INSTALLATION AND TUNING GUIDE

CAN AM AO BASE CLUTCH KIT

***PART NUMBER(s)**: AO BASE*

**WE ARE NOT RESPONSIBLE FOR ANY DAMAGES.
BE VERY CAREFUL TO NOT DAMAGE YOUR CLUTCH
DURING THIS PROCESS.**

TOOLS NEEDED

- T30 TORX
- KWI Splitter plate
- Primary clutch puller
- 19mm 1/2" drive impact socket
- 5/16 or 8mm Socket
- 17mm socket
- Torque Wrench
- Clutch Belt removal tool
- Blue Locktite

ESTIMATED INSTALL TIME

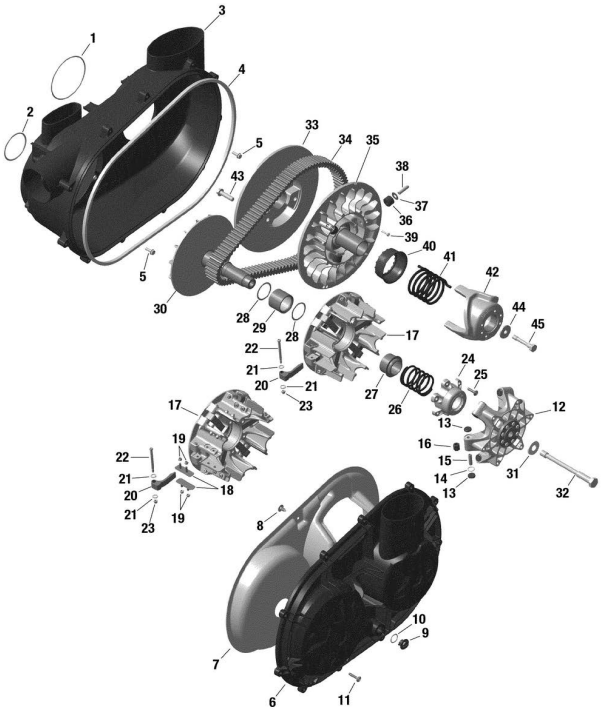
75 MINUTES

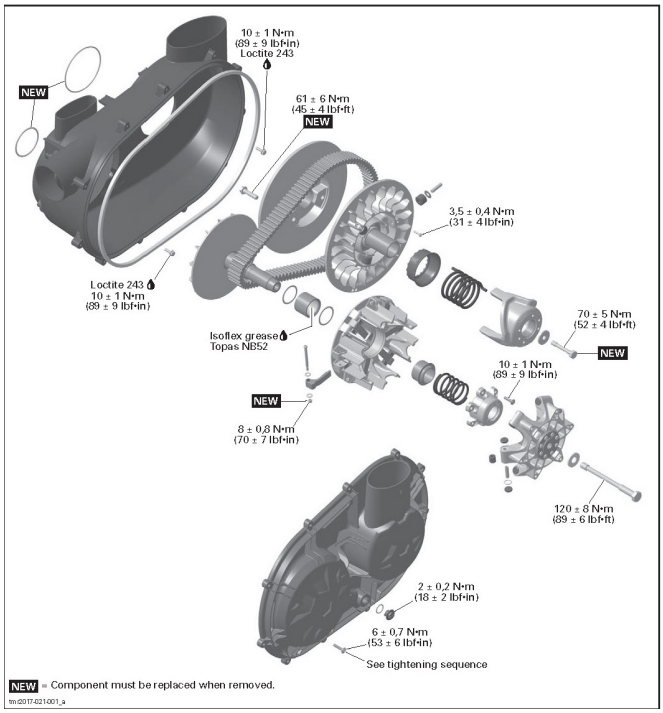
NOTE: No component marking is required before disassembly.

Primary clutch disassembly and reassembly

Reference diagrams on page 2

1) Remove belt box cover. (T30 TORX)
2) Remove CVT belt. (Clutch Belt Removal Tool)
3) Remove governor cup #12 and primary clutch outer half #17. (KWI splitter plate and primary clutch puller) **You do not need to remove the clutch from the vehicle or crankshaft to disassemble the clutch and replace the spring but you can if you would like to do the clutch kit install on the bench) ***
4) Disassemble Outer half and Governor cup assy
   a) Slide governor cup #12 out of Outer half #17 (3 slider shoes and 3 orings may fall out as you do this, that is normal. The rest should be pressed in) ITS RECOMMENDED TO REPLACE THE 3 SLIDER SHOES AND ORINGS EVERY 500 MILES- KWI HAS A 500 MILE SERVICE KIT THAT INCLUDES EVERYTHING YOU NEED)
   b) Inspect governor cup pockets for wear (REFERENCE QRS PRIMARY CLUTCH MANUAL ON OUR WEBSITE FOR LIMITS) and scrape out old smashed oring if there is one. If the pockets are worn beyond limits you will need to replace the governor cup assembly to prevent future issues. (A new governor cup from BRP does not come with hex rollers, roller axles or slider shoes. KWI sells a complete governor cup assembly ready to go if you need)
5) Replace Primary clutch spring (reference diagrams on page 2)
   a) Slide outer half assembly over KWI threaded rod and secure with nut and washer to hold spring pressure as you remove 6 bearing cover attach screws #25.
   b) Relax spring pressure by loosening nut on KWI threaded rod and remove bearing cover #24
   c) Replace spring with KWI blue/orange spring and install bearing cover #24 using KWI threaded rod to compress spring pressure.
   d) Reinstall 6 bearing cover attach screws #25 and torque per chart on page 2.
6) Install the KWI AO.001 weights and magnets as outlined in the chart below.
   a) Remove 6 weight pins #22, 6 weight pin nuts #23, 6 weights #20 and 12 washers #21.
   b) Install KWI AO.001 weights by installing washers #21 and securing with 6 weight pins #22, 6 weight pin nuts #23. Torque per chart on page 2.
   c) Install magnets in AO.001 weights as required per chart on page 3.
7) Reinstall Governor cup and outer half.
   a) Clean inside of governor cup steel taper and end of clutch fixed shaft with brake clean to remove all grease and dust.
   b) Install remaining 3 slider orings #14 and 3 slider shoes #13 in governor cup, Slide governor cup into outer half.
   c) Make sure Bearing #29 and 2 thrust washers #28 are on the primary fixed shaft then install outer halw with governor cup.
8) Install primary bolt and washer and torque to manufacturer specs.





THE FOLLOWING IS ONLY REQUIRED IF YOU NEED TO INSTALL A GROOVIX OR CHANGE THE SECONDARY SPRING

Removing and installing secondary clutch

1) Remove belt box cover. (T30 Torx)
2) Remove CVT belt. (Clutch Belt removal tool)
3) Remove secondary clutch bolt. (17mm or 7/8" - 1/2" Drive Socket)
4) Secondary clutch will slide off shaft.
5) (KWI Float Mod) Reinstall secondary clutch in accordance with the KWI Fload Mod Instructions.
6) (No KWI Float Mod) Align splines and slide secondary clutch on shaft.
7) Secure secondary clutch on crankshaft by torquing the secondary clutch bolt to bolt manufacturer specs.(17mm -1/2" Drive Socket)(Torque Wrench) Use a long 1/4" or 3/8" extension thru the helix and spring to hold secondary while torquing.
8) Reinstall CVT belt and belt box cover.

Secondary clutch disassembly and reassembly

1) Remove secondary clutch. (See "Removing and installing secondary clutch")
2) Clamp welded nut end of threaded rod in a suitable vise. Place puller cup (without puller cup bolt) over
3) threaded rod.
4) Place secondary clutch over threaded rod with helix facing down Turn nut in to compress helix slightly and take tension off of helix bolts. Remove 3 helix bolts.
5) While holding sheaves from turning (by hand) and helix from turning (with a long 1/4 or 3/8 extension inserted thru helix and spring) turn nut out to relax spring tension. Disassemble clutch as required. (22mm or 7/8" - Wrench)
6) Install the secondary movable and fixed sheaves together on the threaded rod with the helix
7) Install the OEM helix or KWI GROOVIX with the spring clocked as specified in the Tuning Chart on Page 3. The GROOVIX Hole #1 is marked by a dot then count up in a clockwise direction per the photo. The GROOVIX helix uses equally spaced holes and does not correlate to the OEM holes.
8) Install the large compression washer then nut on the threaded rod until it starts to compress the spring.
9) Using a KWI Helix twist tool or a long 1/4 or 3/8 extension inserted thru helix and spring. Hold the sheaves from turning while you rotate the helix CLOCKWISE until the legs clear the rollers. Tighten the threaded rod nut and compress the helix spring.
10) Install the 3 helix bolts using BLUE Locktite and torque to spec.

MAGNET RPM ADJUSTMENT

This requires the cam arms be removed from the clutch. The weight of the added magnets affects RPM. The more magnets that are installed the lower the RPMS will be. 2 magnets will change full throttle RPM approx 75 RPM

1) Remove the cam arms from the clutch. (SEE "Primary clutch disassembly and reassembly" ABOVE)
2) Reinstall the cam arms and tighten to spec.

AO BASE TNING CHART

The chart below is a guideline with very close start points with 30-33" tires riding at Sea Level elevation. (choose the Crankshaft horsepower/Wheel horsepower that best matches your X3) (Identical cars may have HP differences of up to 10 HP due to engine manufacturing tolerances so clutch kit calibration adjustments are necessary in most cases)

For High Altitudes- subtract 15% from the Published HP range of your tune to get actual effective HP. **Example - 200 CHP (at sea level) x .85 = 170CHP (use the 175CHP line in the chart below as your baseline setting)**

For sand dunes or large tires (35"+)- subtract 8% from the Published HP range of your tune to get actual effective HP. **Example - 200 CHP x .92 = 184CHP (use the 175CHP line in the chart below as your baseline setting)**

For tires 28" and smaller- Add 8% from the Published HP range of your tune to get actual effective HP. **Example - 200 CHP x .1.08 = 216CHP (use the 215CHP line in the chart below as your baseline setting)**

For Launch Control with KWI Yellow high engagement spring - Install the KWI Yellow high engagement Launch Control spring (Sold Separately) this will raise engagement RPMS for your Launch Control/2 Sep. Add 4 magnets to the suggested settings in the chart below compensate shift RPM for additional spring pressure.

AO.001 cam arms have 2 magnet holes - *you can place magnets in either hole* but magnets MUST be distributed so that the clutch is balanced. Make sure arms with identical magnets are either placed across from each other or in every other position to maintain clutch balance. Do not overfill magnet slots **(FLUSH IS FULL)**!

Crankshaft horsepower (CHP) /Wheel horsepower (WHP)	Total # of Magnets to be installed in the 2 cam arm holes inside the clutch. (not per weight)	Primary spring	Secondary spring / Helix / hole	Belt Recommendation	Full throttle RPM at 55mph
120CHP/100WHP	Empty, no	Blue-Orange (1950 engagement) - KWI Yellow (2900 engagement) **(see notes above for additional magnets required)**	**OEM TURBO RR HELIX-** OEM TURBO RR Black/Green secondary spring in hole #3 (60 degrees wrap) **KWI DR3 GROOVIX -** OEM TURBO RR Black/Green secondary spring in hole #3 (60 degrees wrap)	OEM 652 Gates 48R4289 Gboost/Super Atv WBB652RS or WBB383	7850 RPM +/- 100 RPM (ALL OEM TURBOS)
152CHP/130WHP	6				
175CHP/165WHP	14				
2021 TURBO RR STOCK MUST USE THIS CALIBRATION!!	4				
195CHP/175WHP	16		**OEM TURBO RR HELIX-** OEM TURBO RR Black/Green secondary spring in hole #4 (30 degrees wrap) **FOR KWI DR3 GROOVIX-** OEM TURBO RR Black/Green secondary spring in hole #2 (35 degrees wrap)		
215CHP/185WHP	18				
265CHP/230WHP	24		**KWI DR3 OR #4 GROOVIX-** KWI DARK BLUE/PINK SPRING IN HOLE #2 (35 degrees wrap)		

TROUBLESHOOTING

BEFORE YOU MAKE ANY CLUTCHING ADJUSTMENTS OR CONTACT KWI FOR SUPPORT VERIFY THE FOLLOWING!!!

*** Clutching only reacts to the availabe HP or drivetrain loads, most often low power is the cause of poor clutching performance and the issue is not the clutching itself. The AO calibrations have been verified to produce correct RPM on thousands of vehicles so if you install per your published HP on the chart and the RPM is not correct **you must suspect poor engine performance as the issue first.**

*** **#1 CAUSE OF LOW RPM** IS POOR ENGINE PERFORMANCE - **troubleshoot for power loss, incorrect wastegate actuator crack pressure, boost leaks, poor fuel or that your not using the "normal key"** which limits power to 60% before making additional clutching adjustments. This is the first thing we will ask you when you call us so make sure youve verified these are correct. (Refer to the KWI videos under the support section on our website or YouTube for additional help)

AO BASE PARTS INCLUDED

	PART DESCRIPTION	QTY	OEM PART #	OUR PART #
	AO.001 ADJUSTABLE CAM ARM	6	—	
	BLUE / ORANGE PRIMARY SPRING	1	—	BLU/ORG
	MAGNET PACK	1	—	MAGNETS