PROGRESSIVE suspension

# Installation Instructions 422 Series shocks with RAP for 89-99 Harley Davidson Softails

## ATTENTION

Statements in these instructions that are preceded by the following words are of special significance:

**Warning**

This means there is the possibility of injury to yourself or others.

**Caution**

This means there is the possibility of damage to the vehicle.

Note

*Information of particular importance has been placed in italics.*

**Warning**

Changing the chassis and/or suspension on any vehicle will change the handling characteristics of that vehicle. Care should be taken when operating the vehicle with such modifications while getting accustomed to the new handling characteristics.

## IMPORTANT NOTICE

**Caution:** Please read the following instructions completely before starting installation! Removing and reinstalling the shock absorbers must be performed by a qualified mechanic according to steps outlined in an authorized shop manual that relates to your particular make, model and year motorcycle. Process may require special tools, fixtures, and/or a press.

The vehicle must be securely blocked to prevent it from dropping or tipping when the shock absorbers are removed. Failure to do so can cause serious damage and/or injury!

Progressive Suspension Softail shocks are designed to work with the OEM (Original Equipment) chassis components. Use of this product on any chassis components other than OEM may produce an unsatisfactory ride and void the warranty.

Transmission bolts must be installed in the OEM position to insure proper clearances for the shocks. Consult your factory shop manual for proper installation.

Make sure that proper bushings/sleeves are installed in the shocks. Improper bushings/sleeves can cause unsatisfactory and/or unsafe operation.

# Installation

Progressive Suspension shocks for your Softail are designed as a direct bolt on replacement for your stock shocks. Although they are very similar in appearance, they have vastly improved damping and spring rates.

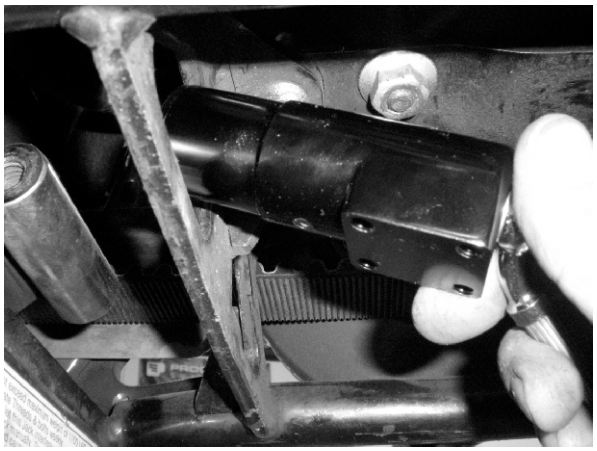
- Place motorcycle securely on stand or blocks so the rear wheel is slightly off the ground.
- Per instructions in a authorized shop manual, remove your old shocks. Note location of the mounting hardware.
- **While the shocks are off the bike either lower the bike or raise the rear wheel until the swingarm bottoms into the bumper on the frame. Take a measurement from the axle to a point on the fender or frame directly above it, and write that measurement here _____, as well as in the "Comp." (compressed) space on the "Rider Sag Worksheet" on page three. You will need this later to properly adjust your rider sag / preload.**
- Before installing your 422 RAP shocks, check the shock-eye length, this determines the mechanical ride height (see Ride Height Adjustment on page three)

- Install the Progressive Suspension 422 shock without the RAP on the left side using the stock mounting bolts and washers.

- Tighten all shock mounting bolts to the proper torque specifications (see shop manual for specs).

- Before mounting the 422 shock with RAP on the right hand side, remove the knob from the RAP adjuster to allow it to be routed through the frame and back to it's final mounting point. To do this simply remove the screw in the center of the knob and pull it straight off.

- As you mount the RAP equipped shock, feed the RAP adjuster through the shock-eye frame window then up and to the left side of the bike as shown.



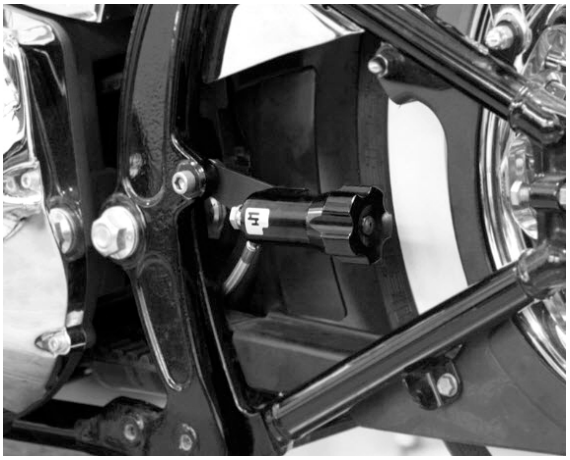
- When mounting the RAP shock make sure the adjuster line is lined up towards the center of the bike and slightly up so it has as much clearance as possible going through the aforementioned frame window. Then mount the shock using the stock mounting bolts and washers, and tighten all shock mounting bolts to the proper torque specifications (see shop manual for specs).


- Route the line up and then to the left side of the bike. As you do so, you should tie off the line to the swingarm pivot as illustrated.

- Route the line out the left side in front of the fender and above the lower belt-guard as illustrated.

- Mount the RAP adjuster to the bracket using the supplied M6-1.0X8mm SHCS fasteners and torque them to 80-90 in/lbs (9-10 N-m). Also reinstall the adjuster knob, apply a drop of thread-locking agent to the center screw, and torque it to 50 in/lbs (5.65 N-m).

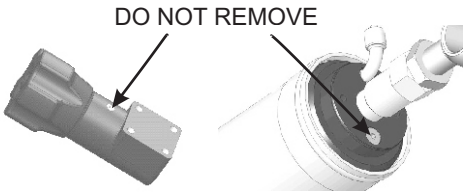
- The RAP adjuster bracket is designed to mount to the tab on the frame for the left passenger peg by sandwiching it between the bolt head and the inside of the frame.



- Proceed to Ride height and Preload adjustment.

**Caution**

NOTE: The internal fluid levels of your 422 with RAP shocks are set from the factory and NOT to be adjusted by the customer. Do NOT attempt to add/remove any fluid from any fill/bleed ports on the shocks (see below) as damage and/or injury will result and the warranty will be voided.



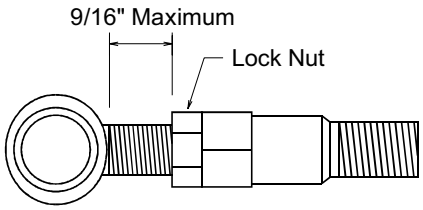

## Ride Height Adjustment

Your new 422 Series shocks with RAP have adjustable ride height and are capable of Stock to 2" lower ride height. The shocks come pre-assembled set at approximately 1.0" lower than stock height. The shock with the hydraulic line cannot be rotated once installed, thus the ride height adjustment must be done with the shocks off the bike.

- To adjust the ride height simply loosen the lock nut on the eye, and holding the hex on the shaft rotate the eye to the desired height.
- Measuring from the locknut to the end of the threads on the eye (see below) the ratio of adjustment is about 3.5 to 1, the more threads that are exposed the lower the ride height – no threads showing is stock height and 9/16" of the threads showing is 2" inches lower which is the maximum lowered setting. Adjust both shocks to the same length.
- When you reach the desired height, tighten the locknut on the eye down securely (14ft/lb.) on both shocks.

**Warning**

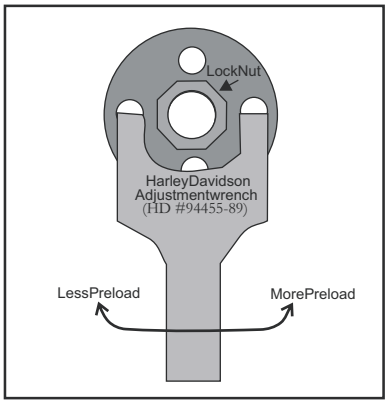
**Do not go further than this - damage or injury may result.**




## Preload Adjustment

Preload adjustment greatly affects ride quality. When the preload is adjusted properly, the suspension should "sag" or compress about one third of the total available travel with rider(s) & gear on the bike ready to ride – this is referred to as "rider sag". To accurately know your total available wheel travel you'll need to extend the suspension until it's completely topped out then measure from the axle to a point on the chassis directly above it, the same two measuring points used in the third step on page one of this instruction - this is "Ext." (or extended) in rider sag worksheet. Subtract the compressed measurement you wrote down on the third step on page one from the extended measurement you just took, and that is your true wheel travel. Your target rider sag should be about one third of that measurement (see "Rider Sag Worksheet" at right).

- Your new 422 series with RAP Softail suspension system actually has two methods of adjusting your preload. The most convenient is by simply turning the RAP adjuster knob – clockwise to increase preload (reducing sag) and counterclockwise to reduce preload (increase sag).
- If you reach either end of the RAP hydraulic adjustment, then you can shift the "range" of adjustment by adjusting the preload on the shock that does not have the hydraulic adjuster. This is done by using the supplied SW-784 wrench to first loosen the lock nut and back it off a few turns, then flip the wrench over and rotate the round spring-plate either counterclockwise to increase preload or clockwise to reduce preload – it may seem backward but the less threads showing the higher the preload, and the more threads that are showing the lower the preload. Once you've set the preload range, retighten the locknut.




- Use your RAP hydraulic adjuster to fine tune your rider sag. Often a small adjustment can make a big difference in ride quality. If it feels a little too stiff, reduce the preload a bit – if it bottoms, increase it.
- Test ride the bike and make further adjustments if necessary. Note: Adjusting the preload does not change the shock length.
- For a balanced suspension, we highly recommend installing a pair of Progressive Suspension fork springs or Monotube Fork Kit.
- Ride and enjoy.

PROGRESSIVE® suspension

# Installation Instructions 422 Series shocks with RAP for 00-Later* Harley Davidson Softails

## ATTENTION

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**Warning**

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## IMPORTANT NOTICE

**Caution:** Please read the following instructions completely before starting installation! Removing and reinstalling the shock absorbers must be performed by a qualified mechanic according to steps outlined in an authorized shop manual that relates to your particular make, model and year motorcycle. Process may require special tools, fixtures, and/or a press.

The vehicle must be securely blocked to prevent it from dropping or tipping when the shock absorbers are removed. Failure to do so can cause serious damage and/or injury!

Progressive Suspension Softail shocks are designed to work with the OEM (Original Equipment) chassis components. Use of this product on any chassis components other than OEM may produce an unsatisfactory ride and void the warranty.

Transmission bolts must be installed in the OEM position to insure proper clearances for the shocks. Consult your factory shop manual for proper installation.

Make sure that proper bushings/sleeves are installed in the shocks. Improper bushings/sleeves can cause unsatisfactory and/or unsafe operation.

# Installation

Progressive Suspension shocks for your Softail are designed as a direct bolt on replacement for your stock shocks. Although they are very similar in appearance, they have vastly improved damping and spring rates.

- Place motorcycle securely on stand or blocks so the rear wheel is slightly off the ground.
- Per instructions in a authorized shop manual, remove your old shocks. Note location of the mounting hardware.
- **While the shocks are off the bike either lower the bike or raise the rear wheel until the swingarm bottoms into the bumper on the frame. Take a measurement from the axle to a point on the fender or frame directly above it, and write that measurement here _____, as well as in the "Comp." (compressed) space on the "Rider Sag Worksheet" on page three. You will need this later to properly adjust your rider sag / preload.**

- Before mounting the 422 shock with RAP on the left hand side, remove the knob from the RAP adjuster to allow it to be routed through the frame and back to it's final mounting point. To do this simply remove the screw in the center of the knob and pull it straight off (fig.1).


Figure 1

- Prepare both shocks for mounting by threading the supplied non-flanged nuts all the way onto the stud mounts, followed by a supplied bushing-cup, bushing, and sleeve (fig.4).

- As you mount the RAP equipped shock, feed the RAP adjuster up and out the left side of the bike through the space between the swing-arm and fender of the bike as shown (fig.2).

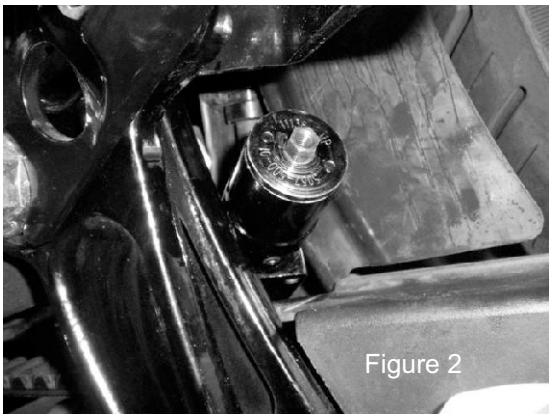


Figure 2

- When mounting the RAP shock make sure the adjuster line is pointing to the right and slightly up as illustrated (fig.3).

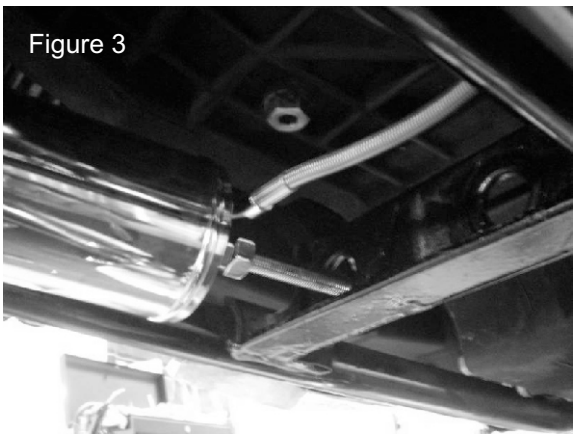


Figure 3

- Then install shocks as you would a stock unit, following an authorized shop manual - noting to route the adjuster line in a sweeping arc above the right non-RAP shock and towards the rear of the bike. With the non-flanged nut spun all the way onto the stud, the stock ride height is achieved (ride height adjustment will be addressed later).

- Once you have installed the other bushing, bushing-cup, and flanged nut you can now install the safety E-clip. This E-clip is snapped into the groove near the end of the stud mount where the threads stop. This is to serve as a reference point ONLY – when the flanged-nut reaches it you have lowered your ride height the maximum 2 inches. DO NOT torque the flange-nut against the E-clip (fig.4).

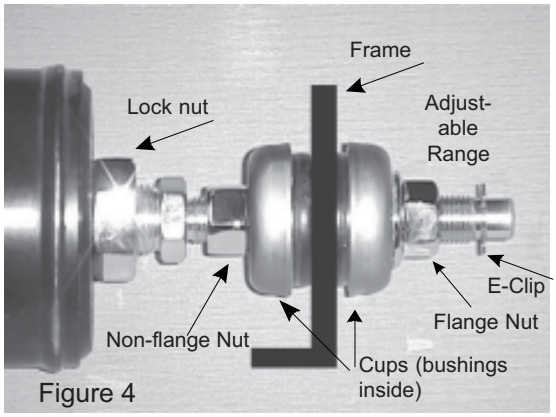


Figure 4

- Mount the rear eyes of the shocks using the stock bolts and washers, and tighten all shock mounting hardware to the proper torque specifications (see shop manual for specs). Route the adjuster line in a seeping arc above the right shock and toward the rear (fig.5).

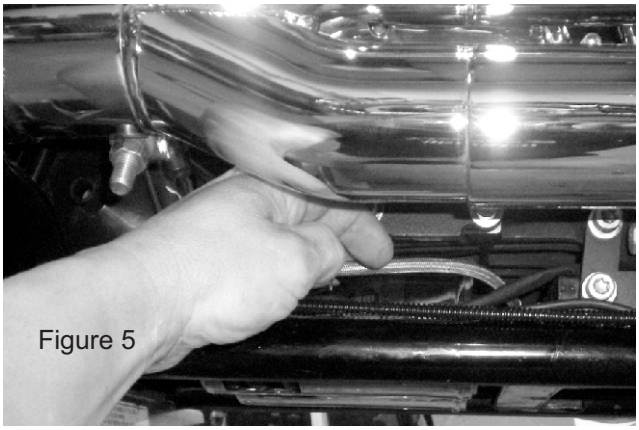


Figure 5

- Route the line up and then to the left side of the bike. As you do so, make sure the line will not be pinched, kinked, or exposed to excessive heat and use the included zip-ties to secure it in place. Route the line out the left side in front of the fender and above the lower belt-guard (fig.6).

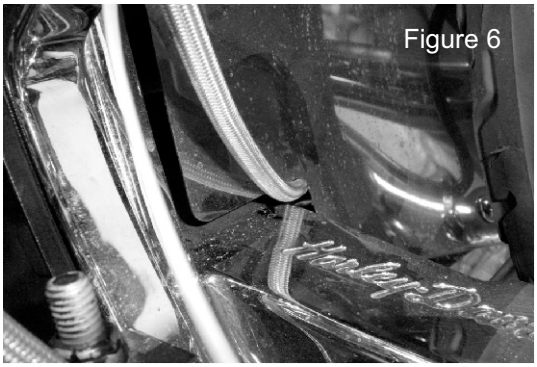


Figure 6

- Mount the RAP adjuster to the bracket using the supplied M6-1.0X8mm SHCS fasteners and torque them to 80-90 in/lbs (9-10 N-m). Also reinstall the adjuster knob, apply a drop of thread-locking agent to the center screw, and torque it to 50 in/lbs (5.65 N-m).

- The RAP adjuster bracket is designed to mount on the backside of the tab on the frame for the left passenger peg. This is done by sandwiching it between the frame and the supplied 3/8-16 nylock-nut. To do this you'll first have to replace your stock left passenger peg bolt with one of the supplied 3/8-16 bolts that is approximately ½ inch longer than stock - so that it sticks out the back of the frame far enough to mount the bracket and fully engage the supplied nylock-nut.

- Rotate the adjuster bracket assembly down until the indexing tab engages the frame and torque the supplied 3/8-16 nylock-nut to 25 ft/lbs. When mounted, it should look as illustrated in figure 7 (note foot-peg assembly not shown for clarity).

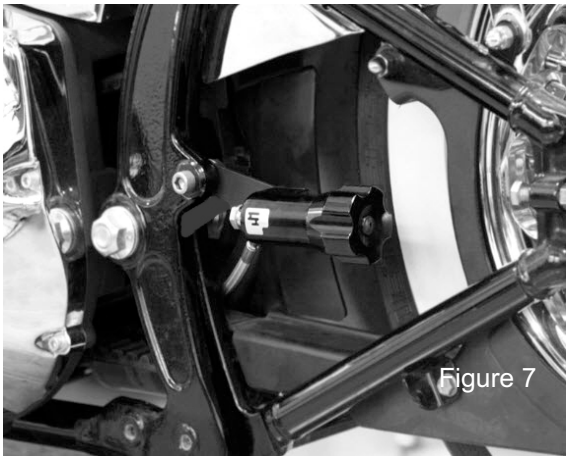
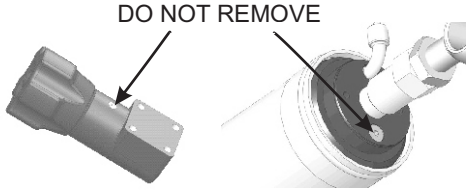


Figure 7

- Proceed to Ride height and Preload adjustment.

**Caution**

NOTE: The internal fluid levels of your 422 with RAP shocks are set from the factory and NOT to be adjusted by the customer. Do NOT attempt to add/remove any fluid from any fill/bleed ports on the shocks (see below) as damage and/or injury will result and the warranty will be voided.




## Ride Height Adjustment

Your new 422 Series shocks with RAP have adjustable ride height and are capable of Stock to 2" lower ride height. Per the installation instructions, your shocks should be at stock ride height initially. The ride height adjustment can be done with the shocks on the bike, and removal is not necessary. It is important that the locknut on the preload adjusting plate is securely tightened (refer back to fig.4).

- To lower your ride height, simply loosen the flange-nuts in equal amounts and when the desired height is reached tighten the non-flanged nuts back against the bushings (torque to factory recommended specifications).

**Warning**

**Do not tighten the flange nut against the E-clip, it is for reference only.**

- To raise the ride height, reverse the process. Start by loosening the non-flanged nuts away from the bushings, then start tightening the flanged nuts against the bushings (towards the rear of the bike). When the desired ride height is achieved, make sure the non-flanged nuts are re-tightened against the bushings.

- It will help to hold the stud with a 3/4" wrench on the hex portion of the stud to prevent it from turning while adjusting.

- NOTE: The amount the nuts move on the stud may not seem like much, but every 5/16" of an inch of adjustment equals approximately 1" of ride height.

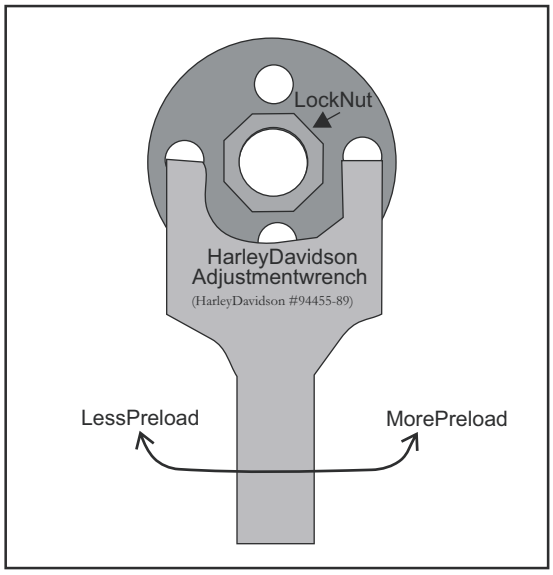
## Preload Adjustment

Preload adjustment greatly affects ride quality. When the preload is adjusted properly, the suspension should "sag" or compress about one third of the total available travel with rider(s) & gear on the bike ready to ride – this is referred to as "rider sag". To accurately know your total available wheel travel you'll need to extend the suspension until it's completely topped out then measure from the axle to a point on the chassis directly above it, the same two measuring points used in the third step on page one of this instruction - this is "Ext." (or extended) in rider sag worksheet below. Subtract the compressed measurement you wrote down on the third step on page one from the extended measurement you just took, and that is your true wheel travel. Your target rider sag should be about one third of that measurement (see "Rider Sag Worksheet" below).

- Note that by adjusting your Ride Height (as described in the previous section "Ride Height Adjustment") you change your "Ext." (extended) measurement on the Rider Sag Worksheet. Thus you must set your ride height first to accurately be able to calculate a target sag measurement.

## Preload Adjustment (cont.)

- Your new 422 series with RAP Softail suspension system actually has two methods of adjusting your preload. The most convenient is by simply turning the RAP adjuster knob – clockwise to increase preload (reducing sag) and counterclockwise to reduce preload (increase sag).
- If you reach either end of the RAP hydraulic adjustment, then you can shift the "range" of adjustment by adjusting the preload on the shock that does not have the hydraulic adjuster (on the right). This is done by using the supplied SW-784 wrench to first loosen the lock nut and back it off a few turns, then flip the wrench over and rotate the round spring-plate either counterclockwise to increase preload or clockwise to reduce preload – it may seem backward but the less threads showing the higher the preload, and the more threads that are showing the lower the preload. Once you've set the preload range, retighten the locknut.




- Use your RAP hydraulic adjuster to fine tune your rider sag. Often a small adjustment can make a big difference in ride quality. If it feels a little too stiff, reduce the preload a bit – if it bottoms, increase it.
- It's best to target having the RAP adjuster at or near the minimum preload setting for your lightest riding load - such as rider only with no baggage. That way as you add weight such as a passenger and/or baggage you will have plenty of range to adjust for it using only the RAP adjuster.
- Test ride the bike and make further adjustments if necessary. Note: Adjusting the preload does not change the shock length.
- For a balanced suspension, we highly recommend installing a pair of Progressive Suspension fork springs or Monotube Fork Kit.
- Ride and enjoy.

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# Installation Instructions
# 422 Series Shocks
# 2000 & Later* Harley Davidson Softails

## ATTENTION

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**Caution**

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Note

*Information of particular importance has been placed in italics.*

**Warning**

Changing the chassis and/or suspension on any vehicle will change the handling characteristics of that vehicle. Care should be taken when operating the vehicle with such modifications while getting accustomed to the new handling characteristics.

## IMPORTANT NOTICE

**Caution:** Please read the following instructions completely before starting installation! Removing and reinstalling the shock absorber, and the spring on said shock absorber, must be performed by a qualified mechanic or according to steps outlined in an authorized shop manual that relates to your particular make, model and year motorcycle. Process may require special tools, fixtures, and/or a press.

The vehicle must be securely blocked to prevent it from dropping or tipping when the shock absorber is removed. Failure to do so can cause serious damage and/or injury!

Progressive Suspension Softail shocks are designed to work with the OEM (Original Equipment) chassis components. Use of this product on any chassis components other than OEM may produce an unsatisfactory ride and void the warranty.

Transmission bolts must be installed in the OEM position to insure proper clearances for the shocks. Consult your factory shop manual for proper installation.

Make sure that proper bushings/sleeves are installed in the shocks. Improper bushings/sleeves can cause unsatisfactory and/or unsafe operation.

# Installation

Progressive Suspension shocks for your 2000 & later Softail are designed as a direct bolt on replacement for your stock units. Although they are very similar in appearance, along with offering adjustable ride height they also have improved damping and spring rates.

- Place motorcycle securely on stand or blocks so the rear wheel is slightly off the ground.
- Per instructions in a authorized shop manual, remove your old shocks. Note location of the mounting hardware.
- Before reinstalling a Progressive Suspension adjustable ride height shock, spin the non-flanged nut all the way onto the stud mount, followed by a bushing-cup, bushing, and sleeve. Then install shocks as you would a stock unit, following an authorized shop manual. With the non-flanged nut spun all the way onto the stud, the stock ride height is achieved. Once you have installed the other bushing, bushing-cup, and flanged nut you can now install the safety E-clip. This E-clip is snapped into the groove near the end of the stud mount where the threads stop.

This is to serve as a reference point ONLY – when the flanged-nut reaches it you have lowered your ride height the maximum 2 inches. DO NOT torque the flange-nut against the E-clip (see figure 1).

- Tighten all shock mounting bolts to the proper torque specifications (see shop manual for specs).

- Progressive Suspension shocks have adjustable pre-load to compensate for varying weights. The included wrench or a Harley Davidson pre-load adjustment wrench is necessary to adjust the pre-load setting. Replacement Progressive Suspension wrenches are available as Part # SW-784 from most Dealers and Accessory Stores and the Harley Davidson wrench is available as part #94455-89 from any Harley Davidson Dealer.

- Spring preload is set by us to the lightest setting. To increase preload for heavier riders/loads/passengers, loosen locknut with the inside portion of the supplied wrench or a 1-1/16" wrench and back it off several turns. Use the supplied wrench or a Harley adjustment wrench to turn the adjustment nut counterclockwise to the desired preload setting. Then tighten the 1-1/16" lock nut. Both shocks must be adjusted to the same, equal setting (See Figure 2).

**Note:** Maximum preload is reached when the locknut and adjusting plate are turned to the end of the threads (no threads showing). This distance is approximately ¼". Do not turn the locknut past the last thread!

- Test ride the bike and make further adjustments if necessary. Note: Adjusting the preload does not change the shock length.

Your new Progressive Suspension adjustable ride height shocks are capable of lowering your ride height up to 2". To lower your ride height, simply loosen the flange-nuts in equal amounts and when the desired height is reached tighten the non-flanged nuts back against the bushings (torque to factory recommended specifications). Do not tighten the flange nut against the E-clip, it is for reference only. To raise the ride height, reverse the process. Start by loosening the non-flanged nuts away from the bushings, then start tightening the flanged nuts against the bushings (towards the rear of the bike). When the desired ride height is achieved, make sure the non-flanged nuts are re-tightened against the bushings. It will help to hold the stud with a 3/4" wrench on the hex portion of the stud to prevent it from turning while adjusting. NOTE: The amount the nuts move on the stud may not seem like much, but every 5/16" of an inch of adjustment equals approximately 1" of ride height. It is important that the locknut on the preload adjusting plate is securely tightened (see figure 1).

- For a balanced suspension, we highly recommend installing a pair of Progressive Suspension fork springs.

- Ride and enjoy.

*Figure 1*

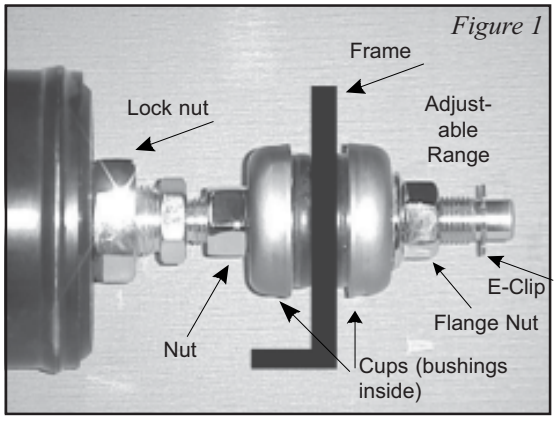
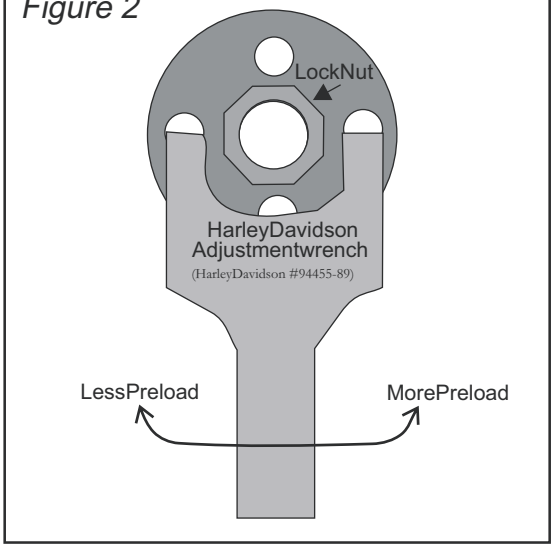



*Figure 2*

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