04 Continuously Variable Transmission (CVT)

Continuously Variable Transmission (CVT)

SERVICE TOOLS

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SERVICE PRODUCTS

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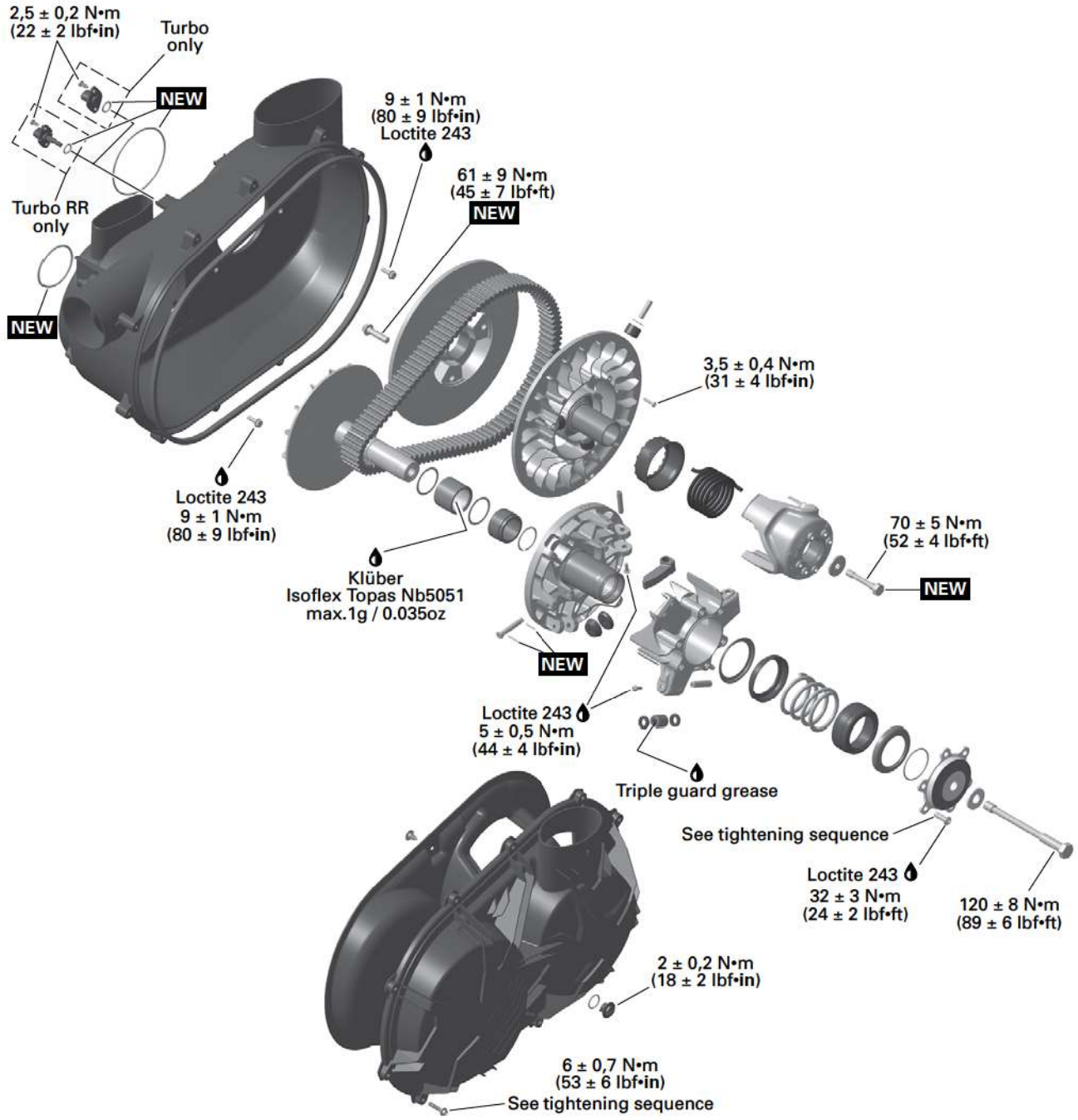


NEW = Component must be replaced when removed.

General

NOTE: For a better understanding, the following illustrations are taken with engine out of vehicle. To perform the following instructions, it is not necessary to remove engine.

This CVT is lubrication free. Never lubricate any components except drive pulley hub.

⚠ WARNING

Never touch CVT while engine is running. Never drive vehicle when CVT cover is removed.

⚠ WARNING

Any drive pulley repairs must be performed by an authorized Can-Am dealer. Subcomponent installation and assembly tolerances require strict adherence to procedures detailed.

⚠ WARNING

The clutch assembly is a precisely balanced unit. Never replace parts with used parts from another clutch assembly.

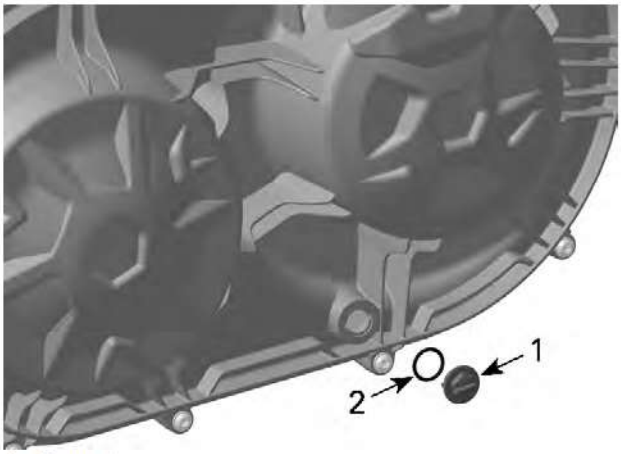
Procedures

CVT Cover

Draining the CVT Cover

If water is present in CVT cover, it can be drained as follows:

1. Turn bayonet cap 90° counterclockwise to open it.
2. Remove bayonet cap and O-ring.



1. Bayonet cap
2. O-ring

3. Let water drain from CVT cover.
4. Reinstall bayonet cap and O-ring.

Tightening Torque	
Bayonet cap	2 ± 0.2 N·m (18 ± 2 lbf·in)

NOTICE

If any debris entered the CVT cover, CVT must be cleaned and inspected.

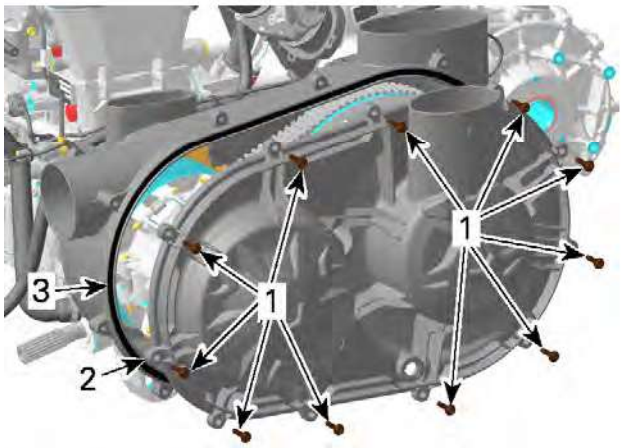
Removing the CVT Cover

1. Detach CVT hoses from CVT cover.
2. Remove the CVT cover.

NOTE: Remove the center top screw last to support the cover during removal.

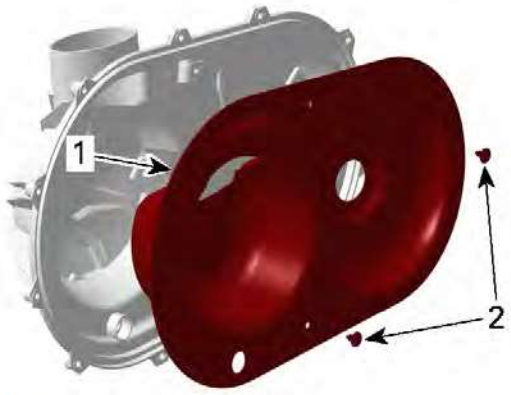
NOTICE

Do not use and impact tool to remove CVT cover screws.



1. Retaining screws
2. CVT cover
3. Gasket

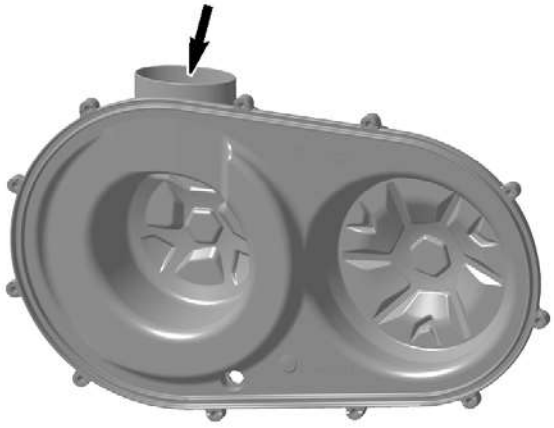
3. If required, remove the insulating mat by removing the trim buttons (2 x).



1. *Insulating mat*
2. *Trim buttons*

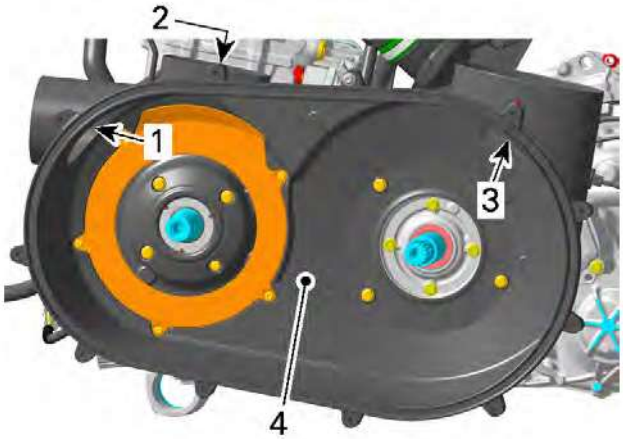
Cleaning the CVT Air Inlet/Outlet

1. Remove CVT cover.
2. Inspect and clean the air inlet and outlet openings from inside the CVT cover.



TYPICAL - CVT COVER - CVT INLET OPENING

3. Inspect and clean the air inlet and outlet openings from inside the inner CVT air guide.



1. *Air inlet opening*
2. *Air inlet opening*
3. *Air outlet opening*
4. *CVT air guide*

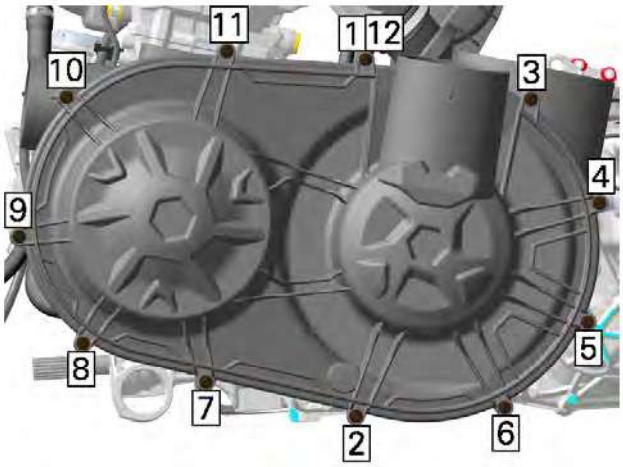
4. Inspect and clean the end of air outlet duct at rear of the vehicle.

NOTE: If a lot of debris or grime are found in the CVT system, it may be necessary to remove the ducts and thoroughly clean them.

5. Reinstall CVT cover.

Installing the CVT Cover

1. If removed, install the insulating mat.
2. Install the center top screw first.
3. Tighten the CVT cover retaining screws as per following sequence.



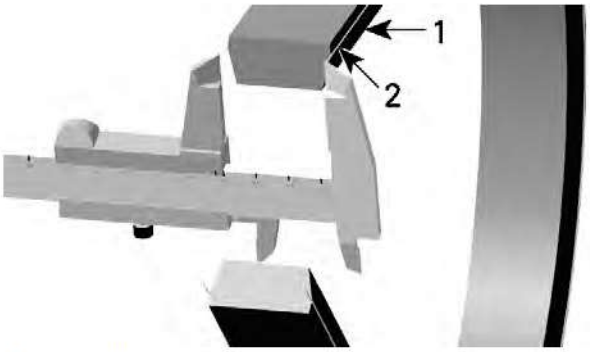
Tightening Torque	
CVT cover screws	6 ± 0.7 N·m (53 ± 6 lbf·in)

Drive Belt

Inspecting the Drive Belt

1. Inspect belt for cracks, fraying or abnormal wear. Replace if necessary.
2. Check drive belt width at cord level.
3. Replace if it is out of specification (see table below).

Drive Belt Width	
Service limit	34.7 mm (1.366 in)



1. Drive belt
2. Cord in drive belt

Removing the Drive Belt

NOTICE

In case of a drive belt failure, the CVT, cover with insulating mat and air outlet must be cleaned.

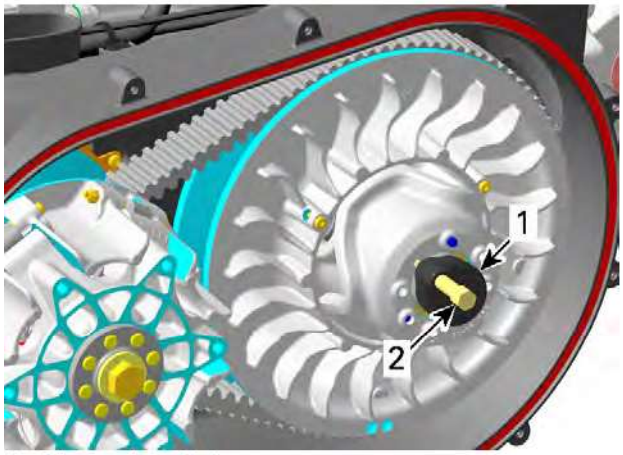
1. Remove the CVT cover.
2. Screw in the driven pulley adapter into the driven pulley shaft.

Driven pulley adapter (P/N 708200720)	

3. Screw in the puller/locking tool into the threaded offset hole of the adapter.

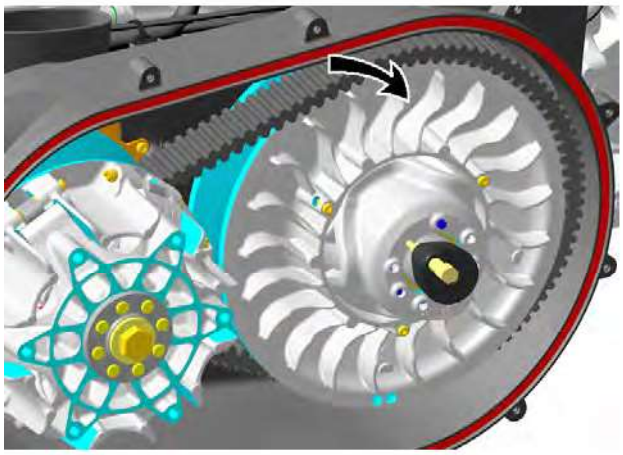
Puller/locking tool (P/N 529000088)	

4. Tighten the puller/locking tool to open the pulley.



1. Driven pulley adapter
2. Puller/locking tool

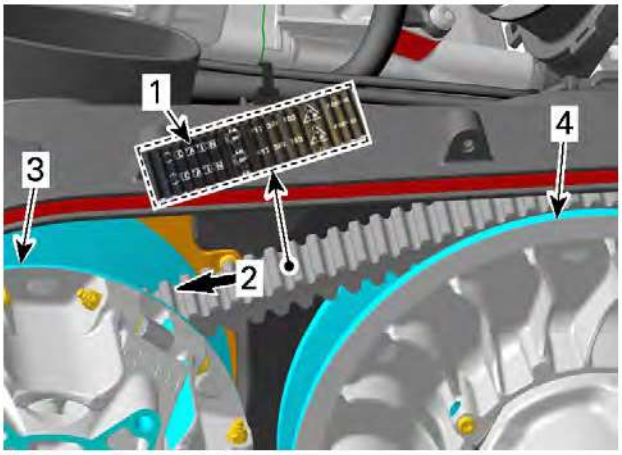
5. Slip the belt over the top edge of fixed sheave, as shown.



Installing the Drive Belt

The installation is the reverse of the removal procedure. However, pay attention to the following.

1. The maximum drive belt life span is obtained when the drive belt has the proper rotation direction. Install it so that the arrow printed on belt is pointing towards front of the vehicle, viewed from top.

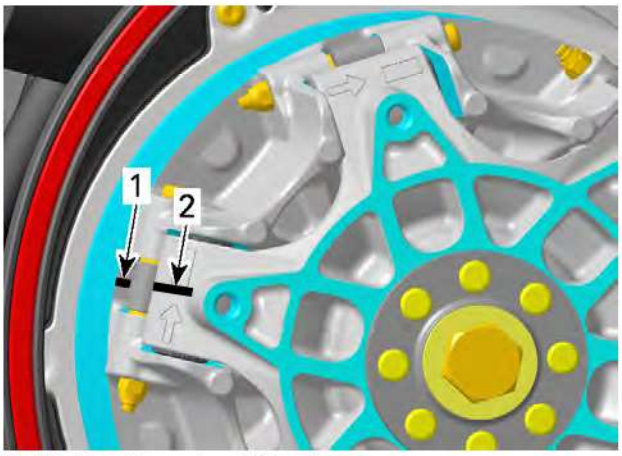


1. *Arrow printed on belt*
2. *Rotation direction*
3. *Drive pulley (front)*
4. *Driven pulley (rear)*

Drive Pulley

Removing the Drive Pulley

1. Remove the drive belt.
2. Prior to removing the drive pulley, mark sliding sheave and governor cup to ensure correct indexation at reinstallation.



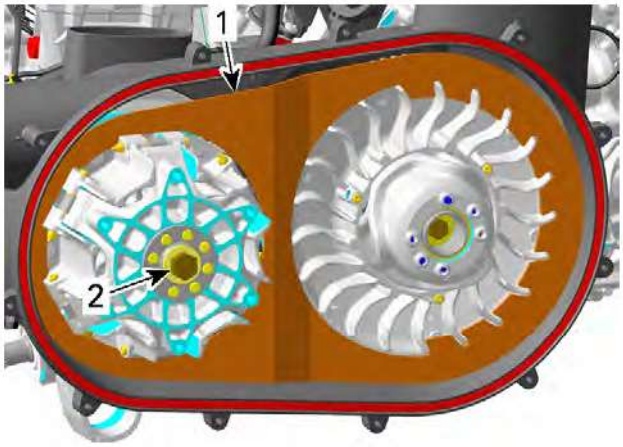
1. *Mark on drive pulley sliding sheave*
2. *Mark on governor cup*

3. Lock the drive pulley.

Clutch holder (P/N 529036432)	

4. Loosen the drive pulley screw. Do not unscrew the drive pulley screw completely.

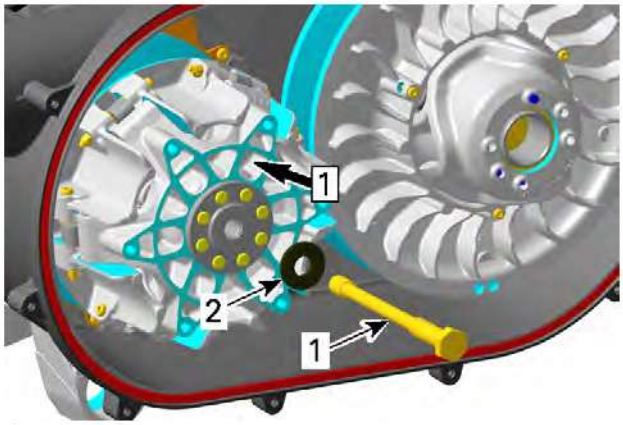
NOTICE
Never use any type of impact wrench for drive pulley removal.



1. *Clutch holder*
2. *Drive pulley screw*

5. Remove service tool.
6. Apply axial pressure with your hand on the governor cup until clutch puller for removal is installed.
7. Remove the drive pulley screw and its spring washer.

⚠ CAUTION
Sliding sheave of drive pulley is spring loaded.

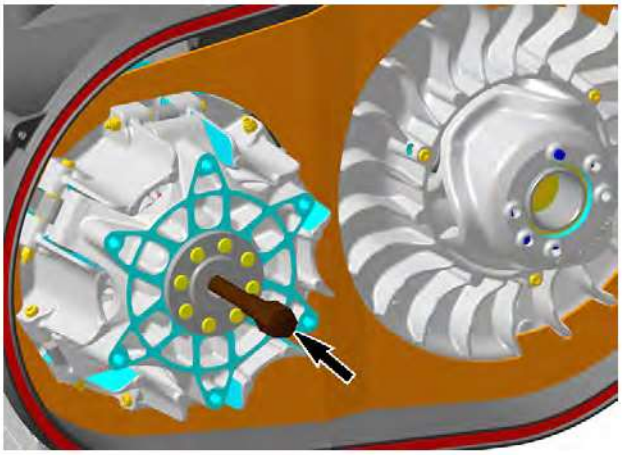


Step 1. Push
1. *Drive pulley screw*
2. *Spring washer*

8. Screw clutch puller in fixed sheave to remove drive pulley.

Drive pulley puller (P/N 529000064)	

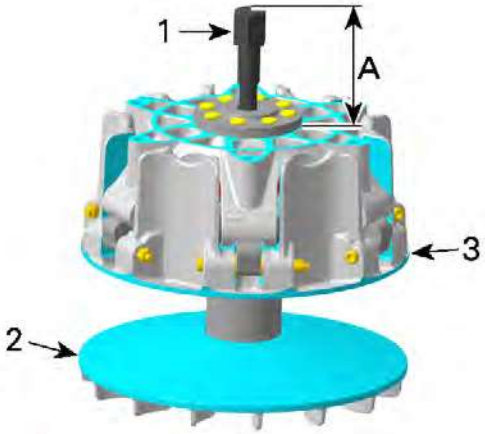
NOTICE
Use only recommended tool.



Disassembling the Drive Pulley
Drive Pulley

1. Screw the drive pulley puller into fixed sheave shaft (maximum protrusion of 63 mm (2-1/2 in)).

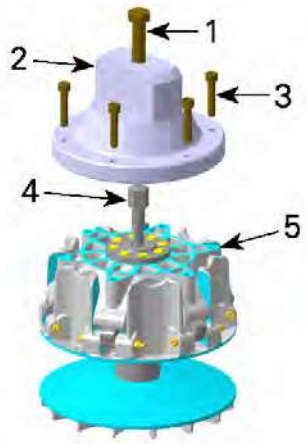
Drive pulley puller (P/N 529000064)	



A. Maximum protrusion of 63 mm (2-1/2 in)
1. Clutch puller
2. Fixed sheave
3. Sliding sheave

2. Place the governor cup puller on governor cup.

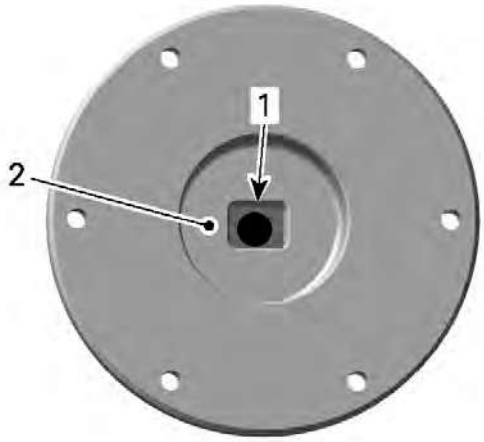
Governor cup puller (P/N 529036350)	



1. M16 x 80 puller screw
2. Governor cup puller
3. M8 x 35 puller retaining screws
4. Clutch puller
5. Governor cup

NOTICE

Ensure that the hexagonal head of the clutch puller engages in the slot of the governor cup puller.



1. Slot
2. Inner side of puller

3. Tighten M8 x 35 puller retaining screws.

Tightening Torque	
M8 x 35 puller retaining screws	20 ± 2 N·m (15 ± 1 lbf·ft)

4. Put the governor cup puller into a vice and screw in the M16 x 80 puller screw.

SCREW IN M16 X 80 PULLER SCREW

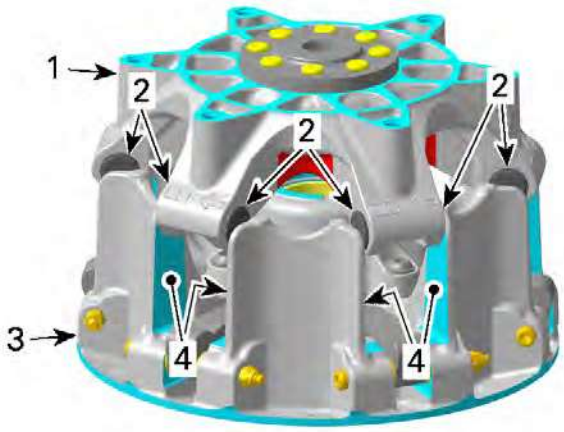
⚠ CAUTION

The fixed sheave will bounce up.

5. Remove the governor cup puller from the drive pulley.

Governor Cup

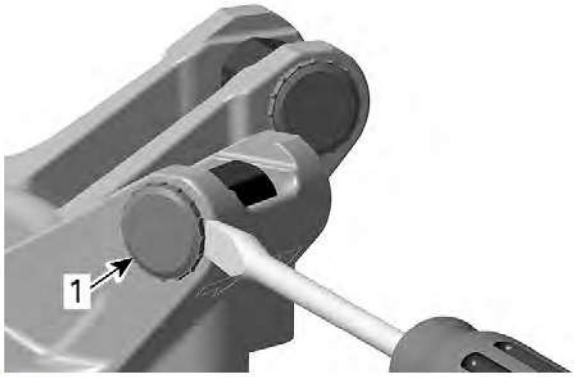
1. Carefully lift governor cup until slider shoes come at their highest position into guides.



1. *Governor cup*
2. *Slider shoes*
3. *Sliding sheave*
4. *Guides*

NOTE: The following procedure is not necessary except if roller must be removed. Refer to *Inspecting the Drive Pulley* before proceeding.

2. Remove slider shoes out of each bearing sleeve. Use a flat screwdriver if necessary.



1. *Slider shoe*

3. Put governor cup on a vice to push out bearing sleeve of roller in the foreseen direction (against arrow). Use an appropriate punch (diameter of punch must be smaller than the bearing sleeve diameter).

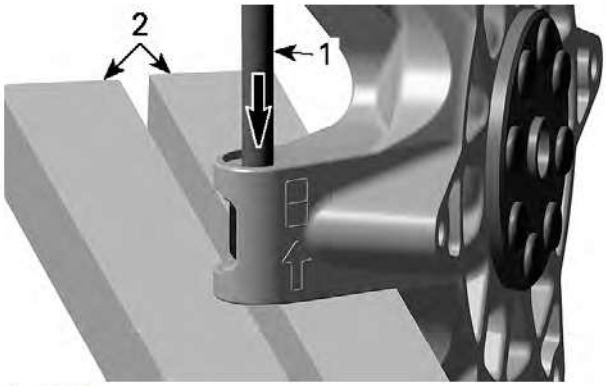
NOTICE

Do not clamp the governor cup in the vice to push out bearing sleeve. Governor cup will be damaged.

Use protection plates to avoid marks and/or damages to the governor cup.

NOTICE

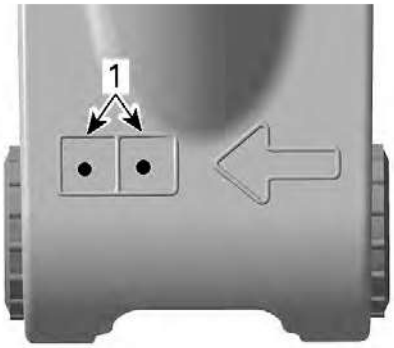
Always replace all rollers at the same time. Partly worn rollers may cause damage to the CVT system.



1. *Punch*
2. *Vice*

1. *Removal direction*
2. *Assembly direction*

Whenever removing a governor cup with already two marked boxes replace it by a **NEW** one.



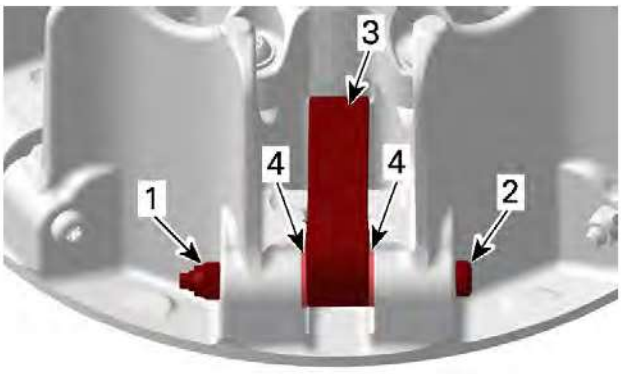
1. *Marked boxes*

Sliding Sheave

This drive pulley is equipped with 6 levers.

NOTE: The following procedure is not necessary except if centrifugal lever must be replaced, refer to *Centrifugal Lever* in *Inspecting the Drive Pulley* before proceeding.

1. Remove the centrifugal levers.



1. *Lock nut*
2. *Centrifugal lever pivot bolt*
3. *Centrifugal lever*
4. *Thrust washers*

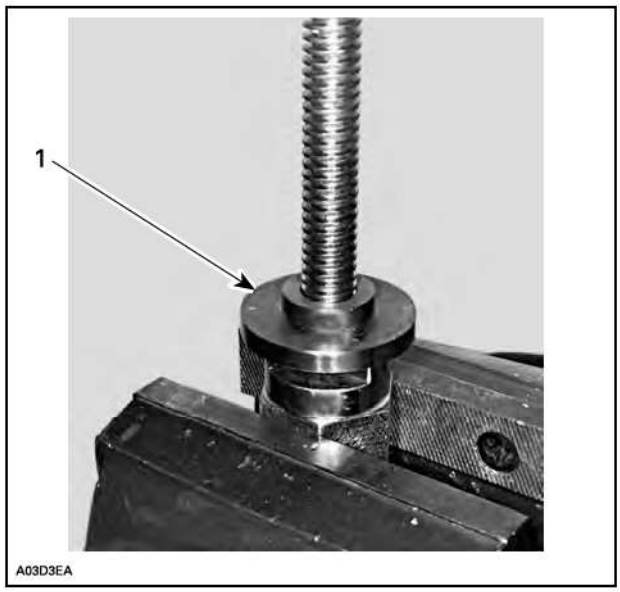
2. Remove spring cover.

Pulley spring compressor tool (P/N 529036012)	

⚠ WARNING

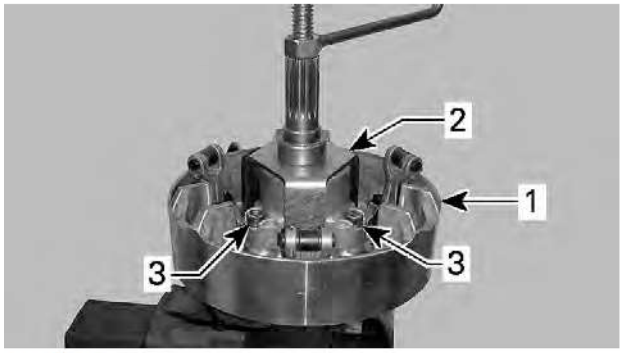
Spring cover is under high clutch spring preload. Never attempt to remove spring cover without the recommended tools.

3. Install support guide of spring compressor in a vice.



NOTE: The support guide will prevent bushing damage.

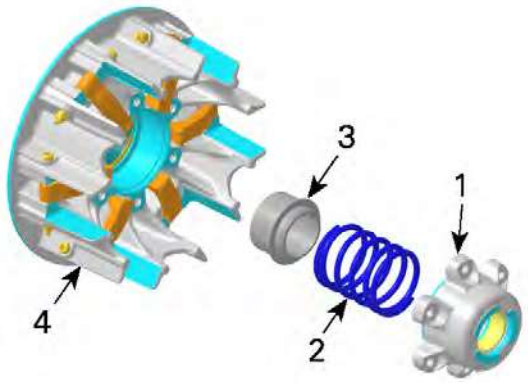
4. Place sliding sheave on support guide.
5. Place support cup over spring cover and tighten nut.
6. Remove spring cover screws.



TYPICAL

7. Remove service tool.

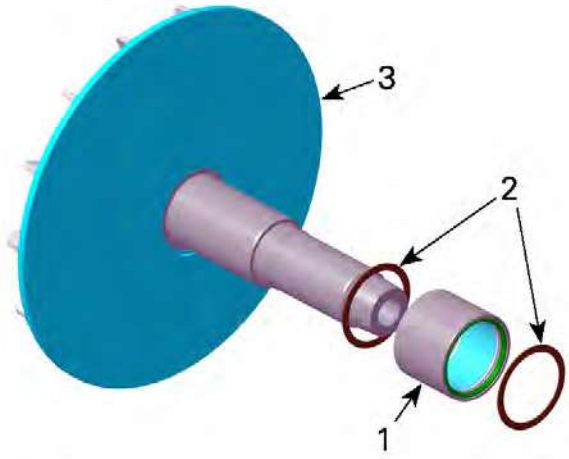
8. Remove the following components from the sliding sheave.



1. *Spring cover*
2. *Spring*
3. *Spring seat*
4. *Sliding sheave*

Fixed Sheave

1. Remove the following components from the fixed sheave.



1. *Hub bearing*
2. *Thrust washers*
3. *Fixed sheave*

Cleaning the Drive Pulley

1. Clean pulley faces and shaft with fine steel wool and dry cloth.
2. Using a paper towel with cleaning solvent, clean:

Clutch and pulley flange cleaner PRO S1

- Crankshaft tapered end
- Crankshaft threads
- Taper on the fixed sheave
- Threads of drive pulley screw.

NOTICE

Avoid contact between cleaner and crankshaft seal because damage may occur.

3. Remove all hardened oil deposits that have baked on crankshaft and pulley tapered surfaces with coarse or medium steel wool and/or sand paper no. 600.

NOTICE

Do not use any other type of abrasive.

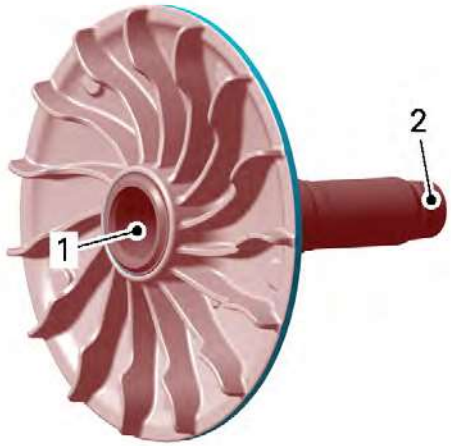
4. Reclean mounting surfaces with paper towel and solvent.

Clutch and pulley flange cleaner PRO S1

5. Wipe off the mounting surfaces with a clean, dry paper towel.

NOTICE

Mounting surfaces must be free of any oil, cleaner or towel residue.

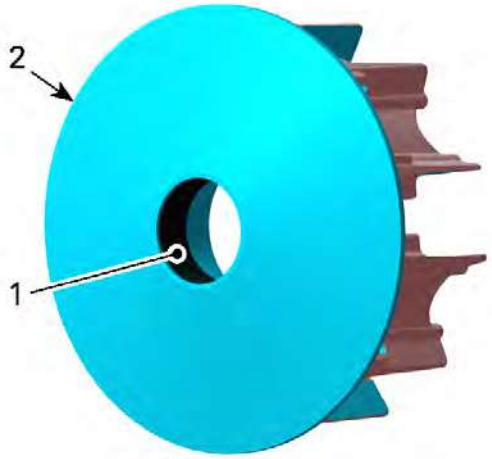


1. *Taper of fixed sheave, crankshaft side*
2. *Tapered end of fixed sheave shaft*

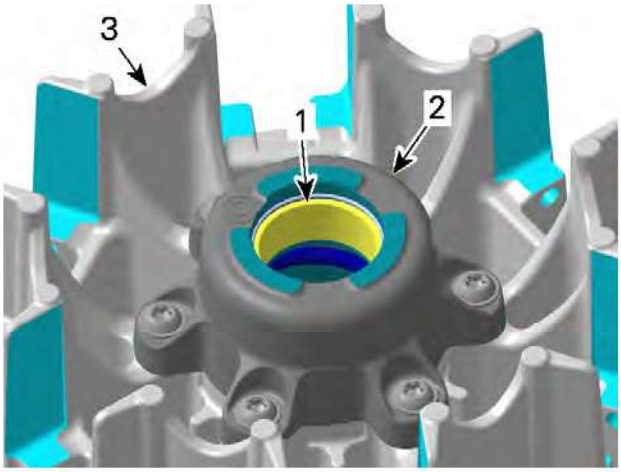
6. Only use petrol base cleaner when cleaning bushings of sliding sheave.

NOTICE

Do not use acetone to clean bushing.



1. *Bushing*
2. *Sliding sheave*



1. *Bushing*
2. *Spring cover*
3. *Sliding sheave*

Inspecting the Drive Pulley Bushings

1. For bushing inspection, refer to *Sliding Sheave and Spring Cover*.

Governor Cup

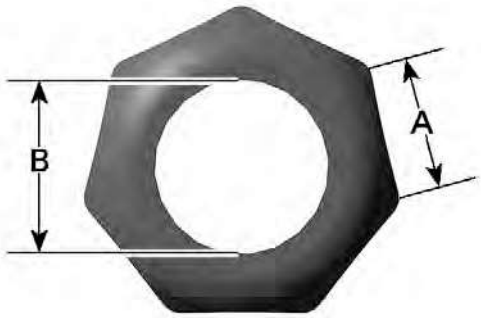
1. Check governor cup for cracks or other visible damage.
2. Replace if necessary.

Hexagonal Roller

NOTICE

Whenever replacing rollers and slider shoes, always replace all rollers and slider shoes at the same time.

1. Check if rollers move freely.
2. Check roller outer width and inner diameter.
3. Replace if it is out of specification.



A. Roller flat spot width
B. Roller inner diameter

Hexagonal Roller Flat Spot Width	
Service limit	8.50 mm (.335 in)

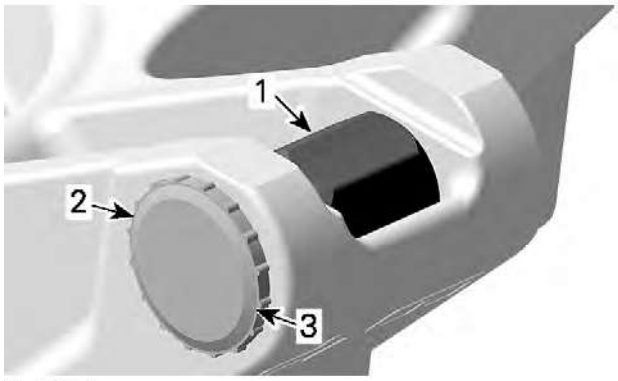
Roller Inner Diameter	
New	8.025 to 8.175 mm (.3159 to .3219 in)
Service limit	9.000 mm (.3543 in)

Sliding Sheave and Slider Shoes

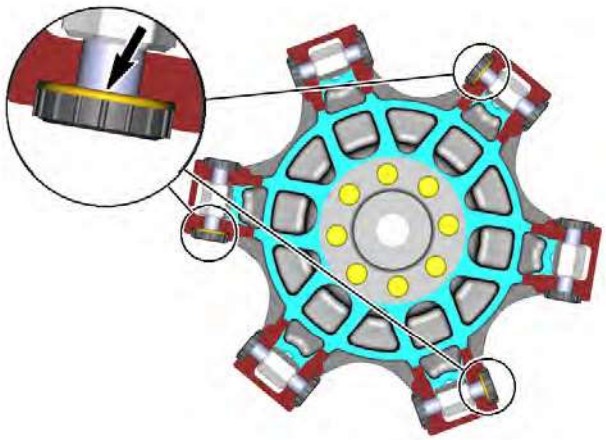
NOTICE

Always replace all slider shoes and O-rings at the same time.

1. Check slider shoes for visible wear. If chamfer is worn out, replace slider shoes and O-rings.

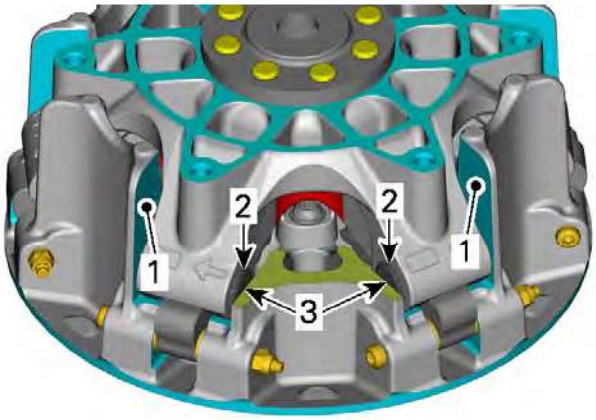


1. *Roller*
2. *Slider shoe*
3. *Chamfer*



3 O-RINGS AT 120°

2. Measure the gap between slider shoes and guides with slider shoe at their lowest position into guides

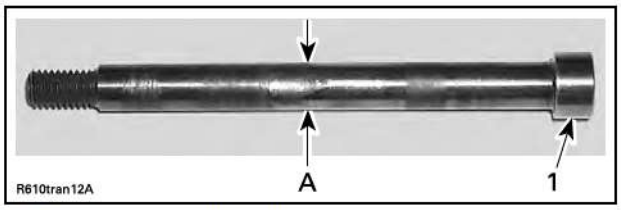


SLIDER SHOES AT LOWEST POSITION
1. *Guides*
2. *Slider shoes*
3. *Measure here*

Gap Between Slider Shoes and Guides	
Up to 0.2 mm (.0079 in)	Inspect occasionally
0.2 to 0.35 mm (.0079 to .0138 in) with old slider shoes	Replace slider shoes
Over 0.35 mm (.0138 in) with new slider shoes	Replace governor cup and sliding sheave

Centrifugal Lever Pivot Bolt

1. Measure diameter of centrifugal lever pivot bolt, replace if it is out of specification.

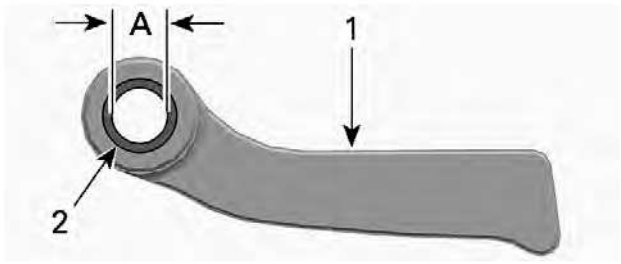


1. *Centrifugal lever pivot bolt*
A. *Measure diameter here*

Centrifugal Lever Pivot Bolt Diameter	
New	6.063 to 6.091 mm (.2387 to .2398 in)
Service limit	6.000 mm (.2362 in)

Centrifugal Lever

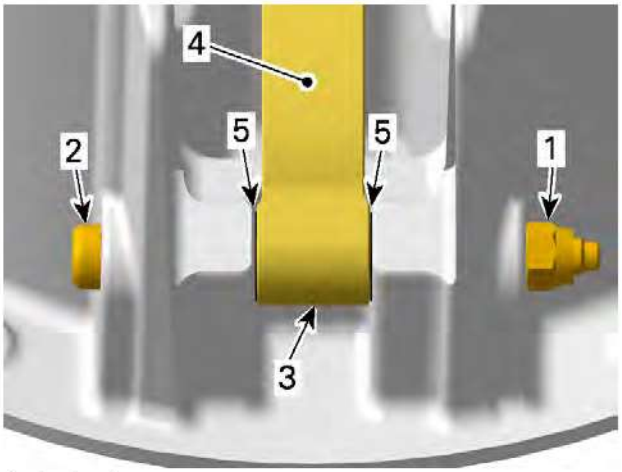
1. Check bushing diameter in the centrifugal lever for wear. Replace centrifugal lever if necessary.



TYPICAL
1. *Centrifugal lever*
2. *Bushing*
A. *Bushing inner diameter*

Centrifugal Lever Bore Diameter	
New	6.000 to 6.120 mm (.236 to .241 in)
Service limit	6.200 mm (.244 in)

2. Replace centrifugal lever, thrust washers, centrifugal lever pivot bolts and lock nuts if the contact surfaces show heavy visible wear.



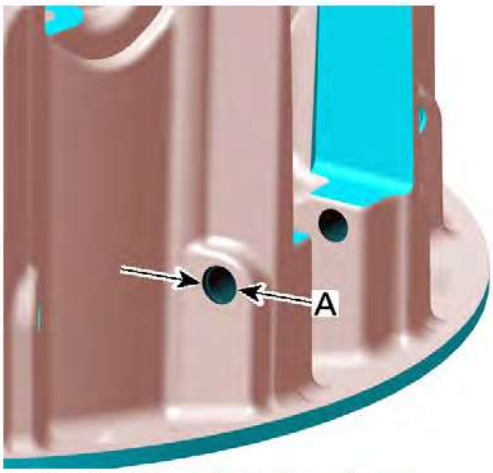
1. *Lock nut*
2. *Centrifugal lever pivot bolt*
3. *Centrifugal lever*
4. *Contact surface to the roller*
5. *Thrust washers*

NOTICE

Whenever replacing centrifugal levers, always replace all lever at the same time. Otherwise, unbalanced drive pulley will occur because of levers difference.

Sliding Sheave and Spring Cover

1. Check sliding sheave for cracks and sliding contact surface for excessive wear.
2. Replace sliding sheave if necessary.
3. Measure centrifugal lever pivot bolt bores.
4. Replace sliding sheave if bores are out of specification or otherwise damaged.

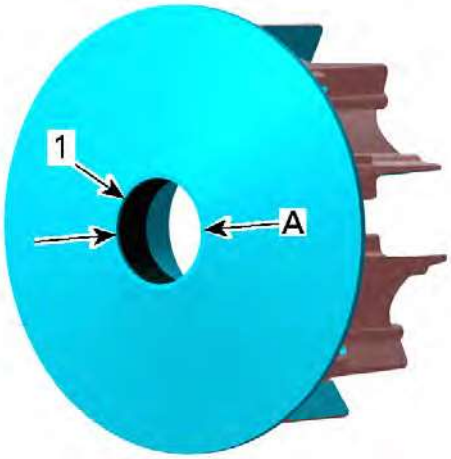


A. Centrifugal lever pivot bolt bore diameter

Centrifugal Lever Pivot Bolt Bore Diameter	
New	6.113 to 6.171 mm (.241 to .243 in)
Service limit	6.300 mm (.248 in)

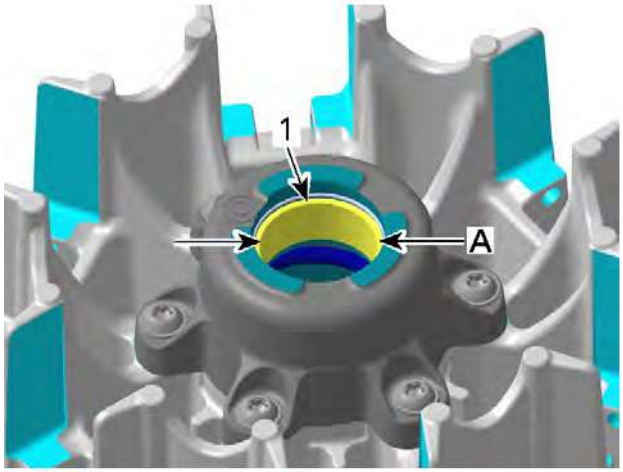
5. Measure bushing diameters of sliding sheave.

Measuring Point
At least 5 mm (1/4 in) from bushing edge



1. Bushing on fixed sheave side
A. Bore diameter of bushing

Sliding Sheave Large Bushing	
New	46.950 to 47.130 mm (1.848 to 1.856 in)
Service limit	47.160 mm (1.857 in)



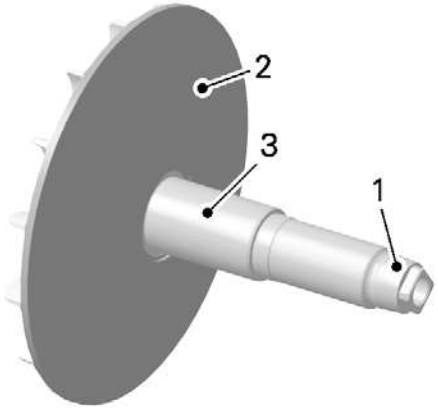
1. Bushing on governor cup side
A. Bore diameter of bushing

Sliding Sheave Small Bushing	
New	32.010 to 32.135 mm (1.26 to 1.265 in)
Service limit	32.200 mm (1.268 in)

6. Replace sliding sheave if one of the bushings is out of specification.
7. Visually inspect coatings.

Fixed Sheave

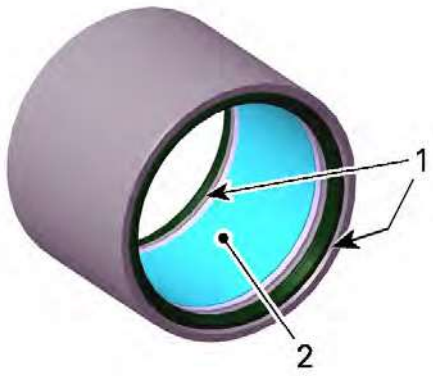
1. Check:
   - Fixed sheave contact surface to the governor cup for scratches or other damages
   - Fixed sheave plate for marks or scratches.
2. Replace fixed sheave if required.
3. Check fixed sheave contact surface with the hub for discoloration, polished area or pitting. If so, the hub needs to be replaced.



1. Contact surface to governor cup
2. Sheave plate
3. Contact surface with hub.

Hub Bearing

1. Check for:
   - Brittle, hard or damaged seals
   - Discoloration on the edges of the bearing
   - Corrosion on the needles and/or the outer ring
   - Flat spots on the needles.
2. If any of these damages appear, replace the hub bearing.



1. Oil seals
2. Needle bearing

Assembling the Drive Pulley

The assembly is the reverse of the disassembly procedure. However, pay attention to following:

Hub Bearing

1. Thoroughly clean the bearing. Remove all the grease with a pulley cleaner or a brake cleaner.

Clutch and pulley flange cleaner PRO S1

2. Dry the inside of the bearing with compressed air.

NOTE: New hub bearing comes with appropriate grease and quantity of grease.

3. Apply 1 g (.035 oz) of grease in the middle of needles.

Isoflex Grease Topas NB 5051

NOTICE
Do not use any other type of grease.

NOTE: All the content of the pouch is required.

NOTICE
Keep seals free of grease.

4. Spin the needles until grease is spread evenly.
5. Put the bearing back on the shaft.
6. Spray cleaner on a clean rag to wipe grease excess on the shaft and the pulley sheaves.
7. When CVT is reassemble repeat step 1 to 7 from *Checking the Hub Bearing Operation*.
   1. If the driven pulley is turning, **replace** the hub bearing.
   2. If the driven pulley is not turning, the hub bearing is ok.

Checking the Hub Bearing Operation

1. Bring engine to operating temperature.
2. Switch to 2WD.
3. Shift lever to “H”.
4. Stop engine.
5. Remove CVT Cover. Refer to appropriate shop manual.
6. Lift and support rear end of the vehicle so the wheels clear the ground.
7. Start engine and let run at idle speed.
8. Look at the driven pulley if it is turning or not.
   1. If turning, inspect drive pulley hub bearing, refer to *Inspecting the Drive Pulley*.
   2. If not turning, the hub bearing is ok.

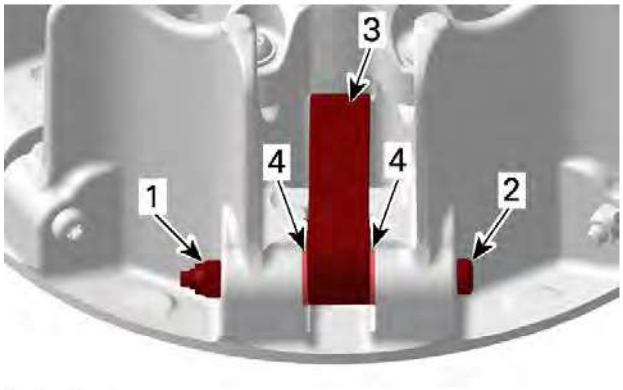
Centrifugal Lever

1. Install centrifugal levers with their thrust washers.
2. Install **NEW** lock nuts and tighten them to specification.

Tightening Torque	
Centrifugal lever lock nuts	3.5 ± 0.4 N·m (31 ± 4 lbf·in)

NOTICE

Centrifugal levers must move easily after installation.



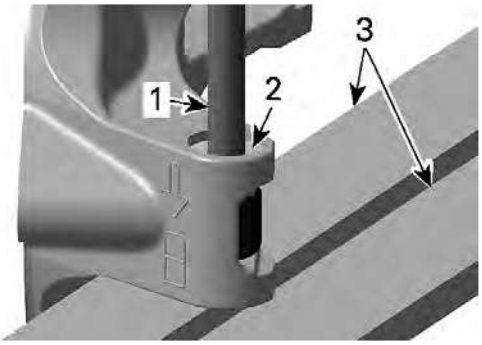
1. *Lock nut*
2. *Centrifugal lever pivot bolt*
3. *Centrifugal lever*
4. *Thrust washers*

Governor Cup

1. Rebuild governor cup with new bearing sleeves, rollers and slider shoes.

NOTICE

Final position has to be aligned with the contact surface of the slider shoes (no protrusion).

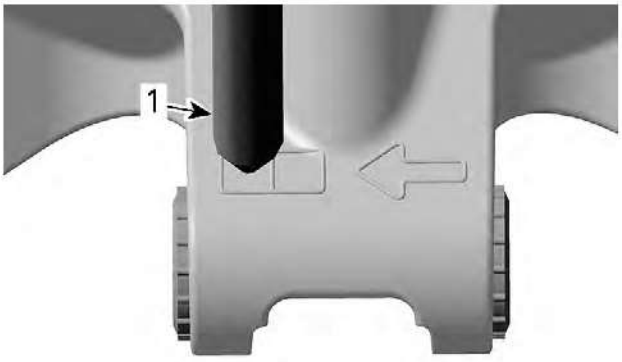


1. *Punch*
2. *Mating surface of slider shoes*
3. *Vice*

2. Each time when replacing the bearing sleeves sign the foreseen box with a punch.

NOTICE

Do not tap too hard. Violent damage of the governor cup may appear.



1. Punch

NOTICE

Rollers must move easily after installation.

3. Insert slider shoes into governor cup to properly slide in guides.

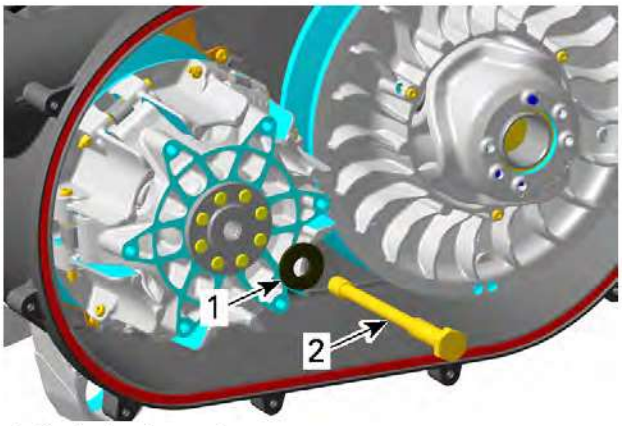
Installing the Drive Pulley

The installation is the reverse of the removal procedure. However, pay attention to the following:

NOTICE

Do not apply anti-seize or any lubricant on crankshaft and drive pulley tapers.

1. Clean mounting surfaces as described in *Cleaning* .
2. Install drive pulley on crankshaft extension.
3. Install conical spring washer with its concave side towards drive pulley then install drive pulley screw.

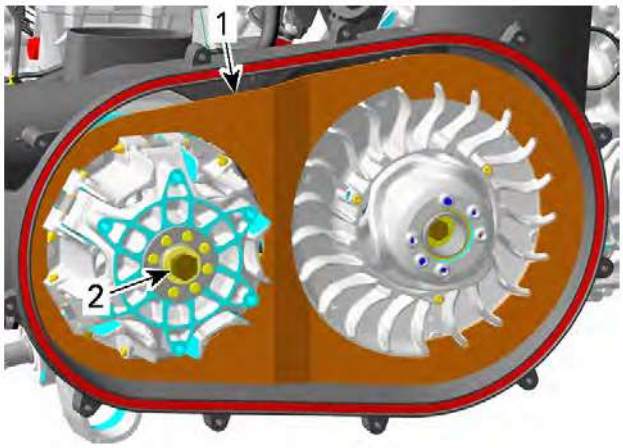


1. Conical spring washer
2. Drive pulley screw

NOTICE

Never substitute conical spring washer and/or screw with jobber ones. Always use BRP genuine parts for this particular case.

4. Lock the drive pulley as per removal procedure.



1. Clutch holder
2. Drive pulley screw

5. Tighten drive pulley screw to specified torque.

NOTICE

Never use any type of impact wrench for drive pulley installation.

Tightening Torque	
Drive pulley screw	120 ± 8 N·m (89 ± 6 lbf·ft)

Driven Pulley

Removing the Driven Pulley

1. Remove the CVT drive belt.
2. Install the clutch holder.

Clutch holder (P/N 529036432)	

3. Remove the driven pulley screw and its collar washer.
4. Discard the screw.