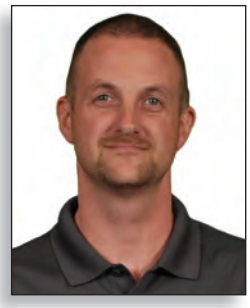
Playing With Pulleys: Jatco CVT



by Jarad Warren
members.atra.com

Figure 1

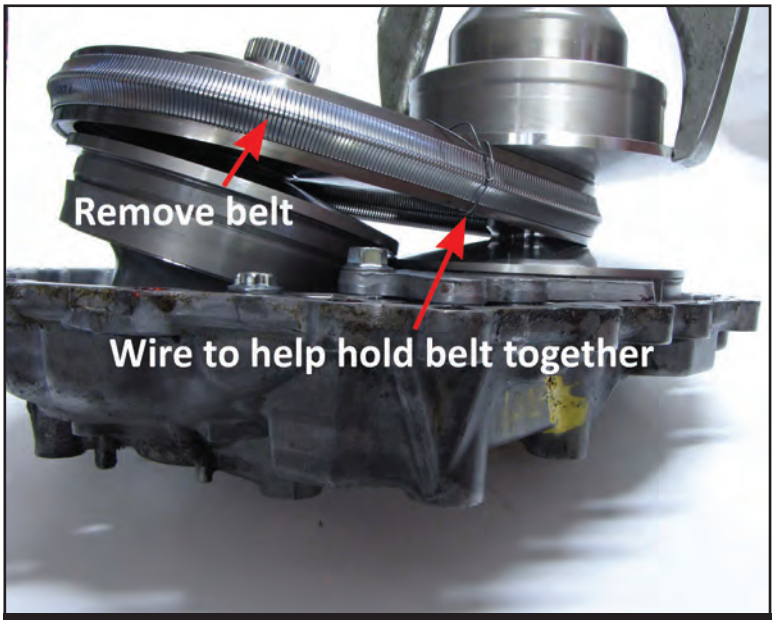


Figure 2

Many shops today have worked or been asked to work on CVTs. The Jatco CVT is used by many different manufacturers, such as Nissan, Mitsubishi, and Chrysler. No doubt about it: CVTs are here and are going to be staying around.

Rebuilding these CVTs has its challenges. Getting parts for them can be an adventure in itself. In some cases the only parts offered are the valve body or a complete transmission from the dealer.

Aftermarket companies have been busy making parts for these units: Rebuild kits, bearings, and CVT belts are now available from several aftermarket companies.

In this article, we're going to look at the Jatco CVT pulleys to take some of the mystery out of them. Many factory manuals don't show the procedures to rebuild them.

Why overlook the pulley assembly? You always rebuild the drums or clutch packs in a regular transmission. The pulleys are like a clutch drum: They have fluid chambers and seals just like a drum and they need to be sealed.

Just because you have the transmission torn down to the two pulleys and belt assembly on the rear cover doesn't mean the job's over. You need to tear down and inspect the components, and replace the seals or damaged parts.

Let's dive in a little deeper and disassemble the pulleys.

Removing the Belt

WARNING: Each pulley has a large spring that applies force to the pulley sheave. The spring applies a lot of pressure to the sheave and you can

HH HEAVY HAULER

"HI, I'M ALLISON"

NAPC.CA

Meet Allison

TOP RATED, TOUGH AS NAILS, HEAVY DUTY

HEAVY HAULER®

Here at North American Powertrain Components we've got the best built heavy duty transmissions on the market. Get the towing power, durability & reliability you need for every day tasks. Call us today to get your hands on an Allison *{ By the way, the pretty model in the photo is Lisa }*

12836-151 ST. EDMONTON, AB - 866.456.4498 - NAPC.CA - LIKE US

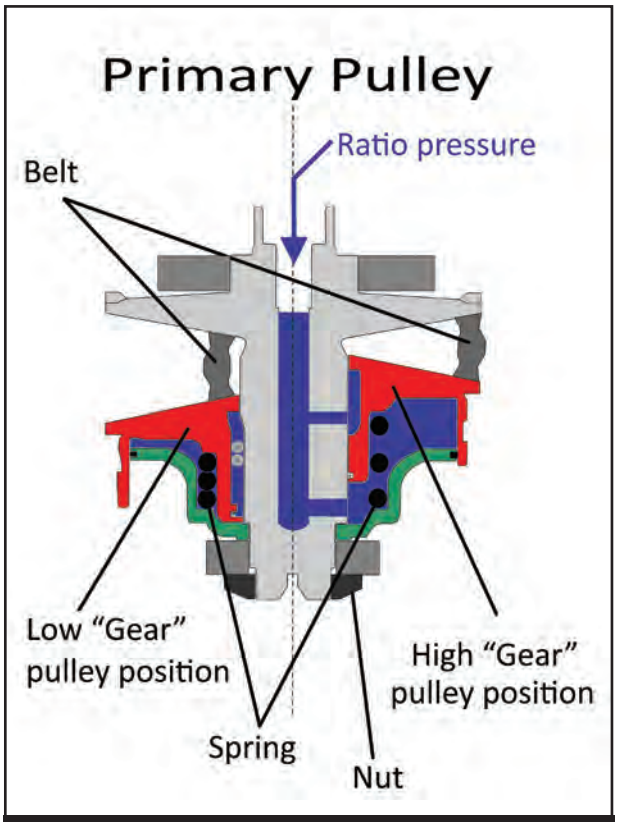


Figure 3

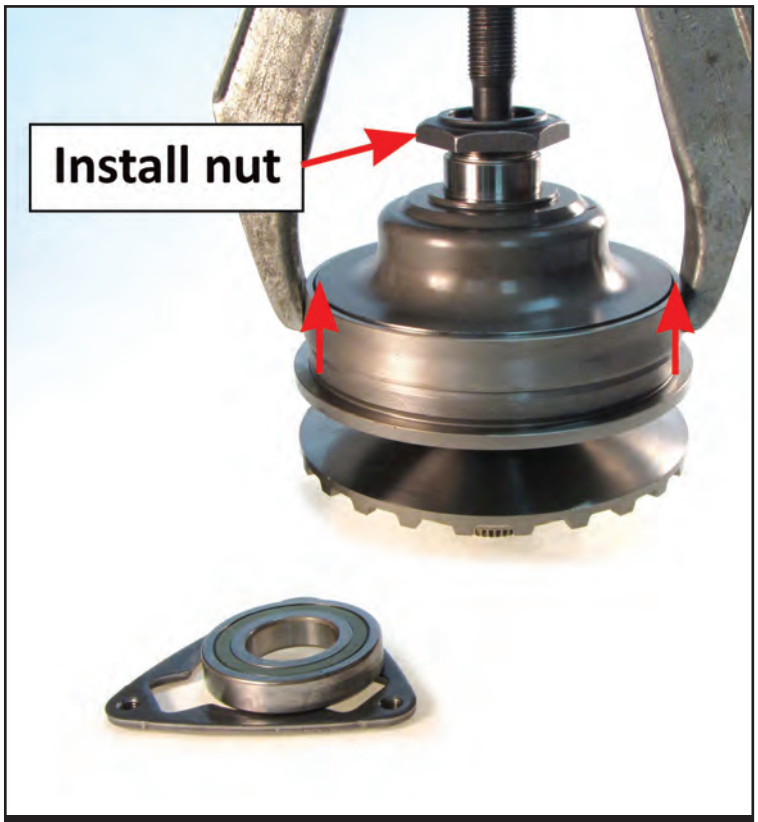


Figure 4

easily get hurt if you slip your fingers between the belt and pulley sheaves.

To remove the belt, you'll need to pull against the spring tension. There are aftermarket tool kits for pulling the pulleys apart. One that works well is an input bearing puller (figure 1), but other pullers will work. The puller must tighten the jaws onto the pulley groove and not slip off.

- Remove the six bolts that retain the pulleys from the back of the cover.
- Notice the direction of the arrow on the belt so you make sure it goes back facing the same direction. A picture with your phone is a quick and easy way to keep track of it.
- Install the puller onto the secondary shaft to grab the outside of the pulley (figure 2). You can put two zip ties or wires around the belt to help hold the belt together.
- With the belt tension released, pull the primary pulley up and tip in toward the secondary pulley: Be careful not to scuff the pulleys.
- Remove the belt and inspect the sides of the belt that ride along the pulley surfaces.

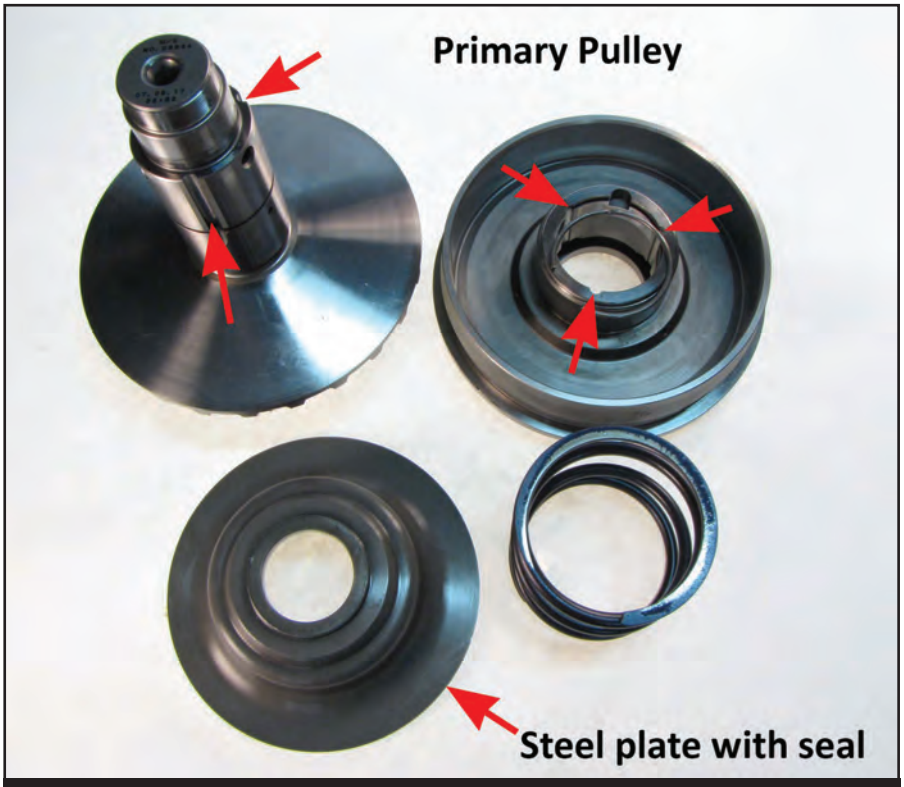


Figure 5

- Pull the secondary pulley straight up and inspect the rear cover bearing pockets for wear.
- Remove the puller from the secondary pulley.

Inspect both pulley surfaces and the bearings on each end of the pulleys. If the pulleys are in good shape, you're ready to pull them apart and rebuild them.

Horsepower for an Hour

Your Ultimate Stop in Automotive Radio

The Hottest Automotive Talk Radio Show in the Nation

"When I'm not accelerating from 0 to 340 miles an hour in 4 seconds, I'm listening to Horsepower for an Hour"

---- Fast Jack Beckman

Horsepower for an Hour is the Official ATRA Radio Network

ATRA
AUTOMATIC TRANSMISSION REBUILDERS ASSOCIATION

www.horsepowerforanhour.com

Figure 6

Primary Pulley

The primary pulley is fairly simple (figure 3). It consists of two sheaves: one that's fixed and one that slides as the ratio changes. It uses six, 6mm balls — two balls in each groove — that act as a spline to keep the sheave from rotating on the fixed pulley.

The sliding sheave receives constant pressure from a large spring retained under a steel plate. The plate is pressed onto the shaft and contains a hard plastic seal ring.

Primary Pulley Disassembly

To disassemble the primary pulley:

- Remove the primary pulley nut with a 55mm socket; it uses normal, right-hand threads.
- With a puller, remove the bearing and bearing plate, and reinstall the nut for safety (figure 4).
- Use a puller that can lock onto the side of the sliding sheave and remove the pressed-on plate. When putting pressure on the puller it'll stop when the sheave bottoms out on the steel plate; keep going to pull against the pressed-on plate. This takes a lot of force and, when it comes undone, the steel plate will spring up to the nut.
- Remove the puller, press down on the steel plate, and remove the nut.
- Carefully slide the sheave up: Don't lose the six balls.

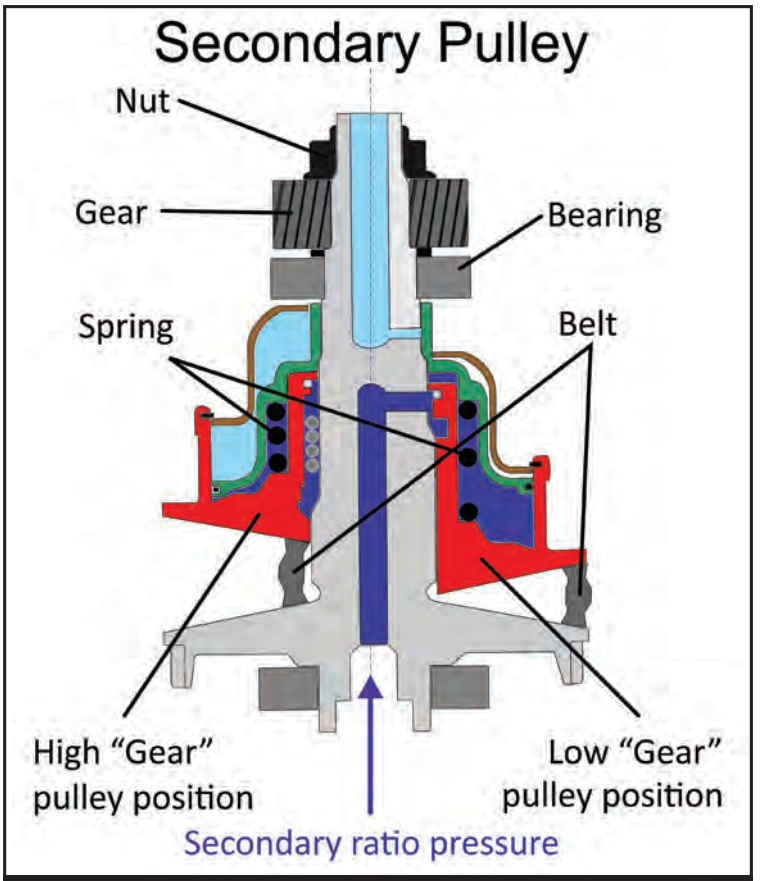


Figure 7

- Clean all parts and inspect the area the seal rides in and the surface it seals against. Look for pitting, nicks, and scratches.
- Remove the round snap ring from the sliding sheave.
- Inspect the six balls and the grooves they ride on (figure 5).

Primary Pulley Assembly

Installation is pretty straightforward:

- Install the pulley halfway onto the shaft.
- Install two balls into each groove, then reinstall the round snap ring.
- Allow the pulley to slide down.
- Lube the seal surface, then install the large spring.
- Place a new seal ring on the steel plate and put it into the press. Make sure you press the steel plate on flat (figure 6).
- Install the bearing retainer.
- Press the bearing back on and torque the nut to 200 lb-ft.

Secondary Pulley

The secondary pulley is just like the primary pulley but has an added lube/balance circuit and a gear (figure 7).

It also has twelve, 6mm balls for the splines instead of six. The secondary pulley has a larger spring than the primary pulley.

Secondary Pulley Disassembly

- Remove the nut with a 40MM socket: It uses normal, right-hand threads. Then reinstall nut for safety so the spring and steel plate don't fly apart when pulling them off.
- With the puller, remove the gear and bearing.
- Install a puller on the outside pulley and tighten it until the spring compresses.
- Remove the snap ring to the balance piston (figure 8).
- With the snap ring removed, keep pulling on the pulley until it comes apart.
- Remove the nut, balance retainer, steel seal plate, spring, and pulley sheave. Don't lose the twelve, 6mm balls when you lift the pulley off the sheave.

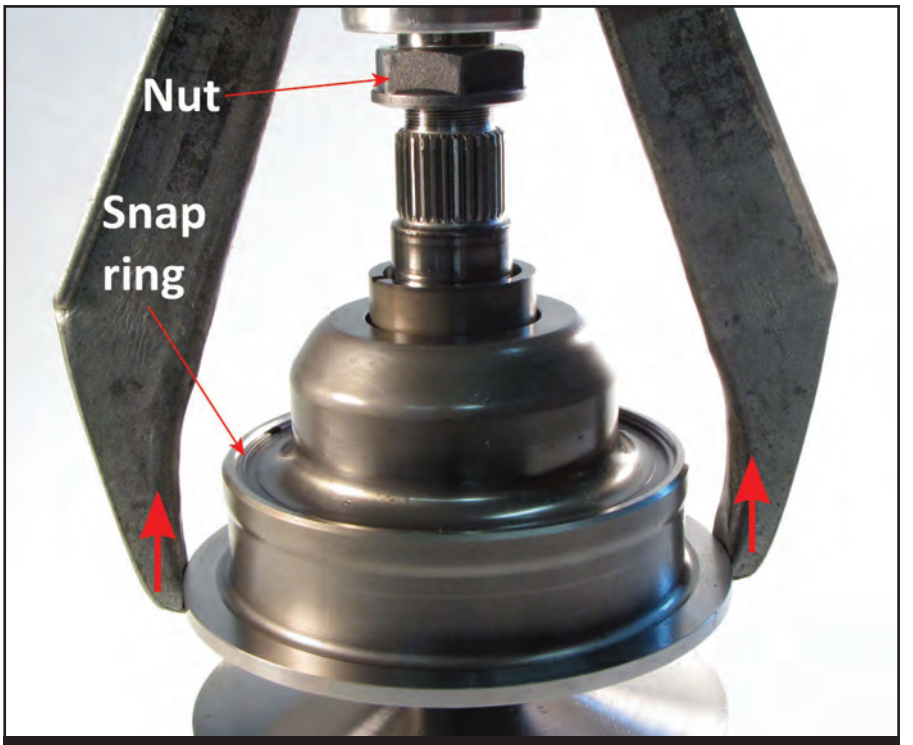


Figure 8

Clean all parts and inspect the sheave surfaces, seal surface, and grooves for the balls (figure 9). Look for pitting, scratches, and dings in the surfaces. Make sure the bearing and gear are in good shape.

Remove the round snap ring from the sheave and inspect the areas the balls ride on. If there are indents or rough areas in the groves, they can cause chattering, noise, and broken belts.

Figure 9

Secondary Pulley Assembly

During assembly, it's important to lube all the parts.

- Assemble the sheave halfway down.
- Install the four, 6mm balls into each groove — a total of twelve.
- Install the round snap ring that keeps the balls in place and push the sheave all the way down.
- Install the spring and a new seal ring on the steel plate.
- Place the balance retainer and snap ring on the top.

THE FUTURE OF TECHNICAL TRAINING

REGISTER NOW!

FREE* WEBINAR

August 5&6
65-66RFE
Introduction

August 19&20
62TE Updates

Join ATRA as we boldly leap into the future of professional online training with industry trend-setting technical content you can access anywhere.

A special 'Thank You' to Seal Aftermarket Products, a driving force behind innovative education and for their continual support in promoting the betterment of the industry.

HOW TO PARTICIPATE:
Login at http://members.atra.com and click on the webinar schedule. Once registered, you will receive an email confirming your registration along with information you need to join the webinar.

*Free for everyone on the day of the webinar. ATRA Members have access to all pre-recorded webinars.

SEAL AFTERMARKET PRODUCTS

your source for engineered solutions

This and other technical webinars were made possible by;

Seal Aftermarket Products engineers and manufactures the Toledo Trans-Kit brand, the most trusted and complete kits in the industry for the past 25 years. NEW WEB ADDRESS www.sealsap.com

- Using a press, push straight down on the steel plate until it bottoms out (figure 10).
- Install the snap ring on top of the balance retainer. There are no seals on the retainer.
- Install the inter-bearing race with the lip facing down (figure 11). Slide the bearing on, followed by the bearing washer.
- Press the gear on with the lip facing down toward the pulley.
- Torque the nut to 185 lb-ft.

Installing the Belt

After you have both pulleys rebuilt, you're ready to install them on the rear cover with the belt. To do this, you'll need to spread the primary pulleys. There are two easy methods for this.

Method 1:

- Install the puller on the primary pulley and spread the pulley.
- Install a small block of wood between the pulley and zip-tie it into place.
- Release the puller and install the pully into the rear cover.

Method 2 (this one takes a little longer):

- Install the primary pulley into the rear cover.
- Apply vacuum to the shaft to spread the pulleys. You need a vacuum pump with a large, 3-CFM rating or more.
- Spread the secondary pulley with the puller to get the belt back on.
- Start the belt on the secondary pulley, making sure the direction is the same as it was when you removed it.
- Tip the secondary pulley toward the primary pulley and install the belt.
- Install the secondary pulley into position and remove the block of wood or vacuum to release primary pulley.
- Remove the puller from the secondary pulley.

…and that's all there is to it.

Hopefully this has taken some of the mystery out of the pulley construction and rebuilding procedures. With this information, you should be able to build a profitable Jatco CVT.

Special thanks to Perfection Plus Transmission Parts in Portland Oregon for the use of the transmission core.

Figure 10

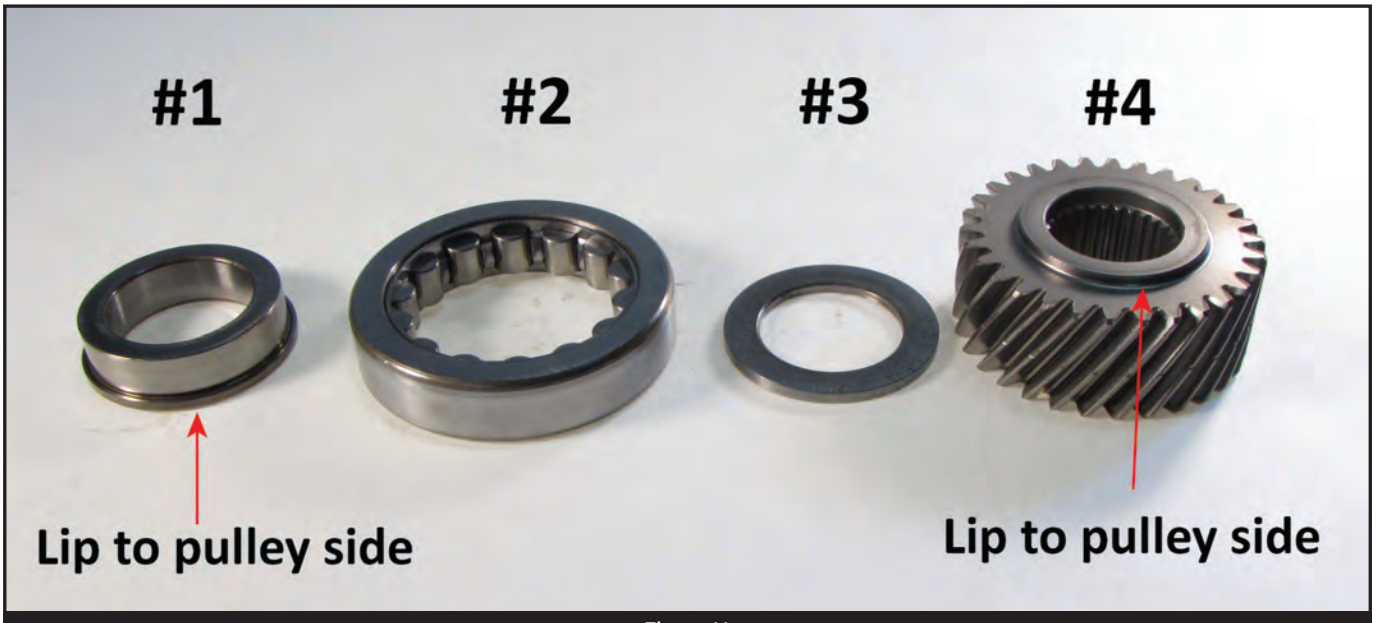


Figure 11

ALL WE DO ARE TRANS-MISSIONS ARE ALL WE DO.

Your goal is to make your transmission shop more successful, and ours is to help you do it. As the world's largest and strongest trade organization of transmission rebuilders, **ATRA** is your premier source for transmission problem-solving and repair information. A partnership with **ATRA** means profit for you.

JOIN TODAY AT

▶ ***MEMBERS.ATRA.COM // 1-866-GO-4-ATRA***

ATRA
AUTOMATIC TRANSMISSION REBUILDERS ASSOCIATION