NOTES REGARDING THE FIT OF THE DAMPER ON THE CRANKSHAFT

All Professional Dampers are machined to original equipment dimensions and tolerances. If your crank is the correct diameter, your Professional Products damper should fit on the crank with the proper amount of press fit. Unfortunately, some aftermarket cranks vary from original equipment specifications due to modifications made to original equipment specifications. If your crank is too small, the damper may not seat properly, resulting in a possible loss of balance. If your crank is too large, it may be difficult to press the damper onto the crankshaft, and in extreme cases, it is possible to split the hub on the damper if the crank is too large. Another problem that may occur is, if a crankshaft is too long, there is a possibility of the hub opening section, which applies to all installations, being pinched. If the installed key height is too high*, you can grind the top surface of the key down. Some aftermarket cranks may not have the correct keyway machined deep enough.

Most Harmonic Dampers have bolt-in counterweights. The counterweight can be removed by tapping the bolt-in counterweight retaining screws until they are loose or rusty. If needed, polish with a very fine emery paper or steel wool. Wash clean and dry.

*Note: All above dimensions are in inches.

WARNING ON SAFE RPM LIMITS

The Professional Products Harmonic Dampers are designed to provide additional balance to the engine. However, there are maximum safe rpm limits for each type of damper. These limits are based on the experience we have gained in over 30 years of testing and experience with a variety of motorsports engines.

Professional Products offers two lines of Harmonic Dampers: POWER-EFFORF for high performance street applications, and POWER-EFFORF-PLUS, the SFI spec line for extreme performance and racing use. The first section of these instructions contains information that applies to all dampers for all types of engines. The basic installation of a Professional Products damper is essentially the same for every vehicle. If the general removal and installation instructions do not apply to any specific application, it will be so noted. Following these specific section instructions to all installations, there are additional safety warnings.

INSTALLATION PROCEDURE:

1. Engine should be cold.
2. Remove original damper. We recommend using a damper removal tool available at your local tool rental shop. We suggest you line up the TDC mark of the stock damper with the timing tab before removal. After installing new damper, if marks don’t line up, you will need to install an aftermarket tool or timing tab or possibly make a new one for your application.
3. Check the end of the crank to be sure that the snout has a tapped hole and that the threads are clean and not damaged. If your damper bolt does not thread easily into the crank, run a tap into the threads to clean them up. Some early cranks may require this hole to be drilled and tapped. If your crank does not have a tapped hole and your vehicle will be used primarily for non-racing, and the damper is a tight press fit when you install it, you may not require a bolt. 4. Inspect crank snout to see that there are not burrs or rust. If needed, polish with a very fine emery paper or steel wool. Wash clean and dry.
5. Examine key. If the key appears to be damaged or loose in the keyway, install a new key. Make sure key does not sit too high in crank. (See “Notes Regarding the Fit of the Damper on the Crankshaft” on back page.)
6. Replace the front timing cover oil seal. (Optional) 7.7. The PowerForce or PowerForce+Plus damper can be installed like any other damper using a damper installation tool, also available at tool rental shops.
8. Cover the crank snout and the timing cover oil seal with clean engine oil.
9. Smear damper bore with clean oil.
10. Position the damper on the crank snout. Rotate to align the keyway in the damper with the key in the crank. Make sure that the key is aligned with the keyway before forcing the damper on the crank snout. 11. Use an installation tool to install the damper. Follow instructions provided with the tool. Using the tool, force the damper on until seated against shoulder on crank. The damper is a press fit onto the crank and requires substantial force to fully seat it. Make absolutely sure that whatever you use to drive the damper on the crank is only seated on the hub. DO NOT apply any force against the outer inertia ring of the damper to force it tight. (See “Notes Regarding the Fit of the Damper on the Crankshaft” on back page.)
12. Meat the damper retaining bolt and washer and torque to manufacturers specifications. If your crank is too small, the damper may not seat properly, resulting in a possible loss of balance.
13. Check that the pulley alignment is correct.
14. Recheck for proper clearance of all components before restarting engine.

Note on Externally Balanced Dampers: Our externally balanced dampers have bolt-in counterweights. The counterweight can be removed allowing the damper to be used on an internally balanced engine. (Except #80001 and #90001. Do not use these dampers with our externally balanced damper without a counterweight.) Counterweights are also sold separately and may need to be used to increase the balance of engines balanced externally. External balanced engines, such as the SB Chevy 400, SB Fords, Big Block Chevys, AMC & Olds, AMT Chevys and some BB Fords, etc., do not have provision for external balance. To externally balance these cranks, cast iron. Nodular iron is roughly 30% stronger than gray iron which allows deeper keyways.

Note: These are safe rev limits for the listed dampers. Your engine may not be capable of safely revving to these limits due to other considerations.

Terque Specifications for Damper Crankshaft Bolts & Counterweight Attachment Bolts

<table>
<thead>
<tr>
<th>Crankshaft Bolt:</th>
<th>Counterweight Bolt:</th>
</tr>
</thead>
<tbody>
<tr>
<td>SB &amp; BB Chevy 60 lb. ft.</td>
<td>BB &amp; BB Chevy 60 lb. ft.</td>
</tr>
<tr>
<td>LT1 &amp; LS-1 Chevy 74 lb. ft.</td>
<td>SB &amp; BB Chevy 60 lb. ft.</td>
</tr>
<tr>
<td>Big Block Chevy 85 - 90 lb. ft.</td>
<td>BB &amp; BB Chevy 60 lb. ft.</td>
</tr>
<tr>
<td>Big Block Ford 70 - 90 lb. ft.</td>
<td>SB &amp; BB Chevy 60 lb. ft.</td>
</tr>
<tr>
<td>Mopar 150 - 155 ft. lbs.</td>
<td>SB &amp; BB Chevy 60 lb. ft.</td>
</tr>
<tr>
<td>Oldsmobile - 1964 - 67 Models 100 - 120 lb. ft.</td>
<td>AMC - 90 lb. ft.</td>
</tr>
<tr>
<td>AMC - 90 lb. ft.</td>
<td>AMC - 90 lb. ft.</td>
</tr>
</tbody>
</table>

Note: All above dimensions are in inches.

Note: #80000 and #90000 6-3/4" dampers have a mark for this position. Pre '69 engines have the TDC mark "2" to the left of the keyway centerline. The '69 and later dampers have the TDC mark "10" to the left of the keyway centerline. All of our SB Chevy, BB Chevy, SB Fords, Big Block Chevys and Mopars have the TDC mark "10". The pointer will be placed at this opening section, which applies to all installations, there are additional safety warnings.

Note: Some small block engines have used three different timing pointer locations. Pre '69 engines have the TDC mark "2" to the left of the keyway centerline. The '69 and later dampers have the TDC mark "10" to the left of the keyway centerline. All of our SB Chevy, BB Chevy, SB Fords, Big Block Chevys and Mopars have the TDC mark "10". The pointer will be placed at this opening section, which applies to all installations, there are additional safety warnings.

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These dampers are all neutral balance (no counterweight) although you have determined which model suits your engine, highlight the degree mark for your initial timing setting (or full advance setting if you power time your engine) on the damper. When you install the new damper, you will easily see if any of your existing timing marks are off, or if the new pointer that aligns with one of the three TDC marks on the new damper is not lined up with the original damper. To check this, rotate the crank until the keyway is straight up in the 12 o'clock position. Then check the degree mark in the crank and observe which set of timing marks on the damper lines up with your pointer. If you are building a new engine from scratch, and it is a neutral balanced assembly… and also has the stock accessory pulley bolt pattern on it. In this case, you can use this damper simply by removing the counterweight. Our Olds dampers, if you elect to convert your crank to an internally balanced engine, will need both the damper and the flexplate or flywheel to properly balance your engine. Some engine builders convert externally balanced engines to internally balanced engines have no offset weight on the damper or flywheel/flexplate. If you want to do this with your engine, simply use our balance without any of the bolt-in weights. Small Block Ford V8 Engines - All 351, 361, 383, 400, 413, 424, 460 including 426 Hemi. (Will not fit early Hemi)
Neutral Balance Engines - Neutral balance means the same as internal balance but it pays to check to make sure.

Olds V8 Engines - 350, 400, 403, 425, 455
The Olds harmonic damper fits a wide range of Oldsmobile engines. It is an externally balanced assembly so all Olds engines use a bolt-in damper. We can use this damper simply by removing the bolt-in weights. If you want to convert your crank to an internally balanced engine, some shops will not balance an assembly with these sub-standard aftermarket dampers, so the chances of you having a balanced assembly with one of these dampers is slim. If you do use an Olds damper, note that the outside diameter of the damper is 3-9/16 inches. The Oring seal is a Teflon type. To determine which spacer you need, measure the length of your alternator pulley. To determine which spacer you need, measure the length of your alternator pulley. To determine which spacer you need, measure the length of your alternator pulley. To determine which spacer you need, measure the length of your alternator pulley. To determine which spacer you need, measure the length of your alternator pulley.

Small Block Chrysler V8 Engines - All 273, 318, 360 and 360 cid V8s including Magnum.
Neutral Balance Engines - Neutral balance means the same as internal balance but it pays to check to make sure.

Small Block Ford V8 Engines - '60 & earlier 289/302/323/351/351C/351M/400 and '81 & later 5.0L V8
How to Determine Which Timing Marks to Use - Ford has used three different sets of timing marks on their engines in various locations. Our small block Ford dampers have three sets of timing marks on them, and one set should align with your pointer. To check this, rotate the crank until the keyway is straight up in the 12 o'clock position. Then check the degree mark in the crank and observe which set of timing marks on the damper lines up with your pointer. If you are building a new engine from scratch, and it is a neutral balanced assembly… and also has the stock accessory pulley bolt pattern on it. In this case, you can use this damper simply by removing the counterweight. Our Olds dampers, if you elect to convert your crank to an internally balanced engine, will need both the damper and the flexplate or flywheel to properly balance your engine. Some engine builders convert externally balanced engines to internally balanced engines have no offset weight on the damper or flywheel/flexplate. If you want to do this with your engine, simply use our balance without any of the bolt-in weights. Small Block Ford V8 Engines - All 351, 361, 383, 400, 413, 424, 460 including 426 Hemi. (Will not fit early Hemi)
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Small Block Ford V8 Engines - #89 & earlier 390/302/351W/351C/351M/400 and '81 & later 5.0L V8

How to Determine Which Timing Marks to Use - Ford has used three different sets of timing marks on their engines. Our small block Ford dampers have three sets of timing marks on them, and one set should align with your pointer. To check this, rotate the crank until the keyway is straight up in the 12 o'clock position on your damper. This should make the keyway visible in the crank and observe which set of timing marks on the damper lines up with the keyway on the crank. If you have determined which marks suit your engine, highlight the degree mark for your initial timing setting (after you install the damper (your engine) paint or grease pencil. Or yellow or white will show best.

Small Block Ford V8 Engines - #89 & earlier 390/302/351W/351C/351M/400 and '81 & later 5.0L V8

How to Determine Which Timing Marks to Use - Ford has used three different sets of timing marks on their engines. Our small block Ford dampers have three sets of timing marks on them, and one set should align with your pointer. To check this, rotate the crank until the keyway is straight up in the 12 o'clock position on your damper. This should make the keyway visible in the crank and observe which set of timing marks on the damper lines up with the keyway on the crank. If you have determined which marks suit your engine, highlight the degree mark for your initial timing setting (after you install the damper (your engine) paint or grease pencil. Or yellow or white will show best.

Small Block Ford Harmonic Damper Spacer Selection Chart

<table>
<thead>
<tr>
<th>Engine Type</th>
<th>Dampener Diameter</th>
<th>Model Year</th>
<th>Use Spacer</th>
</tr>
</thead>
<tbody>
<tr>
<td>351W/351C/400M 1</td>
<td>3.400</td>
<td>1969-80</td>
<td>#81006 (.350&quot;) 4-Bolt</td>
</tr>
<tr>
<td>351W/351C/400M 2</td>
<td>3.875</td>
<td>1969-80</td>
<td>#81007 Steel for blown engines</td>
</tr>
<tr>
<td>351W/351C/400M 3</td>
<td>3.950</td>
<td>1970-80</td>
<td>#81007 (.350&quot;) 4-Bolt</td>
</tr>
<tr>
<td>351W/351C/400M 4</td>
<td>3.875</td>
<td>1969-80</td>
<td>#81008 (.875&quot;) 4-Bolt</td>
</tr>
</tbody>
</table>

Small Block Chrysler V8 Engines - All 1973 to 1980, including 400, 360, and 440ci engines

How to Determine Which Counterweight to use: - For technical assistance, call 323-779-2020 and ask for the Tech Help.

Small Block Chrysler V8 Engines - All 273, 318, 340, and 360ci V8s including Magnum. Neutral Balance Engines - Neutral balance means the same as internally balanced engines. An internally balanced engine is a damper and a matching weight on the flywheel or flexplate. Internally balanced engines are balanced for operation in conjunction with a camshaft and an externally balanced damper. Some engine builders convert externally balanced engines to internally balanced by adding Mallory metal to the crank counterweights which eliminates the need for a counterweight on the flywheel or flexplate. Be sure to check all parts of the engine when you replace your engine to make sure all of the parts are balanced the way you want them to be balanced with your engine, simply use our balance without any of the bolts. Neutral Balance Engines - Neutral balance means the same as internally balanced engines. An internally balanced engine is a damper and a matching weight on the flywheel or flexplate. Internally balanced engines are balanced for operation in conjunction with a camshaft and an externally balanced damper. Some engine builders convert externally balanced engines to internally balanced by adding Mallory metal to the crank counterweights which eliminates the need for a counterweight on the flywheel or flexplate. Be sure to check all parts of the engine when you replace your engine to make sure all of the parts are balanced the way you want them to be balanced with your engine, simply use our balance without any of the bolts.
## WARNING ON SAFE RPM LIMITS

All Professional Products PowerForce Dampers (this is all dampers in the #80000 series except the #80010) are made of tough nodular cast iron. It is stronger than gray iron which is usually used for all production harmonic dampers and many aftermarket dampers. The PowerForce dampers can safely be revved to higher rpm than a stock damper. However, with safety in mind, please adhere to the listed safe rev limits. The #8000 Series PowerForcePlus and the #80010 are made of tough 1045 steel and can safely be revved to 10,040 rpm. As of the SFI testing procedure, our #8000 Series dampers are revved to 12,500 rpm for one hour. However, a static test such as this does not duplicate the loads that are put on the damper in racing applications.

## SAFE REV LIMITS

- #80000 Series Dampers = 10,000 rpm
- #80010 Damper = 10,040 rpm

All other #80000 Series Dampers = 6,500 rpm

Note: These are safe rev limits for the listed dampers. Your engine may not be capable of safely revving to these limits due to other considerations.

## NOTES REGARDING THE FIT OF THE DAMPER ON THE CRANKSHAFT

All Professional Products dampers are machined to original equipment dimensions and tolerances. If your crank is the correct diameter, your Professional Products damper should fit on the crank with the proper amount of press fit. Unfortunately, some aftermarket cranks are not made to original equipment specifications. If your crank is too small, the damper will not have the correct amount of press fit. If your crank is too large, it may be difficult to press the damper onto the crankshaft, and in extreme cases, it is possible to split the hub on the damper if the crank is too large. Another problem that may occur at times, is a crankshaft that is too large, or a keyway that is too tall. If the key sets too high in the crank, this can cause serious problems....again the possibility of splitting the hub can occur, which can be an expensive problem.

Because our dampers are made to the highest standards, it is highly unlikely for the bore or the keyways on our dampers to be out of tolerance. We have not found this to be a problem, but anything is possible so we are providing you with the factory specifications for crank diameters and damper bore diameters along with the maximum recommended installed key height. It is always a good idea to check all these dimensions before attempting installation. Or, if you run into problems of the damper fitting too loose or too tight, these dimensions will let you know where the problem is. If the installed key height is too high, you can grind the top surface of the keyway down. Some aftermarket cranks may not have the keyway machined deep enough.

**Crank Keyway Depth**

Harmonic damper keyway depth is possible, so we are providing you with the factory specifications for crank diameters and damper bore diameters along with the maximum recommended installed key height. It is always a good idea to check all these dimensions before attempting installation. Or, if you run into problems of the damper fitting too loose or too tight, these dimensions will let you know where the problem is. If the installed key height is too high*, you can grind the top surface of the keyway down. Some early cranks may require this hole to be drilled and tapped so that the damper can be installed. If the damper is too tall, the vehicle will be used primarily for non-racing, and the damper is a tight press fit when it is installed, you may require a 4. Import crank sprocket to see that there are no burrs or rust. If needed, polish with a very fine emery paper or steel wool. Wash clean and dry. (See "Notes Regarding the Fit of the Damper on the Crankshaft" on back page.)

5. Examine key. If the key appears to be damaged or loose in the keyway, install a new key. Make sure key does not sit too high in crank. (See "Notes Regarding the Fit of the Damper on the Crankshaft" on back page.)

6. Replace the front timing cover oil seal. (Optional) 7. Transfer of the damper on the crank. Rotate to align the keyway in the damper with the key in the crank. Make sure that the key is aligned with the keyway before forcing the damper on the crank snout. 11. Use of the damper on the crankshaft. Follow instructions provided with the tool. Using the tool, force the damper on until seated against shoulder on crank. The damper is a press fit onto the crank and requires substantial force to fully seat it. Make absolutely sure that whatever you use to drive the damper onto the crank is only seated on the hub. DO NOT APPLY ANY force against the outer inertia ring of the damper against the anodized colored retaining ring on PowerForce+Plus dampers.

10. Reinstall the damper retaining bolt and washer and torque to manufacturer's specifications. See torque specification chart below.

13. Check that the pulley alignment is correct.

12. Reinstall the damper retaining bolt and washer and torque to manufacturer's specifications. See torque specification chart below.

**Counterweight Attachment Bolts:**

- **Carbureted Engines:**

<table>
<thead>
<tr>
<th>Engine</th>
<th>Mopar</th>
<th>Pontiac</th>
<th>Olds</th>
<th>AMC</th>
</tr>
</thead>
<tbody>
<tr>
<td>#80000 Series</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>#80010</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Note on Externally Balanced Dampers: Our externally balanced dampers have bolt-in counterweights. The counterweight can be removed allowing the damper to be used on an internally balanced engine. (Except #80001 and #90001. Do not use these dampers without external counterweights.) Counterweights are also sold separately and may be added to use an internal style damper on an externally balanced engine.

External balanced engines, such as the SB Chevy 400, SB Fords, BB Chevy 454, Olds, AMC Chevys and some BB Fords, have eccentric counterweights. The front timing pointer location is 10° to the left of the keyway centerline. All of our SB Chevy dampers are bolted like any other damper using a damper installation tool, also available as tool rental shops. (See "Notes Regarding the Fit of the Damper on the Crankshaft" on back page.)

8. Replace the front timing cover oil seal. (Optional) 7. Transfer of the damper on the crank. Rotate to align the keyway in the damper with the key in the crank. Make sure that the key is aligned with the keyway before forcing the damper on the crank snout. 11. Use of the damper on the crankshaft. Follow instructions provided with the tool. Using the tool, force the damper on until seated against shoulder on crank. The damper is a press fit onto the crank and requires substantial force to fully seat it. Make absolutely sure that whatever you use to drive the damper onto the crank is only seated on the hub. DO NOT APPLY ANY force against the outer inertia ring of the damper against the anodized colored retaining ring on PowerForce+Plus dampers.

10. Reinstall the damper retaining bolt and washer and torque to manufacturer's specifications. See torque specification chart below.

13. Check that the pulley alignment is correct.

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Torque Specifications for Damper Crankshaft Bolts & Counterweight Attachment Bolts

<table>
<thead>
<tr>
<th>Crankshaft Bolt:</th>
<th>SB Chevy - 400</th>
<th>BB Chevy - 454</th>
<th>Olds - 442</th>
</tr>
</thead>
<tbody>
<tr>
<td>#80000 Series</td>
<td>70-90 lb. ft.</td>
<td>70-90 lb. ft.</td>
<td>70-90 lb. ft.</td>
</tr>
<tr>
<td>#80010</td>
<td>135 lb. ft.</td>
<td>135 lb. ft.</td>
<td>135 lb. ft.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Counterweight Attachment Bolts:</th>
<th>SB &amp; BB Chevy - 454</th>
<th>Olds - 442</th>
</tr>
</thead>
<tbody>
<tr>
<td>#80000 Series</td>
<td>40-50 lb. ft.</td>
<td>40-50 lb. ft.</td>
</tr>
<tr>
<td>#80010</td>
<td>100-110 lb. ft.</td>
<td>100-110 lb. ft.</td>
</tr>
</tbody>
</table>

#80001-05-25-07