in. O.D.                 |
| 5 | Washer, flat, 7/16 I.D.                    |

### Removal/Disassembly

1. Place vehicle on center stand or raise vehicle with suitable blocking under frame, so rear wheel is raised off of floor several inches.
2. Remove exhaust shields.
3. Remove nuts, lockwashers from cylinder head exhaust studs.



- |                |                    |
|----------------|--------------------|
| 1. Footrest    | 4. Master cylinder |
| 2. Clevis pin  | 5. Nut             |
| 3. Brake pedal | 6. Stiffener       |

Figure 1. Brake Pedal Removal

4. See Figure 1. Remove right footrest (1) at rear brake pivot.

### NOTE

On 1986 and early 1987 vehicles, the brake foot pedal can be slid off the brake pivot without having to disconnect the clevis pin.

5. Remove brake pedal retaining ring. Remove and discard cotter pin from brake linkage clevis pin (2); remove clevis pin. Remove brake pedal (3). Remove bolts from brake master cylinder (4). Move master cylinder out of the way, leaving brake line attached.
6. Remove nut (5) from the stud which attaches exhaust bracket to sprocket cover.
7. See Figure 2. Remove the bolts, nuts and washers which secure muffler to muffler support bracket (1). Remove exhaust system.
8. Remove Allen head screws from sprocket cover. Remove sprocket cover.
9. Remove right lower shock absorber bolt and chain guard. Save hardware from front mount of chain guard.

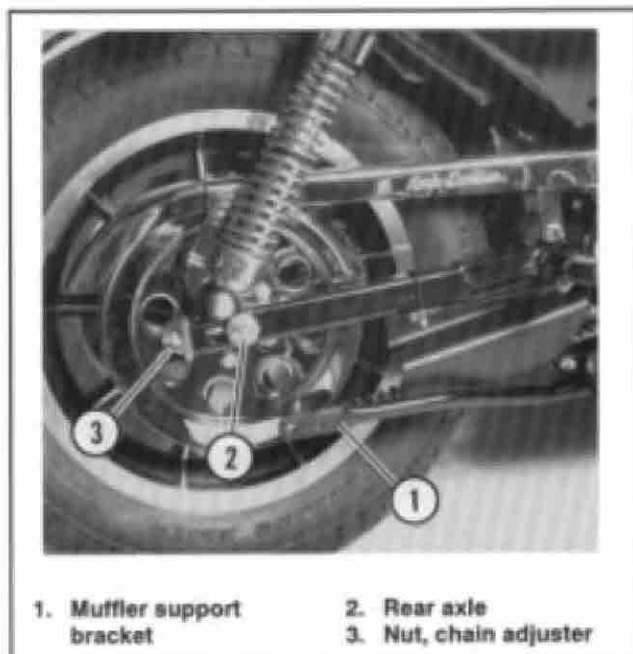


Figure 2. Chain Removal

#### NOTE

The cotter pin, which is inserted through the axle and axle nut, is found on 1989 to 1990 vehicles only.

10. Remove cotter pin, nut and washers from rear axle (2). Discard cotter pin.
11. Remove axle, drive chain and wheel assembly.
12. Remove right passenger footpeg. Remove footpeg mounting stud socket screw from tapped hole in swingarm.

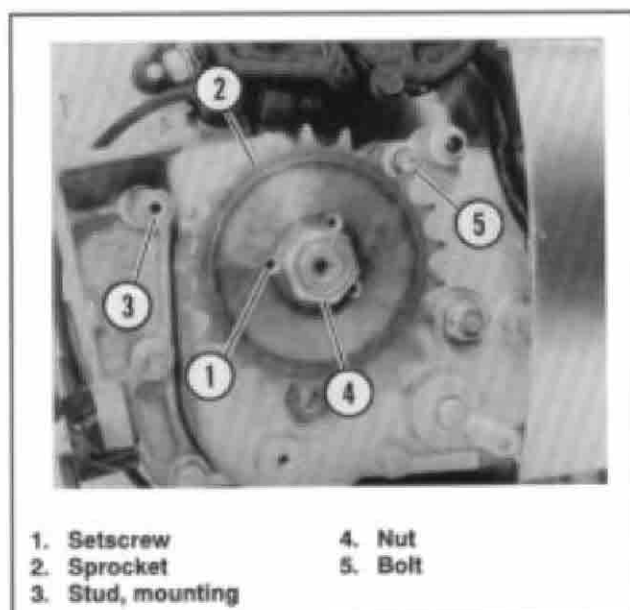


Figure 3. Sprocket Removal

13. See Figure 3. Remove transmission sprocket setscrew (1). Hold transmission shaft from rotating by placing transmission in gear, or by inserting a hardwood wedge between transmission sprocket and lower front sprocket cover stud. Remove sprocket nut (4) and transmission sprocket.

#### NOTE

Inspect splines on transmission shaft for wear. If splines are excessively worn, transmission shaft should be replaced before proceeding with installation of this kit.

14. Remove sprocket cover mounting stud (3). Install 3/8-16 x 2-1/2 in. hex cap screw with 1-1/8 in. flat washer from kit in tapped hole from which mounting stud was removed. Tighten to 22-36 ft-lbs torque.
15. Remove mounting bolt (5) from right crankcase half. Mount counterbore tool from kit securely in chuck of electric drill. Carefully counterbore hole, from which mounting bolt was removed, 3/16 in. deeper so that head of socket bolt is flush with surface. Use care when machining counterbore so depth is not exceeded. Install 5/16-18 x 4 in. hex socket screw from kit in counterbored hole. Tighten screw to 16-28 ft-lbs torque.

### Assembly/Installation- Drive Components

#### NOTE

Once Loctite 271 is applied, finish assembly without delay to prevent Loctite 271 from setting prematurely.

1. Wire brush and clean shaft splines. Apply a few drops of Loctite 271 from kit to splines of shaft and transmission belt sprocket from kit, keeping Loctite away from seal. Apply Loctite 271 to threads of shaft and to 3/4-16 hex jam nut from kit. Install sprocket on shaft with flange to the outside. Place transmission in gear (or reuse wooden block which had been used in removal/disassembly) to prevent shaft from rotating. Thread on new nut (do not use original sprocket nut) and tighten to a minimum of 65-75 ft-lbs torque. Coat threads of 10-24 x 3/8 in. hex socket screw from kit (very lightly) with Loctite 271. Install screw in one of the three tapped holes in sprocket (see Figure 4 for proper screw location). Screw must be as close as possible to the side of the hex nut corner which will prevent any counterclockwise rotation (loosening) of the nut. If screw does not quite align with the desired mounting hole, do not loosen sprocket nut. Instead, tighten the nut further to attain the proper alignment (maximum 100 ft-lbs torque). Tighten screw to 50-60 in-lbs torque.
2. Remove chain sprocket from rear wheel.

#### NOTE

Chrome flanged sprocket cover only fits on sprocket one way. Rotate cover on sprocket until all holes align.

3. Position wheel sprocket from kit, with sprocket flange toward wheel, on rear wheel. Secure sprocket and chrome wheel sprocket cover from kit to wheel with five 7/16-14 x 1-1/2 in. hex socket screws and 7/16 in. washers from kit. Tighten screws to 45-50 ft-lbs torque.

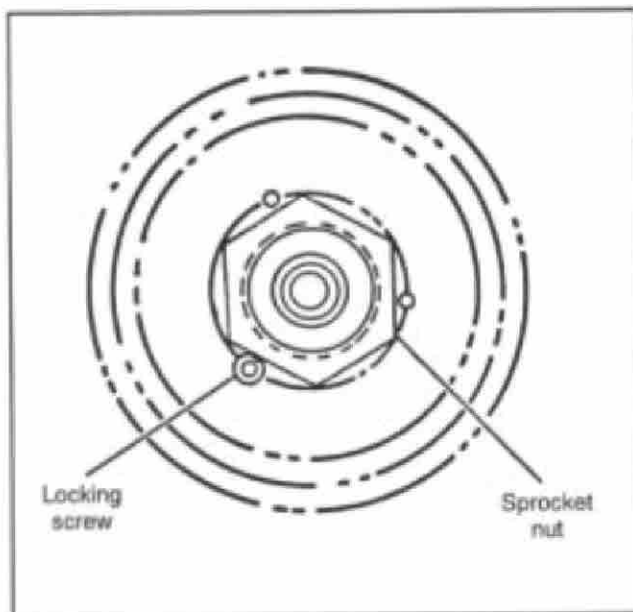


Figure 4. Securing Sprocket Nut

4. Position belt on transmission sprocket.
5. Install rear wheel, with brake disc installed to caliper and with belt installed over wheel sprocket. Be sure disc is positioned between brake pads. Apply Loctite ANTISEIZE to axle shaft. Insert axle through left side axle adjuster, rear caliper bracket, wheel, right side external spacer, and right side axle adjuster. Install original flat washer, lockwasher and nut. Verify that wheel is centered in rear fork and is aligned with transmission sprocket. Leave axle nut hand tight until belt tension adjustment is made.

### Assembly/Installation- Debris Deflector

1. See Figure 5. Place debris deflector (1) from kit in position under swingarm (2). Place plate (3) from kit under flange of deflector and align mounting holes.
2. Place U-bolt (4) from kit over top of swingarm (2), through holes in top of debris deflector (1) and through holes in plate (3).
3. Install a #10 split lockwasher (5) and #10-32 acorn nut (6) from kit over each leg of U-bolt. Tighten finger tight.
4. Position debris deflector so that hole in front mounting bracket is aligned with tapped hole in swingarm.

#### CAUTION

On all 1988 to 1990 models, and on 1987 Hugger models, the 7/8 in. flat washer (7) from kit must be installed between the debris deflector front mounting bracket and the swingarm. The washer maintains adequate clearance between tire and debris deflector.

#### WARNING

Footrest must fold up at a 45° angle (from vertical) toward rear of motorcycle. This angle allows footrest to

fold up if it accidentally strikes the ground surface when making a sharp turn. Failure to set footrest to the proper fold-up angle could result in personal injury and/or damage to the vehicle.

5. Insert original socket screw (8) through passenger footrest mounting stud (9), through debris deflector bracket, through 7/8 in flat washer (7) from kit (if required, see **CAUTION** above), and into tapped hole in swingarm. Tighten screw to 50-55 ft-lbs torque. Install passenger footrest. Position footrest to fold up at 45° angle toward rear of motorcycle.
6. Tighten acorn nuts (6) at U-bolt to 22 in-lbs torque.

### Assembly/Installation- Belt Guard

#### NOTE

On 1986 - 1987 model year vehicles which have swingarms (17) with twin mounting lugs, use rear mounting bracket (18). On all other models, use rear mounting bracket (10). Bracket (18) is shorter than bracket (10). Bracket (10) can be easily identified by the flat area at the bottom of the bracket.

1. See Figure 5. Place rear mounting bracket (18 or 10) on top of belt guard (11) and align mounting holes.
2. Attach rear mounting bracket to belt guard with two #10-32 x 1/2 in. button head screws (12), #10 flat washers (22) and #10-32 hex locknuts (23) from kit.
3. Position belt guard (11) with rear mounting bracket inboard of shock absorber mounting lug and with front bracket outboard of original chain guard mounting lug.
4. Insert original shock mounting bolt (13) through washer (19), shock absorber, mounting lug on swingarm, and belt guard rear bracket. Secure with nut (14). Tighten to 50-55 ft-lbs torque.
5. Attach front mounting bracket to front mounting lug/bracket as follows:
  - **1986 - 1987 XLH models (except 1987 Hugger):** Insert original 3/8-24 x 1 in. screw (15) through original flat washer (20), belt guard mounting bracket (11) (outboard side), 37/64 in. flat washer (21) from kit and into tapped hole in mounting lug of swingarm (17). Tighten to 33 ft-lbs torque.
  - **1988 - Early 1989 XLH models (including 1987 Hugger):** Insert original 3/8-16 x 1 in. screw (15) through original flat washer (20), belt guard mounting bracket (11) (outboard side), 37/64 in. flat washer (21) from kit, and hole in mounting lug of swingarm (2). Secure with original 3/8-16 nut. Tighten to 33 ft-lbs torque.
  - **Late 1989 - 1990 models:** Elongate (approximately 1/8 in.) bottom of hole in front mounting bracket on swingarm (2). Insert original 5/16-18 x 3/4 in. screw (15) through mounting bracket (inboard side) on swingarm (2), 37/64 in. flat washer (21) from kit, belt guard mounting bracket (11), original flat washer (20), and original lockwasher (24). Secure with original 5/16-18 nut (16). Tighten to 19 ft-lbs torque.

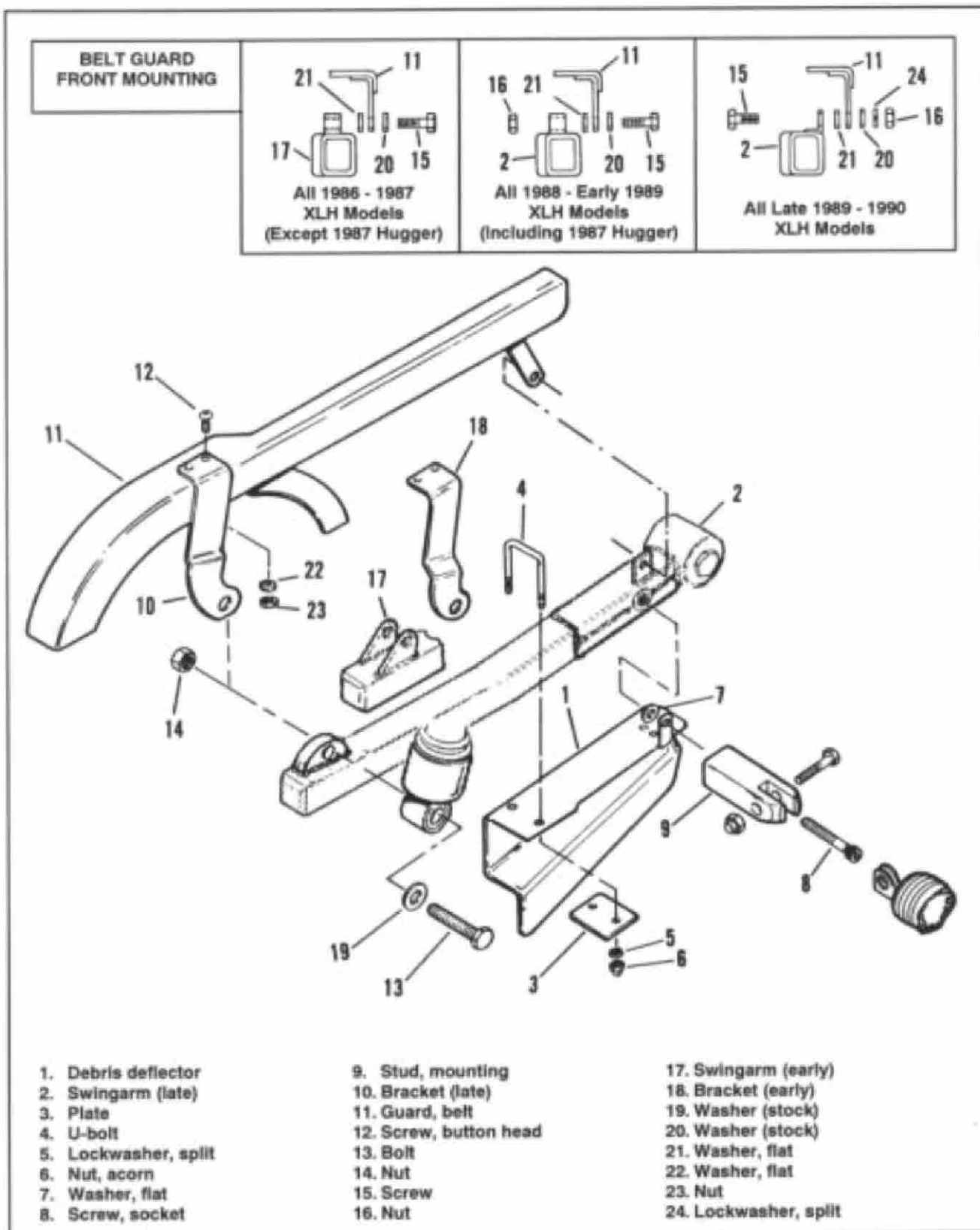


Figure 5. Debris Deflector and Belt Guard Assembly

## Installation/Assembly- Sprocket Cover, Brake Pedal and Exhaust System

1. Remove brake pivot stud from old sprocket cover. Install stud and pivot at new sprocket cover, tightening bolt to 50-60 ft-lbs torque.
2. Install new sprocket cover and secure with Allen screws. Tighten sprocket cover screws to 90-110 in-lbs torque. See Figure 1. Place master cylinder stiffener (6) over brake pivot stud. Position brake pedal (3) on brake pivot and secure with retaining ring.
3. Install exhaust system. Secure nuts at cylinder studs by tightening to 60-80 in-lbs torque. Place exhaust bracket over stud at sprocket cover and secure with nut (5). Tighten nut (5) to 50-60 ft-lbs torque. See Figure 2. Attach muffler to muffler support bracket (1) with original bolts, washers and nuts.
4. Attach master cylinder (4) to sprocket cover with original bolts and lockwashers. Tighten master cylinder bolts to 155-190 in-lbs torque. Insert clevis pin (2) through brake pedal and brake linkage rod end. Install new cotter pin (small) from kit in clevis hole. Install right front footrest.
5. Install clamp from kit around brake line. Position brake line over mounting hole in sprocket cover and attach with self-tapping screw and lockwasher from kit. Insert plug in vacant hole in sprocket cover.
6. Install exhaust shields.

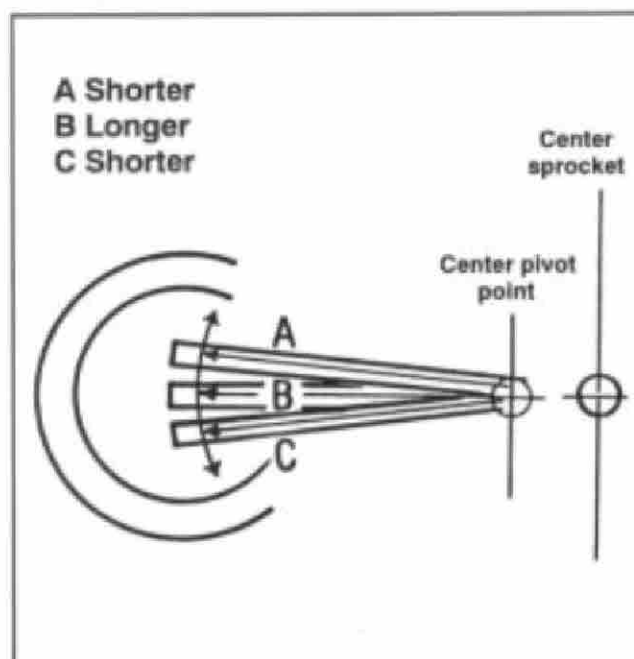
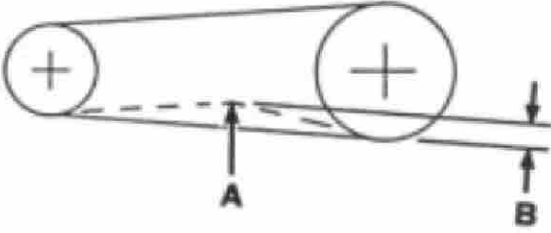


Figure 6. Swingarm Geometry

## Belt Drive Adjustment

See Figure 6. Ideally, if the swingarm pivoted about the center of the transmission sprocket, the distance between transmission and wheel sprockets would be the same throughout the swingarm's arc of travel. However, since the swingarm pivots at a point some distance to the rear of the transmission sprocket, the distance between sprockets will vary as the swingarm pivots up and down. Different shock absorbers, the angle of the shock absorbers and the point at which the shock absorbers are attached to the swingarm all affect the degree of swingarm travel. Since the tension of the drive belt will increase and decrease as the swingarm travels up and down, and since the degree of travel varies with different models of vehicles, it is important that the drive belt be adjusted to the optimum tension which will give the best performance and longest belt life. Adjustments are made with no weight on the vehicle, the transmission in neutral and with the vehicle resting on the jiffy stand.

1. Remove cotter pin, if present, and loosen axle nut.
2. Turn each adjusting nut an equal amount. Turn clockwise to tighten and counterclockwise to loosen, in order to adjust belt tension. Refer to chart below to determine tension specification for your particular model vehicle. Apply force to belt using Belt Tension Gauge (Harley-Davidson Part No. HD 40006-85).
3. Tighten the axle nut to 60-65 ft-lbs torque. Insert new cotter pin (large) from kit. Bend cotter pin over nut flats.

|  |         |                           |
|---|---------|---------------------------|
| VEHICLE   | A FORCE | B FORCE                   |
| All 1986 - 1987 XLH models (except 1987 Hugger)                                     | 10 lbs. | 5/8 in.                   |
| All 1988 - 1990 XLH models (including 1987 Hugger)                                  | 10 lbs. | 7/16 in.                  |
| Vehicles with after market shocks   | 10 lbs. | See special instructions. |



## Determining Belt Deflection On Vehicles With After Market Shocks

### NOTE

*This procedure can ideally be carried out during assembly of the kit. Doing so will avoid duplicating the processes of disconnecting/connecting the shocks and loosening/tightening the axle nut.*

1. Place vehicle on stand or raise vehicle with suitable blocking under frame, so rear wheel is raised off of floor.
2. Disconnect lower shock bolts at swingarm.
3. With a scissors jack or blocking, raise rear wheel so that swingarm is aligned with the centers of pivot bolt and transmission sprocket (as illustrated by line "B" in Figure 6). Check alignment with string or straight edge.
4. Adjust the rear axle to give 3/8 in. deflection with 10 lbs of force on the belt midway between sprockets. Apply force using Belt Tension Gauge (Harley-Davidson Part No. HD 40006-85).
5. Tighten the rear axle nut to 60-65 ft-lbs torque. Insert new cotter pin (large) from kit. Bend cotter pin over nut flats. Connect shock absorber lower bolts.
6. Lower vehicle to the ground. Rest vehicle on extended (down position) jiffy stand. Do not place any weight on the motorcycle (ie. no rider or other load on vehicle).
7. Measure the deflection with 10 lbs of force applied midway between sprockets. This deflection measurement will be used during all future adjustments of the belt. Mark the deflection measurement in the chart for future reference.

## Testing

Test ride vehicle and check for any belt interference or signs of misalignment. Check brakes for proper operation and inspection for brake line leakage.

## Belt Drive Precautions/Maintenance

- Clean belt with rag that is slightly damp with light cleaning agent.
- Inspect belt and sprockets on a regular basis for damage, misalignment, overheating and wear.
- Replace belt when there are signs of cracking, unusual wear or tooth loss.
- Maintain proper belt alignment.
- Replace any sprocket that shows unusual wear, broken teeth or damaged flange.
- Keep grease and oil off belt surfaces.
- Never pry belts onto or off sprockets. Never bend belts backward or into loops smaller than 5 in. in diameter. Mishandling can damage a belt, even before it is put into use on the motorcycle. Damaged belts must be replaced.

### WARNING

- Never operate motorcycle with belt guards and/or debris deflectors removed.
- Never attempt to check or adjust belt with engine running.