

**BEANS DIESEL**

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# 12MM GRIDLOCK GIRDLE INSTRUCTIONS

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# Parts List

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- Billet Aluminum Gridlock Girdle with Steel Dowel Pins (1)
- 12mm Main Studs (14)
- Hardened Washers (14)
- 12 Point Nuts (14)
- ARP Lube Packet
- ½" x 13 Set Screws (7)
- ½" x 13 Flange Nuts (7)
- Oil Pickup Tube Spacers (2)
- Oil Pan Bolts (32)
- Oil Pickup Tube Bolts (2)
- 10mm Block Stiffener Bolts (12)
- 10mm Extra Long Block Stiffener Bolts For Oil Pickup Brackets (2)

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## CONCEPT AND DESIGN

The BDP Gridlock Girdle was conceived out of the need of a super strong girdle that didn't have a lot of unnecessary parts to it, was lightweight, and did not interfere with the oil pan requiring dents in the pan. We have used other girdles on the market and these were always issues that we didn't like: washer/spacers that were prone to crack and break, studs that hit the oil pan requiring dents in the pan that caused oil leaks, and extra locknuts that did not like to be used more than once.

So, what we came up with when looking at all of these issues, is a Girdle system that not only fixes the issues stated above, but also increases the strength of the main caps by locking them in place with dowel pins, tying in the entire bottom side of the block by encompassing every available bolt all the way to every edge of the block. Then, to increase the main cap strength even more, pre-load set screws were added over the center of each main cap. This helps prevent the main caps from bending and bowing under extreme loads of big HP engines.

So, what about the aluminum? Why use aluminum instead of steel for a girdle. We first made these out of tool steel. Besides the tool steel making the machine time extremely long and more tedious, the finished product was ridiculously heavy!

After giving it some thought, why does it need to be a tough tool steel anyway? A girdle system is there to tie the main caps together in order to help prevent main cap walk as well as tie in each side of the block together. All of these forces are tensile forces. While tool steels can have 2 times or more tensile strength, the overall thickness of the Gridlock Girdle more than makes up for the difference. Other girdles on the market are only around .300 of an inch thick, less than half. This gives the Gridlock Girdle more than TWICE the tensile strength as the leading competition's girdle. All this

while weighing less. By using pressed in steel inserts at the main studs, we prevent the main stud nuts from squishing the softer aluminum as well as locking the mains in place with a built in locating dowel in those inserts.

## Installation

**Start the installation by making sure the oil pan rails are completely clean and free of all old gasket materials or sealants.**

**It is recommended that you have a machine shop line hone your mains with the girdles installed before assembling your engine. Torque characteristics are different with studs over the factory bolts and can thus deform your main caps causing uneven wear on your bearings. While we have installed studs and girdle without line honing, we definitely don't recommend it! The line hone needs to be done with the girdle fully installed and completely torqued down along with the main cap pre-load screws.**

Install the main caps over your crank in the correct order and tap them down tight to the block. Have the rear and front cover already installed. The Girdle is designed to have a .002-.003 gap between it and the pan rails once torqued down at the mains. This is designed to add extra down force against the main caps once all of the pan bolts and block stiffening bolts are installed. Line up the Girdle dowel pins to the main caps then tap it down into the main cap holes until it is snug against the main caps in all areas. Install all 14 main studs with a light oil coating on the threads. Only run them down until lightly snug. Using the ARP Lube liberally coat all of the washers and install over the studs then do the same with the nuts as well as coating the threads on the studs. Starting in the middle and working outwards, torque the main studs down in 3 steps to 125 ft-lbs. As you tighten down the studs, rotate the crank to make sure it stays free and doesn't have any hard spots in the rotation. If you develop a hard spot then you may have an issue with the main bores or bearings.

**Main Cap Pre-load set screws.** The pre-load screws are an extra step we take to prevent cap deformity under extreme HP and TQ loads and stresses. Under extreme loads the center of the main caps can bow and bend because the cap material is fairly soft. Having the pre-load screws in the middle helps strengthen the center of the caps to prevent this. The

amount of pre-load torque used on these set screws is extremely important. It takes very little pressure to deform the main caps. We suggest torquing these down to our specified TQ value and use the lock nuts to lock them in place before line honing. Once line honed you will have a perfectly round main cap journal and as long as you don't mess with the pre-load screws anymore you will have that perfection once all assembled with the crank installed as well. **TORQUE THE MAIN CAP PRE-LOAD SCREWS TO 10 INCH POUNDS.** Hold the screw in place and lock down the locking nut. If you are installing this girdle and do not get your block line honed (highly recommended you do) then do not tighten the pre-load screws down any tighter than finger snug then tighten down the lock nuts.

Lightly oil all the block stiffener bolts and install all except for the two longer ones for the oil pickup tube. Torque to 57 ft-lbs. Using the Cummins Pickup tube gasket, install the pickup tube with the two longer 8mm bolts and TQ to 25 ft-lbs. Use the two spacers to go under the hold down brackets and then use the two longer block stiffener bolts here, also torquing down to 57 ft-lbs.

Now all that's left is to install the oil pan. Install using the supplied gasket. Make sure your pan rails are straight before installing to prevent leaks. Make sure the center two holes in both the front and rear covers are clean and free of any old RTV and make sure the new bolts do not go too deep and bottom out in the blind holes. If you bottom the bolts out it will crack the aluminum and it **WILL** leak oil.

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