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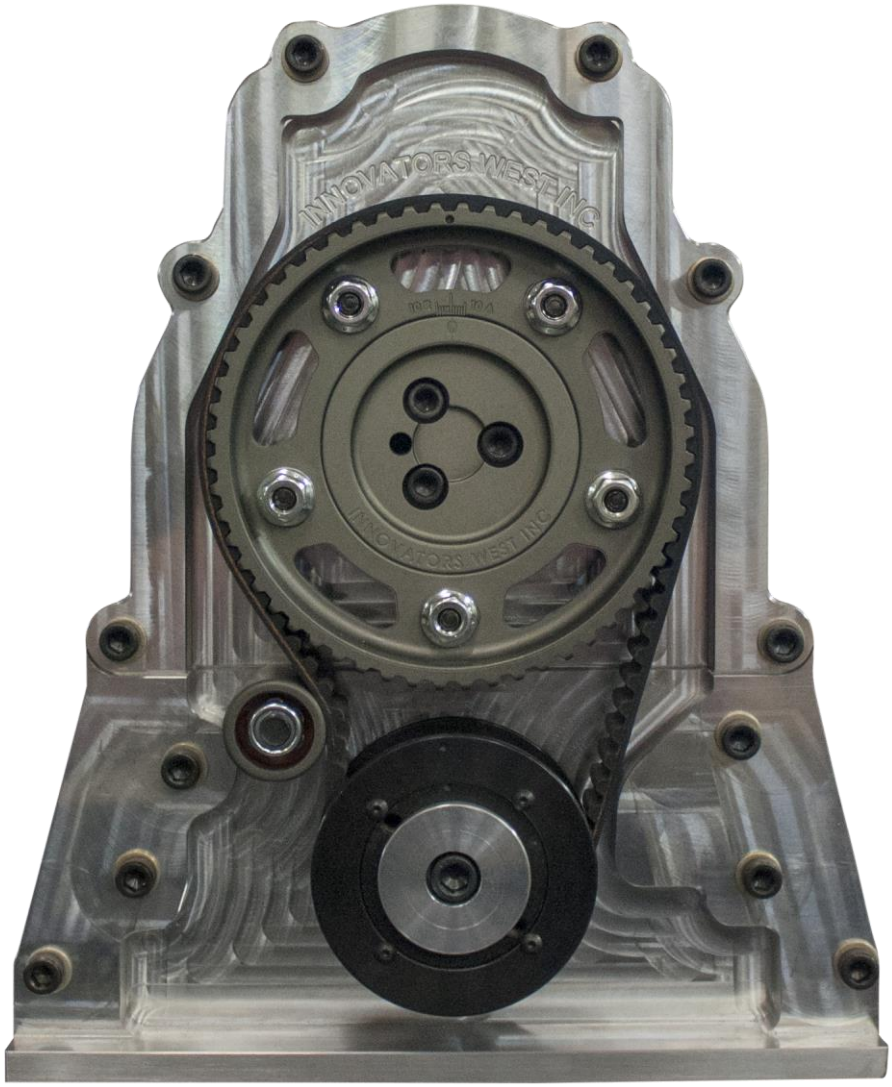
#5200/5201/5202/5203 LSx Belt Drive
Install Instructions



1 – Front Cover

Place the lower cover onto the front of the engine by hand. Make sure that the cover will clear the oil galley plugs, oil pump mounting bosses and will sit flat onto the block. If the cover does not sit flat, check for obstructions and clearance as necessary. Repeat this step with the upper cover, checking for clearance on the water pump mounting locations. Once proper clearance is obtained, install the lower and upper covers using the supplied hardware. Do not tighten front cover bolts until after the lower sprocket and upper sprocket are installed. These sprockets will help center the cover and in doing so will reduce seal wear.

2 – Crankshaft Sprocket

The lower crank sprocket can now be pressed onto the crankshaft. The lower sprocket is machined to fit a stock dimension crankshaft snout (1.4820”). Aftermarket crankshafts can vary; measure the snout OD to verify this measurement. If the crankshaft is greater than the stock measurement the crankshaft sprocket will likely need honed to fit. The lower sprocket will need to be pressed onto the crankshaft snout. Apply some anti-seize or oil to the sprocket and the crankshaft snout before installing. DO NOT hit the crankshaft sprocket directly with a hammer or other blunt object as damage to the sprocket may occur. Aluminum tubing or plastic pipe is often used to fit over the crankshaft snout and into the ID of the crankshaft sprocket. A harmonic damper installation tool is preferred when installing the sprocket. Drive the sprocket onto the crankshaft snout until it comes to rest on the shoulder of the front main journal. If for some reason the sprocket binds or stops before this point, STOP, remove the sprocket, and see what is keeping the sprocket from being fully installed. To remove the sprocket there are provided 1/4”-20 holes tapped in the sprocket to bolt a pulley removal tool into.

3 – Cam Thrust Plate

The belt drive timing system is designed for use with the OEM cam thrust plate. Do not use any other manufacture of cam thrust plate with this system without checking for clearance and proper camshaft thrust.

4 – Cam Drive Hub

Place the roller thrust bearing onto the rear of the drive hub with the rounded side of the bearing facing the cam retainer plate. Using some grease, lubricate the cam seal in the upper cover. Carefully slide the camshaft drive flange and bearing through the seal (slowly and carefully as to not nick or damage the seal) and engage the camshaft. The camshaft may want to push back from the front of the engine. If this is the case, using a large screwdriver, very carefully pry the camshaft to the front of the engine and press the cam hub fully onto the nose of the cam. Included with the timing belt system are new camshaft bolts. Install the bolts dry and lightly tighten to ensure that the bolt will fully engage the camshaft and not bottom out in the cam. Once this is verified, apply some Loc-Tite to the bolts and torque them to 24 ft/lbs.

Once the cam hub is torqued in place you will need to check the camshaft endplay. Using a dial indicator measure the forward and rearward play in the camshaft. The endplay should measure between .001” and .012”. If the endplay is outside of these specifications, please consult your engine builder or call Innovators West and speak to a technical service representative.

5 – Cam Sprocket & Belt

Remove the belt tensioner pulley from the front cover. Rotate the crankshaft until the damper keyway and the TDC dot on the crankshaft pulley are at 12 0'clock. Rotate the camshaft drive hub until the "zero" mark is at the 6 o'clock position. Place the belt over the crankshaft pulley and the cam sprocket. Install the cam sprocket onto the cam drive hub with the TDC markings on the cam sprocket matching the "zero" marks on the cam drive hub. Install the 6 flange nuts onto the cam drive hub and lightly tighten them.

Install the belt tensioner pulley onto the timing cover and prepare to check the belt tension. To check belt tension, you will measure the belt deflection. Belt deflection is measured halfway between the cam sprocket and the crankshaft pulley on the right side (drivers' side) of the engine. With the belt tensioner pulley in place, check for proper belt deflection. On a cast iron block belt deflection should measure between .050-.080" when cold. Aluminum blocks will generally grow more, and the deflection is normally increased to .080-.120" when cold. A slightly larger tensioner pulley is included with this belt drive to increase tension if needed. Once the engine has been run and brought up to temp, belt deflection should be checked and adjusted if needed. Periodic checks are a good idea.

6 – Cam Timing

Cam timing is adjusted by loosening the 6 flange nuts on the cam sprocket and rotating the crankshaft independently of the camshaft to advance or retard the camshaft timing. A socket and ratchet may be used on the camshaft bolt to ensure the cam does not rotate while adjusting the crankshaft position. Initial cam timing should be determined using standard camshaft degree methods. Please consult your engine builder or call Innovators West for technical assistance. Once cam timing is set, tighten, and torque the flange nuts to 18-22 ft-lbs.

NOTE – During initial setup, it is suggested that you have the valve train assembled. This load on the camshaft from the assembled valve train will help preload the belt. When adjusting camshaft timing, always verify that you have adequate piston to valve clearance.

LSx Belt Drive Service Parts:

Replacement Belt (STD Cam Height) – Part # 6004

Replacement Belt (Raised Cam) – Part # 6007

Seal & O-Ring Kit – Part # 6009