# CONVERTING AN OEM WELDED CROWNWHEEL & DIFFERENTIAL UNIT
# FOR ASSEMBLY ONTO A QUAIFE QDF18N ATB DIFFERENTIAL

STEP 1 - SHEET 2 - MACHINE A REGISTER ON THE CROWNWHEEL TEETH.
STEP 2 - SHEET 3 - MACHINE OFF THE WELD HOLDING THE DIFFERENTIAL AND CROWNWHEEL TOGETHER.
STEP 3 - SHEET 4 - MACHINE THE CROWNWHEEL TO THE CORRECT DEPTH FOR ASSEMBLY.
STEP 4 - SHEET 5 - DRILL AND TAP THE CROWNWHEEL.
STEP 5 - SHEET 6 - ASSEMBLE ONTO THE QUAIFE ATB DIFFERENTIAL.
STEP 6 - REFIT DIFFERENTIAL INTO DIFFERENTIAL HOUSING FOLLOWING MANUFACTURING INSTRUCTION.

THIS DRAWING IS PROVIDED AS A GUIDE AND R.T. QUAIFE ENGINEERING TAKE NO RESPONSIBILTY FOR ANY CONSEQUENCES INCURRED AS A RESULT OF THIS INSTRUCTION.
THIS CONVERSION SHOULD ONLY BE UNDERTAKEN BY EXPERIENCED MACHINISTS WITH A COMPREHENSIVE ARRAY OF WELL MAINTAINED TOOLING.

**QUAIFE®**
*DESIGN AND DEVELOPMENT*

| UNLESS OTHERWISE STATED: | TOLERANCES | |
|---|---|---|
| **ALL DIMENSIONS IN MILLIMETERS** | DIMENSIONS: | 0 PLACES: ±0.25 |
| | | 1 PLACE: ±0.2 |
| | | 2 PLACES: ±0.1 |
| GENERAL SURFACE FINISH: $\frac{1.6}{\nabla}$ | ANGLES: | ±0.25° |
| SHEET 1 OF 6 | SCALE 1:2 U.O.S. | |

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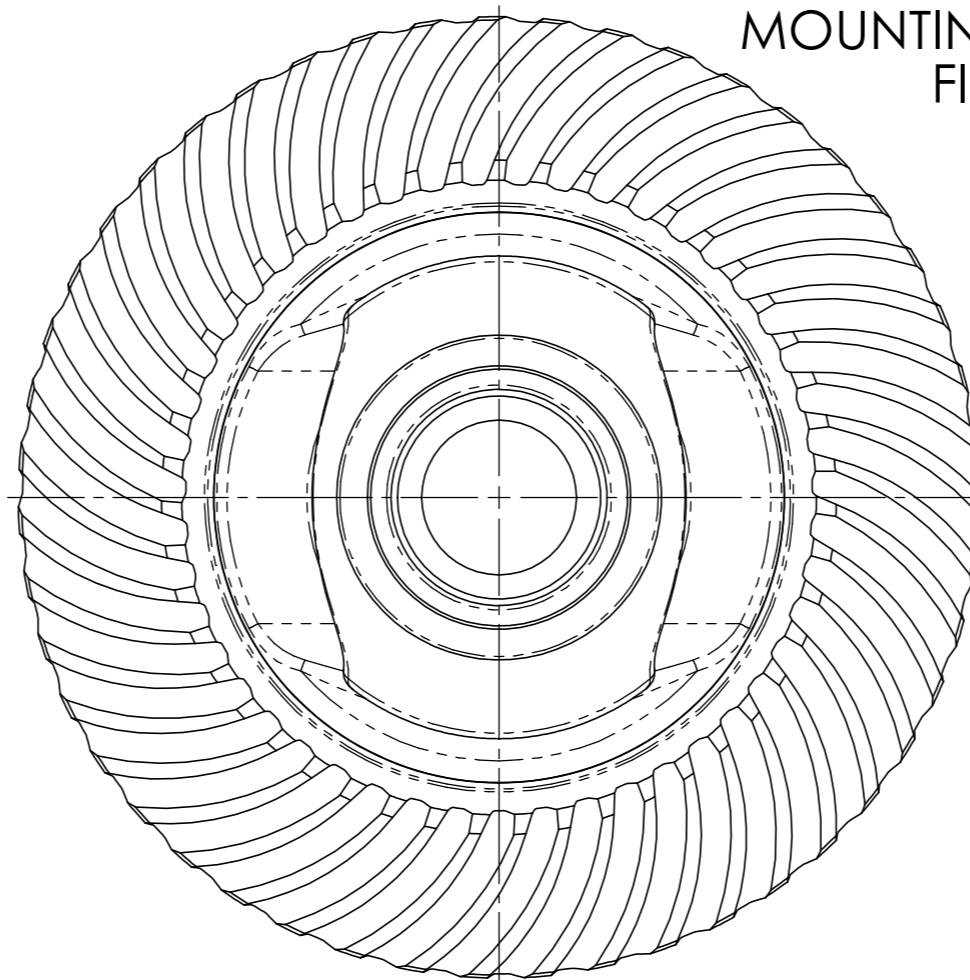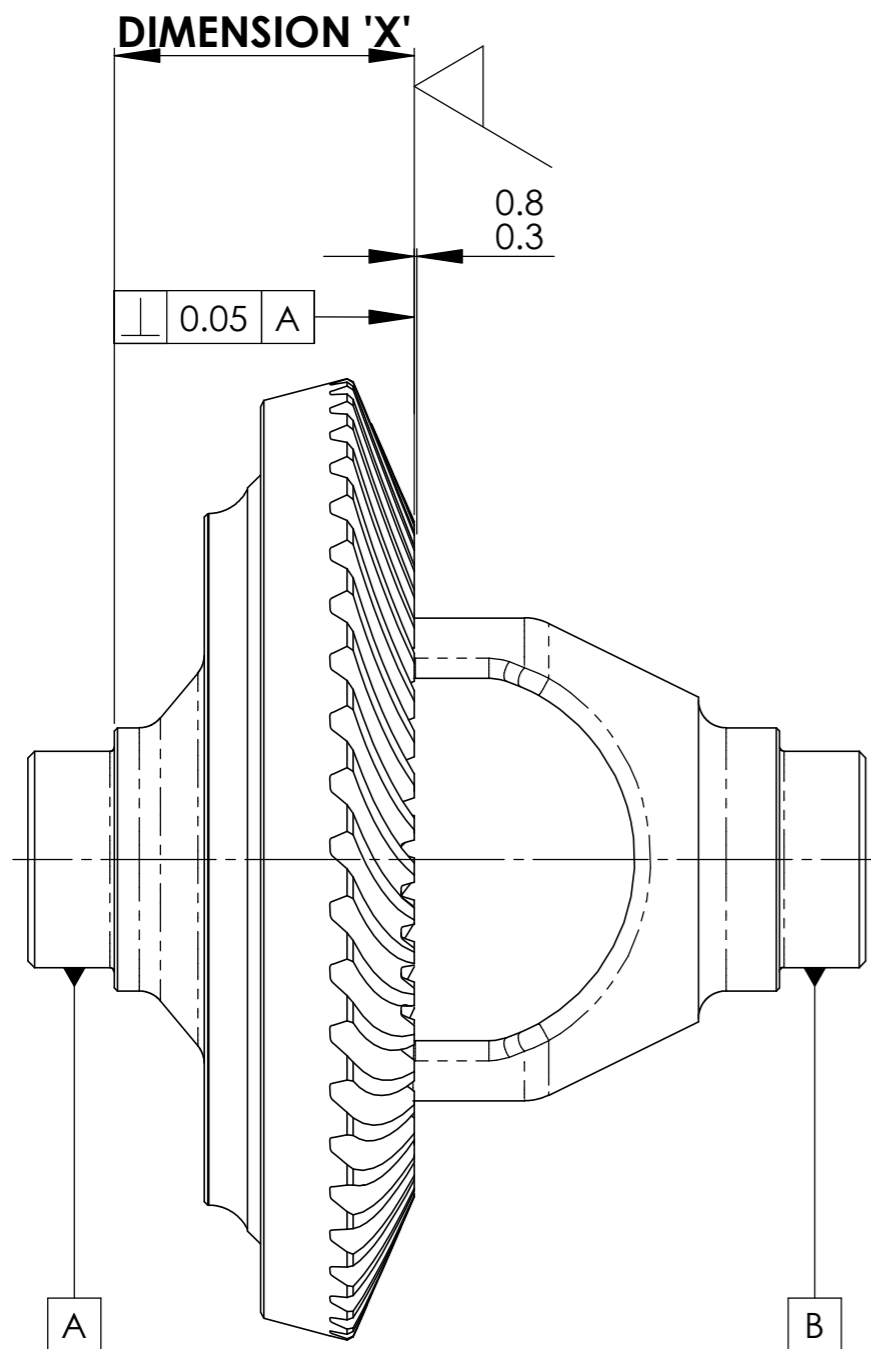DIFF ASSEMBLY

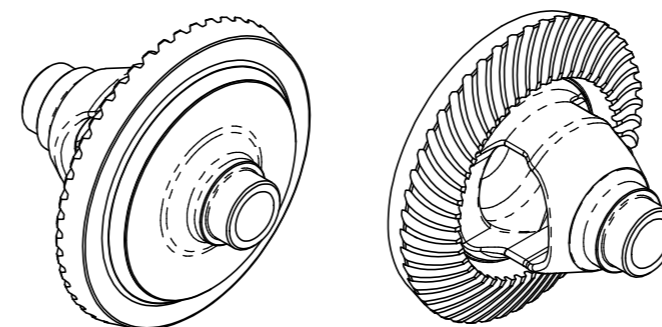PART No.: F-18N1-MOD01

USED IN: BMW DIFF

REMOVE FOR ORIGINAL

# STEP 1

## MACHINE A REGISTER ON THE HIGHEST PEAK OF THE CROWNWHEEL GEAR TEETH.
## *IMPORTANT* TAKE NOTE OF DIMENSION 'X'

THIS IS TO ENABLE THE FINAL POSITION OF THE CROWNWHEEL TO BE CHECKED ONCE IT HAS BEEN MOUNTED ONTO THE QUAIFE ATB DIFFERENTIAL, AND TO ALLOW FOR MOUNTING FLAT ON A MACHINE BED FOR FINISHING OR ADJUSTMENT OF THE CROWNWHEEL MOUNTING FACE

DIMENSION 'X'

0.8
0.3

⊥ | 0.05 | A

A

B

**WHEN MOUNTING THE DIFFERENTIAL INTO THE LATHE USE THE BEARING JOURNAL DIAMETERS (MARKED A&B) WITHIN THE CHUCK, DO NOT USE THE INTERNAL BORE.**

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|---|---|
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| GENERAL SURFACE FINISH: 1.6 ∇ | ANGLES: ±0.25° |
| SHEET 2 OF 6 | SCALE 1:1.75 U.O.S. |

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PART No.: F-18N1-MOD01

USED IN: BMW DIFF

SOLIDWORKS

A3(M) SHEET

REMOVE FOR ORIGINAL

# STEP 2

# HARD TURN THE WELD TO FREE CROWNWHEEL FROM THE STANDARD DIFFERENTIAL.
## SLOW CUTTING SPEED TO BE USED, AND A HARD TURNING INSERT LIKE KORLOY 4NU/CNGA 120408.
## FEED CAN BE OPERATED MANUALLY

## ONCE REMOVED, CHECK THE INTERNAL DIAMETER OF THE CROWNWHEEL, THIS SHOULD BE AN INTERFERENCE FIT WITH THE QUAIFE QDF18N ATB DIFFERENTIAL. THE CROWNWHEEL SPIGOT DIAMETER OF THE QDF18N IS 132.032mm (5.1981")

## THIS MUST NOT BE GREATER THAN 30.00mm



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| SHEET 3 OF 6 | SCALE 1:1.75 U.O.S. |

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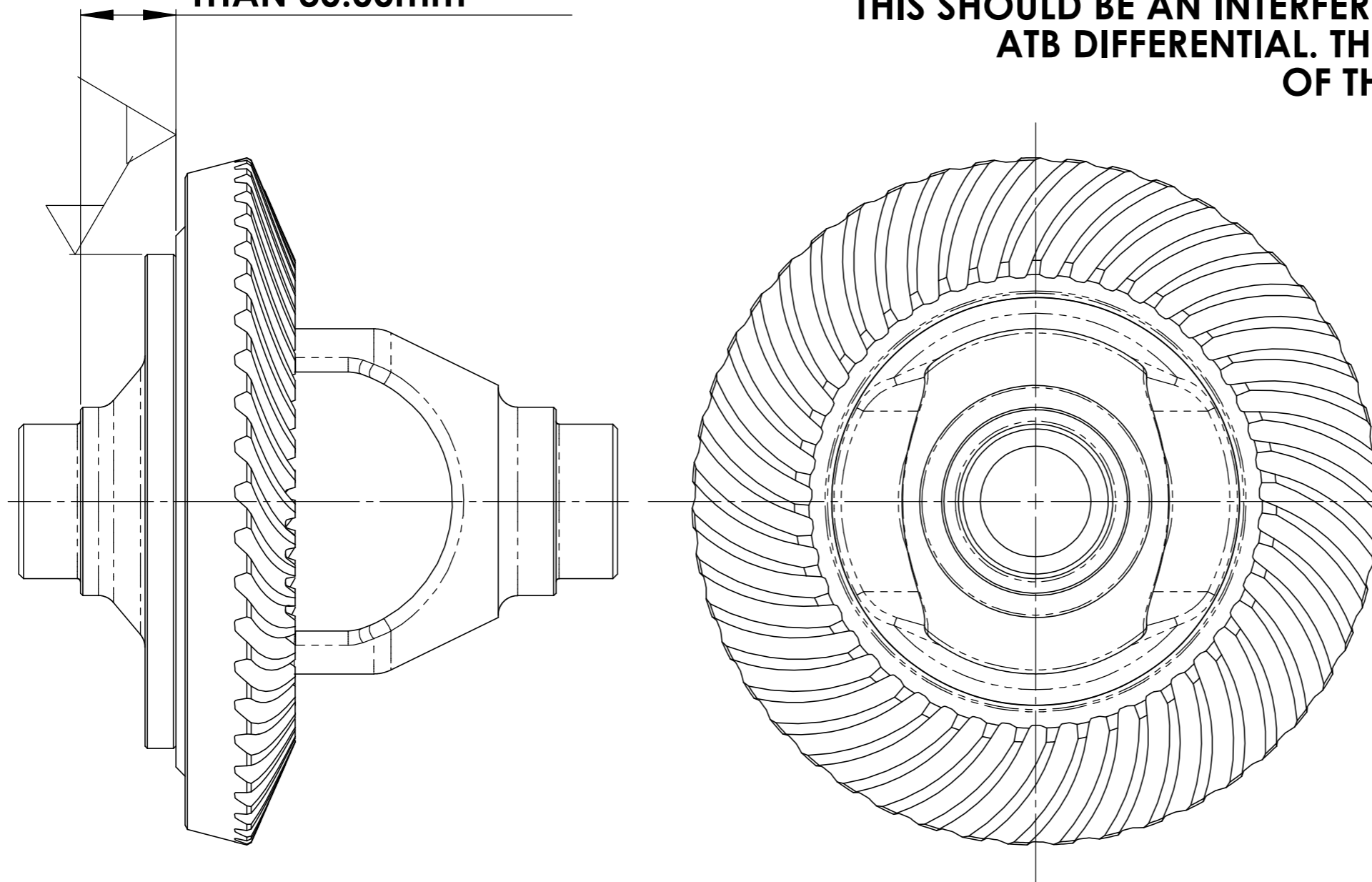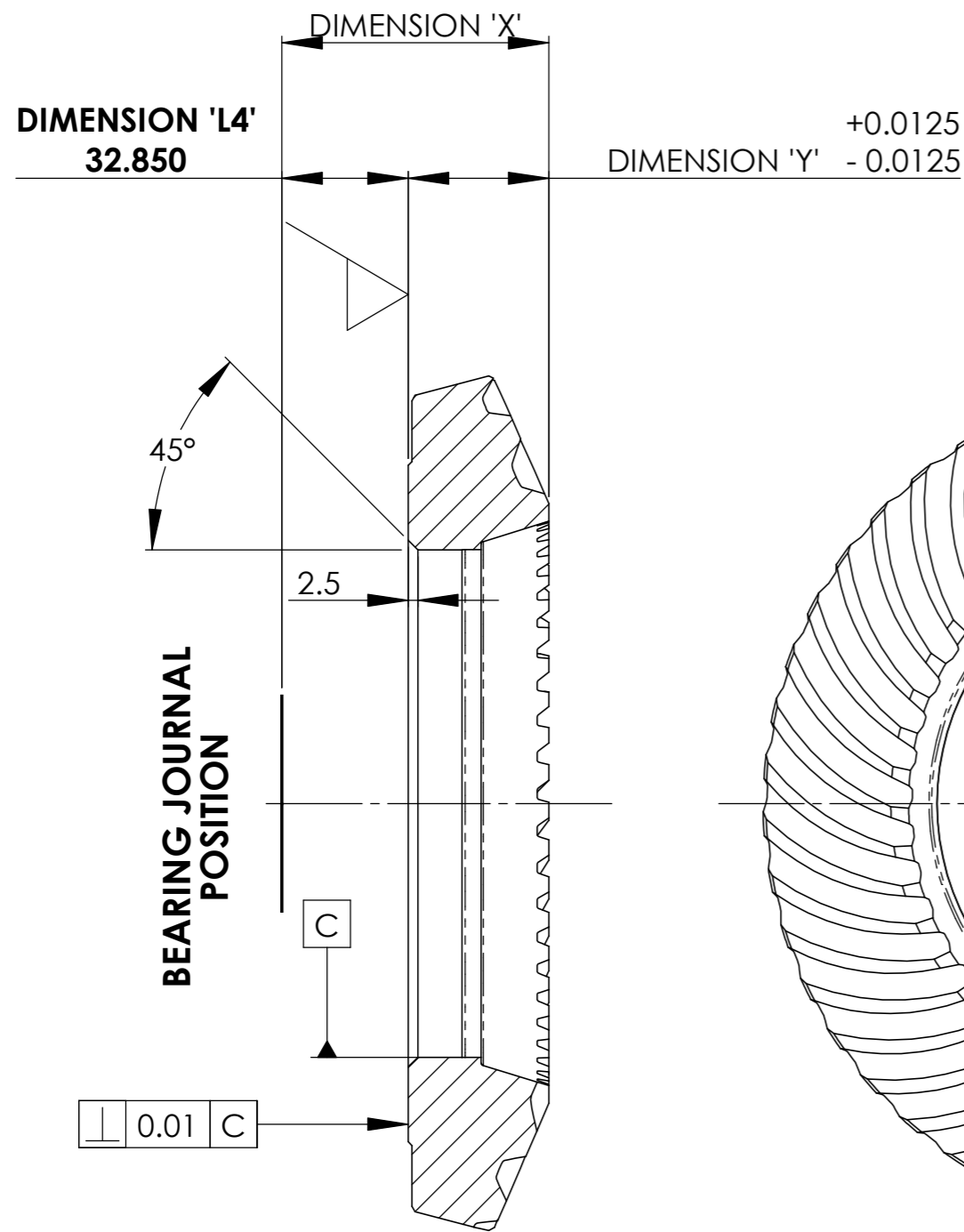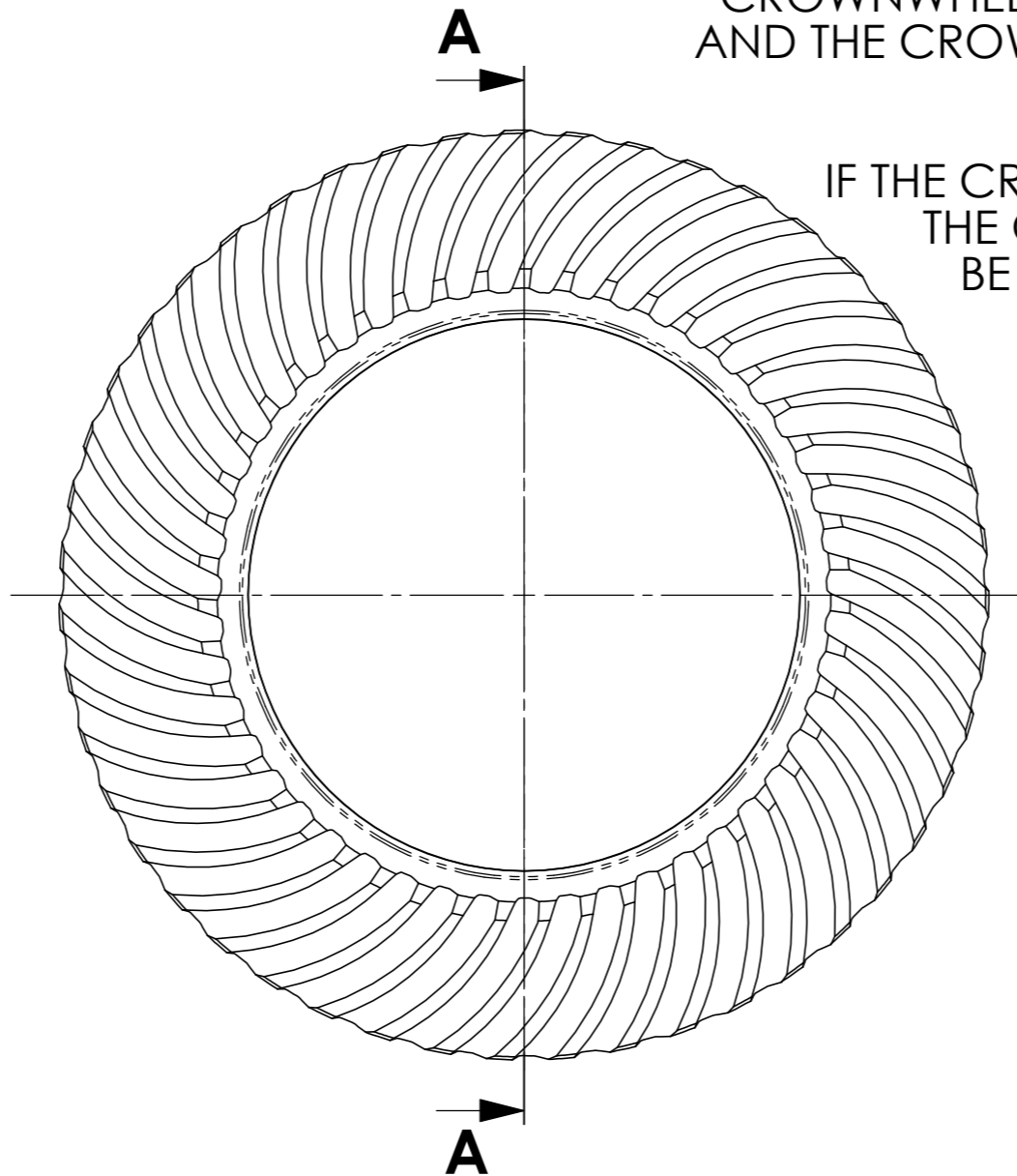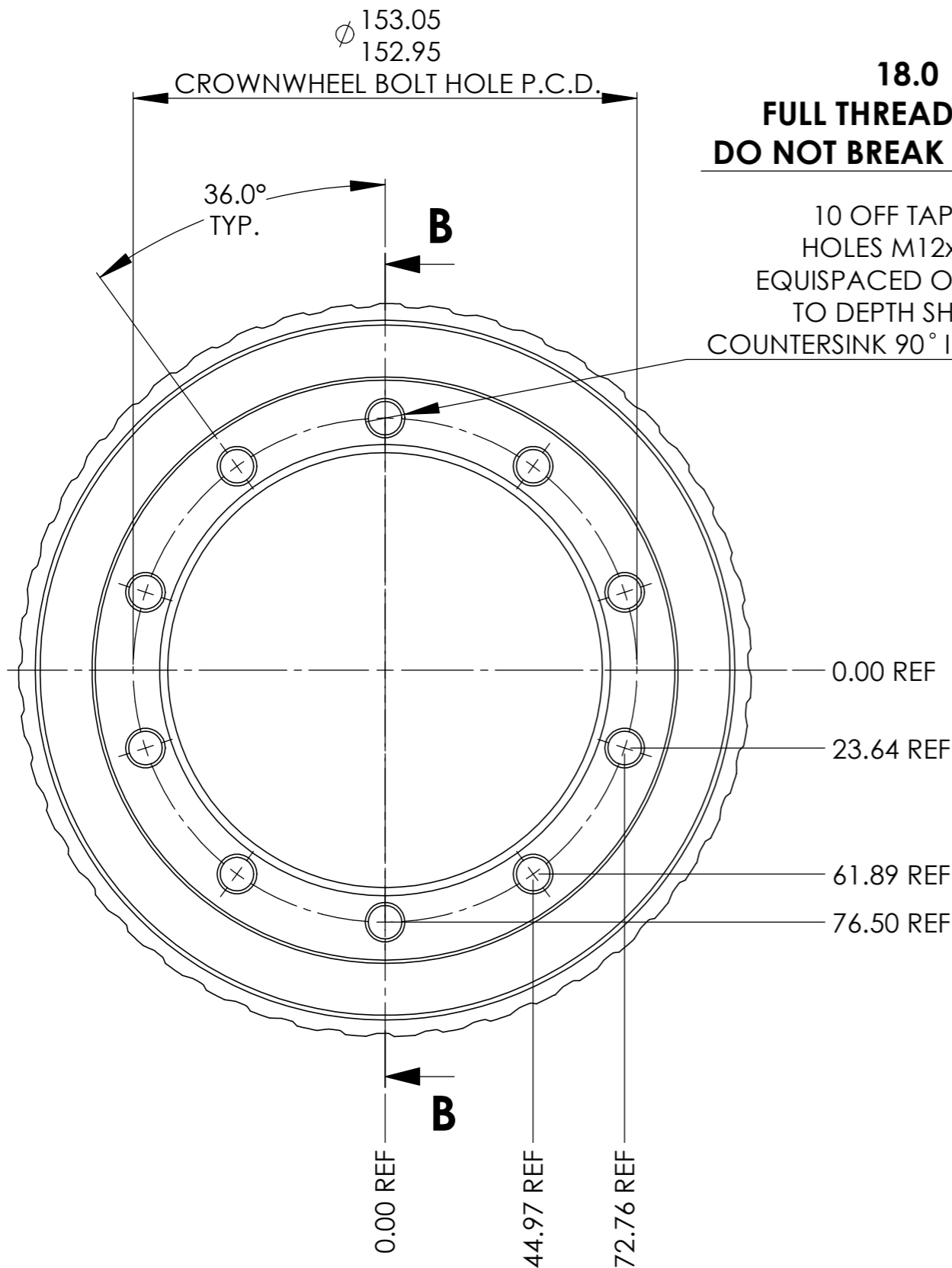DIFF ASSEMBLY

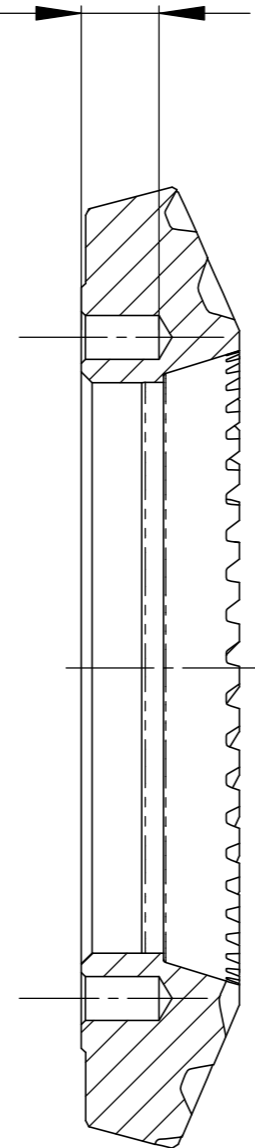PART No.: F-18N1-MOD01

USED IN: BMW DIFF

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## STEP 3

# MACHINE BACK OF CROWNWHEEL AND CHAMFER INTERNAL BORE AS SHOWN
## DIMENSION 'Y' = DIMENSION 'X' - 32.850

### NOTE:- DIMENSION 'Y' IS CRITICAL
IF THE CROWNWHEEL IS MACHINED TOO THICK THEN THE CROWNWHEEL TO PINION BACKLASH WILL BE REDUCED AND THE CROWNWHEEL WILL HAVE TO BE RE-MACHINED TO RESTORE THE CORRECT BACKLASH.

IF THE CROWNWHEEL IS MACHINED TOO THIN THEN THE CROWNWHEEL TO PINION BACKLASH WILL BE TOO LARGE AND THE CROWNWHEEL WILL HAVE TO BE SHIMMED TO RESTORE THE CORRECT BACKLASH.

**DIMENSION 'X'**

**DIMENSION 'L4'**
**32.850**

DIMENSION 'Y' $^{+0.0125}_{-0.0125}$

45°

2.5

**BEARING JOURNAL POSITION**

C

⊥ | 0.01 | C

**A**

**A**

**SECTION A-A**

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| | 2 PLACES: ±0.1 | |
| GENERAL SURFACE FINISH: $^{1.6}\nabla$ | ANGLES: ±0.25° | |
| SHEET 4 OF 6 | SCALE 1:1.75 U.O.S. | |

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SOLIDWORKS

A3(M) SHEET

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# STEP 4

## DRILL AND TAP 10 OFF CROWNWHEEL BOLT HOLES
## TO DEPTH AND IN POSITIONS SHOWN
## IMPORTANT - DO NOT BREAK THROUGH

$\phi$ 153.05
152.95
CROWNWHEEL BOLT HOLE P.C.D.

36.0°
TYP.

B

**18.0**
**FULL THREAD DEPTH**
**DO NOT BREAK THROUGH**

10 OFF TAPPED
HOLES M12x1.75
EQUISPACED ON P.C.D.
TO DEPTH SHOWN
COUNTERSINK 90° INC. TO $\phi$12
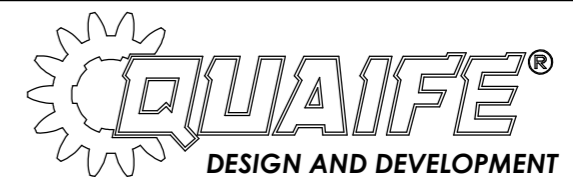
**IF THERE IS A CLEAR RISK OF BREAKING THROUGH
THEN THE END OF THE BOLTS MUST BE CHAMFERED
TO ALLOW THE CLEARANCE INTO THE END OF
A REDUCED DRILLING DEPTH.**

0.00 REF

23.64 REF

61.89 REF

76.50 REF

B

0.00 REF

44.97 REF

72.76 REF

## SECTION B-B

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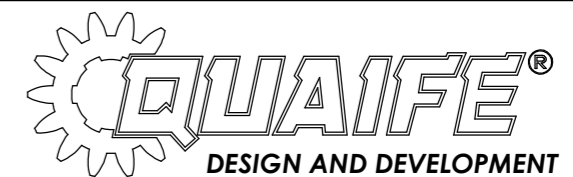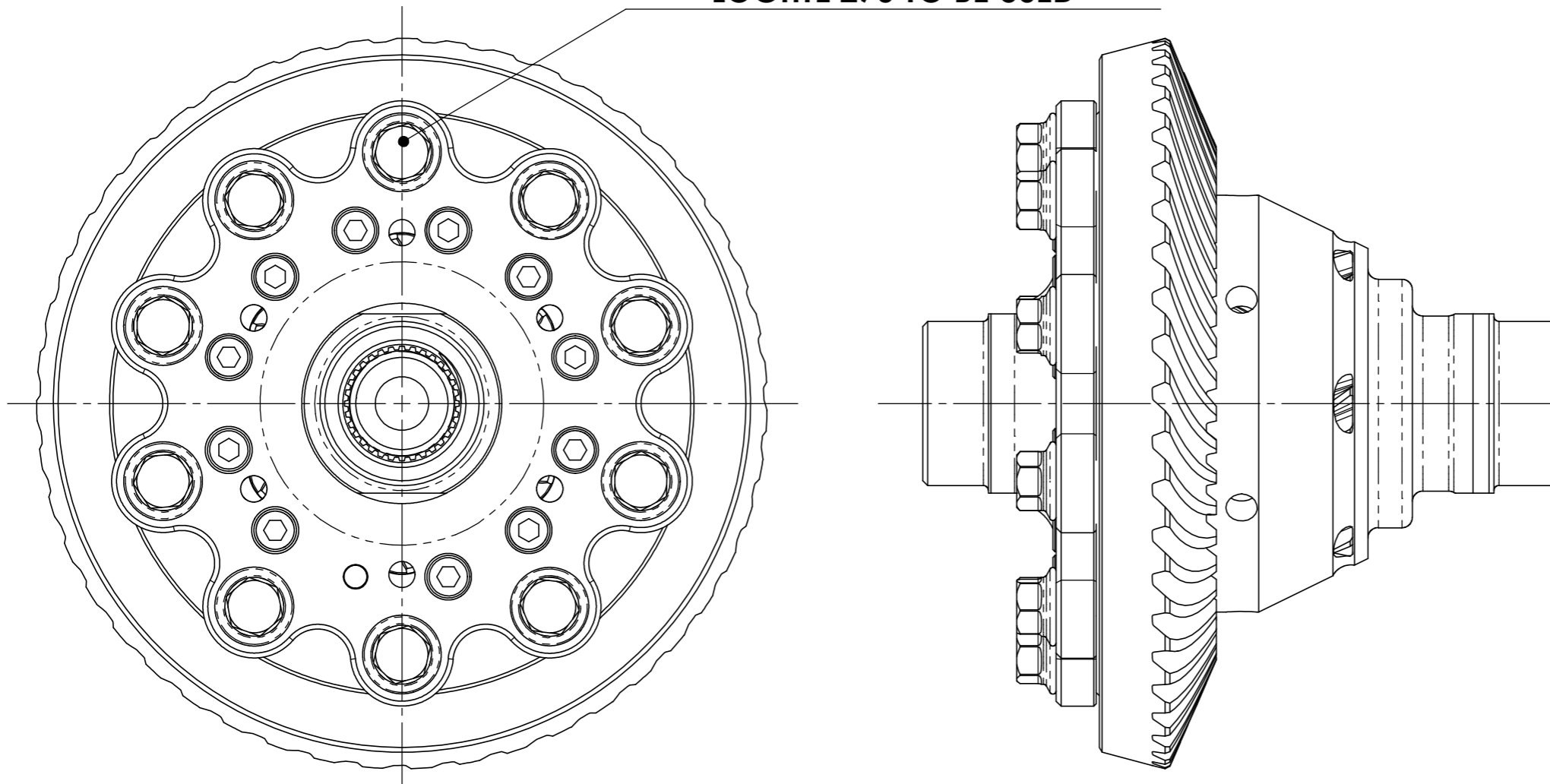
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PART No.:
F-18N1-MOD01

USED IN: BMW DIFF

REMOVE FOR ORIGINAL

# STEP 5

## ASSEMBLE THE CROWNWHEEL ONTO THE QUAIFE ATB DIFFERENTIAL.
## FIT THE 10 OFF M12x1.75 SUPPLIED BOLTS. THESE SHOULD BE TIGHTENED TO 100-110Nm

**10 OFF M12x1.75 BOLTS**
**TIGHTENING TORQUE IS 100+10Nm**
**TORQUE ANGLE IS +30°**
**LOCTITE 270 TO BE USED**



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