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BDG Instruction Manual

And Warranty

Version 1

1200 Series Oil Pumps

Notes on your new oil pump.

This oil pump has been carefully assembled by BDG technicians to ensure that your pump conforms to our standards. As such, it is ready for use right out of the box. However, the following needs to be noted.

1. The default pressure setting on this pump may need adjusting for your engine. Instructions for this are contained within this manual. Please proceed with caution when setting your oil pressure.
2. This oil pump contains O-ring seals on all sealing surfaces and shafts. In storage, these seals may stick to the shafts causing the pump to feel a little stiff. This is normal, and as soon as the pump starts to rotate, and some oil begins to flow, the seals will free up allowing a nice easy rotation.
3. For belt drive pumps, a spacer must be installed between the two pump mounting lugs to ensure that there are no undue bending forces on the pump.

LIMITED WARRANTY

Please read carefully.

We warrant that **BDG.com.au** products are manufactured from the highest quality materials we can source, and that where applicable these materials will meet Aircraft Quality Standards. **BDG.com.au** guarantees workmanship to meet or exceed the machining tolerances that are generally accepted within the motor sport industry, as of the date of delivery. All products manufactured by **BDG.com.au** should be installed by professional engine builders, who are knowledgeable about the assembly of high performance engines.

If **BDG.com.au** receives notice that a product is defective, out of tolerance or not as specified above within thirty days of delivery, **BDG.com.au** may, at its option, repair or replace the part in question. If the defective parts are determined to be non-replaceable, the buyer shall be entitled to a refund of the original purchase price. These remedies are the buyer's sole and exclusive remedies. In no event shall **BDG.com.au** be liable for direct, incidental or consequential damages of any type.

This warranty is exclusive. No other warranty, whether written or oral, is expressed or implied. **BDG.com.au** specifically disclaims the implied warranty of merchantability and fitness for a particular purpose.

Any modification to any **BDG.com.au** product, or parts therein, in any manner, made after their departure from the **BDG.com.au** facility will render all warranties null and void.

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Pressure relief valve adjustment

Tools required:

- 2 x ¾" open-end spanners
- 1 x ¼" allen key

1. Using two (2) ¾" spanners, hold the relief valve with one, and loosen the locking nut with the other (the pressure relief valve cartridge can rotate in the pump housing with no detrimental effect to performance).
2. Once relief valve lock nut is loose, use a ¼" allen key to screw relief valve adjuster in or out, depending on whether the oil pressure is too high or too low (screwing relief valve adjuster "in" increases the oil pressure; screwing relief valve adjuster "out" decreases oil pressure).
3. ***The maximum amount of adjustment is*** 10 turns; screw the relief valve adjuster all the way in until it stops, and wind out 10 turns.
4. While screwing adjuster in or out, use ¾" spanner to hold locking nut from rotating.
5. Once desired oil pressure is obtained, use two (2) ¾" spanners to retighten locking nut.
6. ***To reset pressure relief valve to factory settings;*** screw the relief valve adjuster all the way in until it stops, and wind out 5 turns with **BDG blue spring**.



BDG supplies two (2) extra pressure relief valve springs. Your pump comes with a **blue** spring installed, and a **red** and **yellow** spring in the box:

The **red** spring is a lighter spring that will give your pump a lower pressure adjustment range. This should be used if you cannot decrease your oil pressure to the desired figure with the **blue** spring installed in your pressure relief valve.

The **yellow** spring is a heavier spring that will give your pump a higher pressure adjustment range. This should be used if you cannot increase your oil pressure to the desired figure with the **blue** spring installed in your pressure relief valve.

To change your pressure relief valve spring, you need to remove the relief valve adjuster from the relief valve cartridge. The pressure relief valve spring is located directly under the relief valve adjuster. When you remove the relief valve adjuster from the relief valve cartridge, you may then remove the relief valve spring from the cartridge. Ensure that the relief valve piston does not fall out of the relief valve cartridge, as the spring is its only retainer. Once you have removed the **blue** spring, fit your desired (**red** or **yellow**) spring, and screw relief valve adjuster as per factory settings (see point 6 above).

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Removing and installing the pressure relief valve cartridge

Tools required:

- ❑ 1 x 3/4" open-end spanners
- ❑ 1 x 3/16" allen key
- ❑ small tension wrench
- ❑ small flat screwdriver
- ❑ Loctite 262

To Remove:

1. Using a 3/4" spanner and a 3/16" allen key, loosen the small cap screw, retaining the pressure relief valve cartridge with the 3/16" allen key and use the 3/4" spanner to hold the cartridge body.
2. Once the cap screw and retaining washer have been removed, the cartridge body can then be slid out of the rear pump housing. You may need to use a small screwdriver to remove the O-ring seal from the rear pump housing. This O-ring is located underneath the retaining washer.

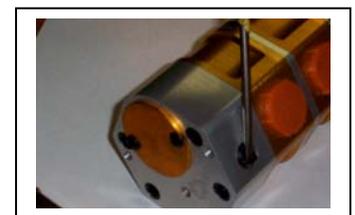


Before any components are installed into your BDG oil pump, they should be thoroughly cleaned in a solvent (or equivalent) cleaner.

You should always replace your O-ring seals whenever servicing any component of your BDG oil pump (seal kits are available from BDG).

To Install:

1. Fit a new O-ring seal to the adjuster end of your pressure relief valve cartridge. This seal should be fitted using rubber grease or an equivalent lubricant. This seal is fitted to an O-ring groove (see diagram)
2. Slide pressure relief valve cartridge into the suction side of the pump housing. The adjusting end of your pressure relief valve cartridge should hang out the suction side of your oil pump
3. Once your pressure relief valve cartridge is inserted into the pump housing, you then need to fit the small O-ring seal to the end of the pressure relief valve cartridge. The seal fits between the cartridge end and the pump housing. With the seal inserted using rubber grease, the retaining washer and cap screw can be fitted (BDG advise some Loctite 262 should be fitted to the cap screw)



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4. Using the $\frac{3}{4}$ " spanner to hold the relief valve cartridge from turning, tighten the retaining washer and cap screw assembly to 15 ft lbs

Disassembly and Assembly of the 120 series oil pump

Disassembly

NOTE: Please lay all pump components out in order of disassembly as parts from one segment should not be mixed with parts from another segment, these components run at very tight tolerances and a mismatch in parts may have an adverse effect on pump performance.

1. Remove pressure relief valve cartridge as per instructions; **Removing and installing the pressure relief valve cartridge.**
2. Using a $\frac{1}{4}$ " allen key remove the four (4) retaining nuts in the front pump housing.
3. Then hold the pump vertically in a vice via the drive shaft. Take care not to damage this shaft.
4. Using a $\frac{1}{8}$ " allen key remove the two (2) screws retaining the rear bearing cap cover, and a small flat screwdriver to flip the cap out.
5. Using a pair small outside circlip pliers remove the retaining circlip from the rear of the main shaft.
6. Using a $\frac{1}{8}$ " allen key, screw the Idler shaft locking screw in (this will push the rear pump housing out) this should be wound all the way into the rear pump housing. You can now remove the rear pump housing and 4 studs from the pump.
7. You will now be able to remove the pump gear housing (segment) by sliding it up the main shafts.
8. You will now be able to remove the gears from this segment by sliding the Idler gear (aluminum/bronze) off first, and then the drive gear (steel). Now you should remove the woodruff key(s) from the main shaft.
9. You will now be able to remove the divider plate by sliding it up the main shafts.
10. Repeat steps 6, 7 and 8 (depending on the number of segments your BDG pump has) until you have removed all segments.
11. You will now be able to remove the main shaft by sliding it through the front bearing and seal. (It is best to slide this shaft out the front of your pump, as any burrs on the front of the shaft may damage the seal or bearings).

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12. You should now remove the 4 retaining studs from the rear housing by unscrewing them. If these studs are too tight you may need to lock 2 nuts (1/4"unc) together at the top off each stud to enable you to remove them.

Assembly:

Note: pump assembly should be carried out by suitable experienced personnel. Ensure all parts are thoroughly cleaned prior to reassembly. Replace all seals and bearings if parts are outside normal condition levels.

Assembly is the reverse of the disassembly shown above. However, care must be taken to ensure good pump segment alignment so that the pump will run freely and not rub on any of the segments.

It is also important to ensure that the steel gears fit freely over the woodruff keys to ensure that the gear is not going to be forced into a crooked position causing binding between the gears and segments.