



## **Raptor V/R (all models) SIMPLE BELT REPLACEMENT METHOD**

Updated: 01/03/2013

The use of the information in this document does not infer that the person/company/business who receives it has any authority whatsoever to open/rebuild a Raptor Supercharger head unit. The act of rebuilding the Raptor V/R is completely at own risk and carries a high risk of personal injury or damage to engine/vehicle. If unit is damaged during or after reassembly all costs for replacement parts/labour will be your responsibility even if supercharger head unit is inside warranty period.

The Raptor V supercharger appears at first glance to be a very simple design with high serviceability, however do not be lulled into believing this thought. The supercharger has a very exacting reassembly process which must be followed very closely or failure of the charger will be more or less immediate upon being reinstalled onto engine. All costs to repair will be yours.

The supercharger is very easy to disassemble and it is virtually impossible to damage any component during this process if reasonable care is taken. NEVER EVER REMOVE THE ROUND MOUNTING PLATE THAT THE COMPRESSOR COVER MOUNTS TO.

**NEVER USE A HAMMER OR Mallet ON THE SUPERCHARGER AND  
NEVER USE AN IMPACT WRENCH ON ANY PART EITHER EXCEPT TO  
REMOVE PULLEY RETAINING NUT**

**THIS DOCUMENT COVERS BELT REPLACEMENT THE FOLLOWING  
MODELS**

Raptor V - Standard

Raptor V - L light weight internals

Raptor V - UL extremely light weight internals

Raptor V - WCL - Water cooled trans with light weight internals (silent transmission)

Raptor V - WCLV - Water cooled trans with light weight internals and vacuum assist trans (V =vacuum to lower air density in transmission so belt can engage pulleys at less operating temperature at super high speeds)

Common Service Parts	
Belt	Optibelt 5M 375 - 27mm
Low speed bearing	6303 2RS C3 -
High Speed bearing	6202 - RSLTN9/HC5C3WT -

**Tools and locking compounds used during assembly**

3	15/16" or 24mm socket
4	Heat Gun (electric)
6	2 large screw drivers (blade type)
9	Loctite 271/515 - to be applied to outer shell of all bearings prior to reinstallation
11	Loctite cleaner primer 7471 - for cleaning all shafts prior to application of locking compound

**DURING REBUILD – WORK ROOM**  
**TEMPERATURE SHOULD BE 18 – 32celcius**

**SPECIAL NOTE** – THIS DOCUMENT is only relevant to superchargers produced after JUNE 2011 or Supercharger units that have had a service/rebuild after JUNE 2011. All units produced before this date will need bearing replacement as part of belt replacement.

This will be mostly pictorial with some words – shown using no special tools in basic workshop format

Place supercharger on workbench and remove the 24mm nut with impact wrench



Remove drive pulley using a puller – sometimes heat may be needed for pulley to release from shaft easily



Remove key from shaft using side cutters, most efficient – lever key out



Remove pulley spacer – IF your charger has one, some pulleys have integral spacer



Loosen and remove the 6 socket headed screws from front of transmission



Polish/finish the ends of 2 of the long screws so they are flat on the end



Apply grease to polished ends



Take a torch and look into screw hole as shown, turn shaft until you see the peak of a pulley tooth at end of hole



Insert the 2 screws with polished and greased ends into the holes as shown, screw in until they contact the pulley – then stop



Use electric heat gun to heat upper bearing area for 60 seconds at maximum heat setting. Once heated then begin to screw the 2 screws in evenly until front cover is entirely removed



This is what you will now see, fibreglass fibers and rubber belt/dust pieces. Vacuum out all these materials, wear dust mask if allergic to dust



You can now remove the central cowl from the transmission, a few gentle taps with a rubber mallet will assist in loosening this part. The entire drive will now be exposed.



Turn supercharger over and heat rear section in approximate area of the low speed bearing, make the area hot to touch.



Take 2 tools (screwdrivers in this case) and then lift out the low speed shaft assembly



Now clean all belt fibres from all surfaces of the low speed pulley

Check pulleys for wear or damage

Next, clean bearing surfaces with steel wool and acetone to remove loctite. Do same with high speed bearing as well



Take a 2.97mm file and now check every tooth valley (60 of them) with a couple of gentle strokes, you NEED to do this as where the screws contact the pulley during the removal process can leave burrs that will cause the new belt to fail prematurely.

Heat transmission around the bearing area from the front side of rear plate this time

Apply loctite 620 to outer surface of low speed bearing ONLY

Slide belt onto high speed pulley and then work low speed shaft/bearing into the bearing recess in plate while plate is still hot from heating.

Grease the dowels of cowl as shown, refit cowl





Using 7471 primer, clean outer edge/race of bearings and also bearing recesses in front alloy plate of transmission



Bearing recesses being cleaned



Apply loctite 515 to outer edges (only) of both bearings. Never put compound into holes in plate

Heat the entire plate area so its hot to touch (60c - 75c)



Use heat proof gloves, pick up plate and start it onto the small bearing while pushing it away from the large bearing, then push plate down onto large bearing and very quickly work the plate all the way down until it seats onto cowl. NEVER PULL IT ON WITH THE SCREWS

Now insert the 6 screws and hand tighten with a short arm allen wrench.

Fit spacer then key

Align key with key slot in drive pulley

Fit washer then nut



Restrain pulley and tighten nut by hand, never use impact wrench.



Rotate your charger by hand, it should have some drag but not be stiff to turn

Refit charger to vehicle

Run charger in for 60km of easy driving

Check cooling fan is working and pumping cool ambient air, never have fan in engine bay.  
Clean and check air feed hose is not clogged with belt fibres from previous belt failure  
IF VLC – make sure fluid levels are restored and pump is functioning correctly. No fluid circulation will result in a premature failure of the drive.

Check your BOV is open at idle and at cruise speeds, this allows air to circulate and cool charger compressor

If you noticed ANY engine oil inside your charger transmission, fit an oil catch can system. Oil may find its way into the belt drive and subsequently destroy the belt drive.