



DC940 Dewalt Conversion (Interface with Chiaphua)

Team 624
CRyptonite



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Acknowledgement: Nothing But Dewalts by Joseph Pavliga (Team 647) and Joseph Johnson (Team 47) – December 2004

1. Complete DC840 Dewalt drills (less battery) are ordered from Helton & Co, Inc (480-395-6015) for approximately \$50.00 (fig 1).



Figure 1

2. There is a left-screw inside the chuck that needs removal (save for later) using a T-15 driver (fig 2). These screws are difficult to remove and need to be soaked in WD-40 ahead of time.



Figure 2

3. The chuck can then be removed by tightening on an Allen wrench and a vise. These are a $\frac{1}{2}$ "-20 thread (right Hand). The drill with chuck removed is shown below (fig 3).



Figure 3

4. All of the body screws are then removed from the casing so the drill can be completely disassembled (fig 4).



Figure 4

5. All the drill parts are shown below (fig 5).



Figure 5

6. The parts in fig 6 are kept and those shown in fig 7 can be discarded or recycled.



Figure 6



Figure 7

7. The four screws on the end of the magnesium housing can be removed exposing the clutch selector. The selector needs to be discarded along with small black clips. The clips can be moved by hand from the magnesium housing and transmission housing (fig 8 & 9).



Figure 8



Figure 9

8. The four end screws can now be placed (fig 10).



Figure 10

- Cut the yellow clamshell using a bandsaw approximately 1.5" from "Face A" and across the trigger as shown in fig 11. The original clamshell is shown along with the cut-off jig (used later) for reference in fig 12. The arrow points to needed piece for the conversion.

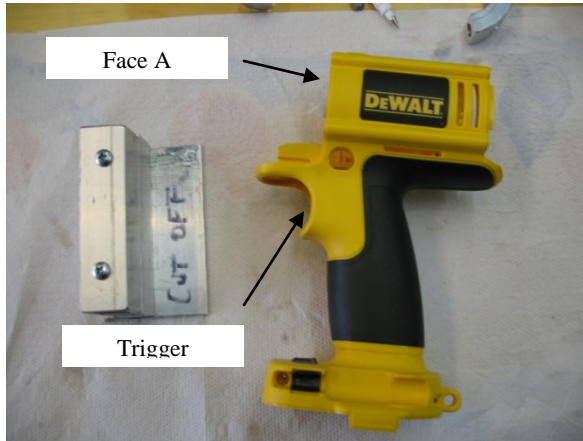


Figure 11



Figure 12

- The required piece is then sanded to the required length (1.25") using the cot-off jig. This jig was made to ensure the face is square and the correct length. The jig and sander should be checked for square before sanding the part. This process is shown in fig 13 & 14.

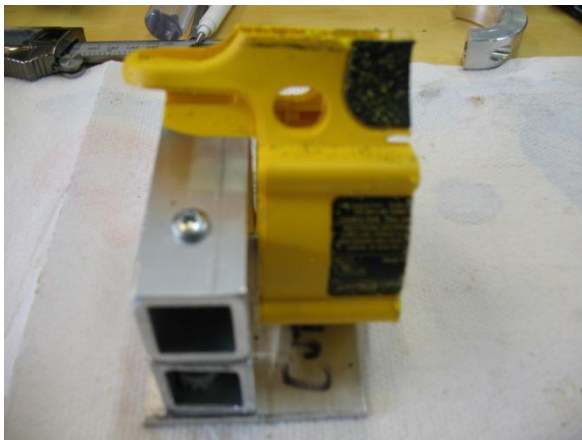


Figure 13

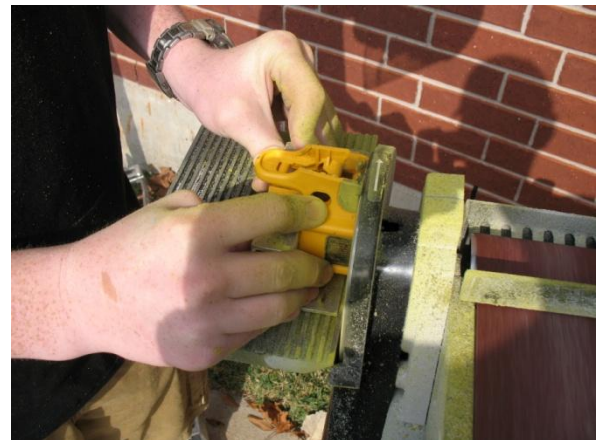


Figure 14

- The trigger area is also sanded so there is a small sliver (1/8") reaming of the top of the original trigger top. The newly sanded surface should lie on the sander base to maintain a square finish. The sanding operation is shown in fig 15 and the final product is shown in fig 16.



Figure 15

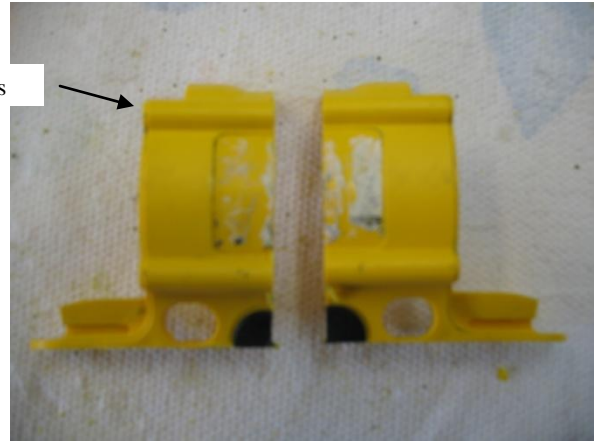


Figure 16

12. Drill out the four screw holes with a 5/32" drill. This will allow clearance holes for the 6-32 socket head cap screws. You can now paint these.
13. From the Dewalt transmission, take out the clutch rod, spring, pall, back plate, first stage ring gear, and the four first stage planet gears and set them aside (fig 17). The black back plate has to be turned slightly using a small screwdriver to remove exposing the first stage gears.

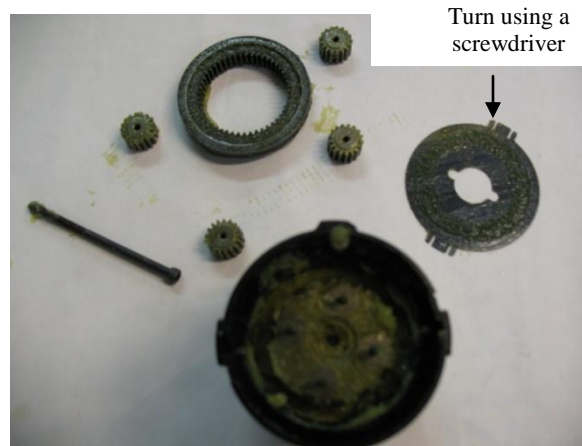


Figure 17

14. Take out the Carrier Sun gear that is located behind the four planet gears and press onto sun gear adapter (fig 18). A small pair of pliers made needed (use carefully).



Figure 18

15. Fill exposed gear section with a clean rag or towel to prevent gears from falling out. **Always support this area when handling the transmissions.**
16. Turn over the transmission and remove the black cap (fig 19). Take out the anti-backdrive pins and rod/spring located at the top of the transmission under the black plastic cap (fig 20 & 21). Replace the cap.

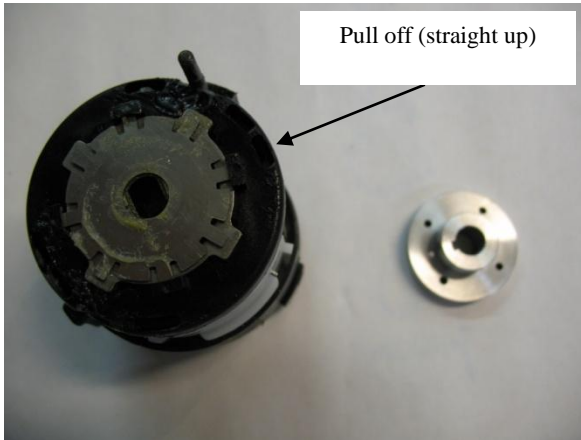


Figure 19



Figure 20



Figure 21

17. The Transmission Mount is coupled to the Chiaphua motor using two #10-32 x 0.5" socket head screws (fig 22).



Figure 22

18. The sun gear assembly is mounted to the Chiaphua motor using $\frac{1}{2}$ " long 2mm keystock and a #8-32 x $\frac{3}{8}$ " set screw (fig 23). The fig is shown w/o the mounting bracket (do not remove). The sun gear assy must be pressed fully onto the shaft. The set screw should have lock-tite to prevent back out.

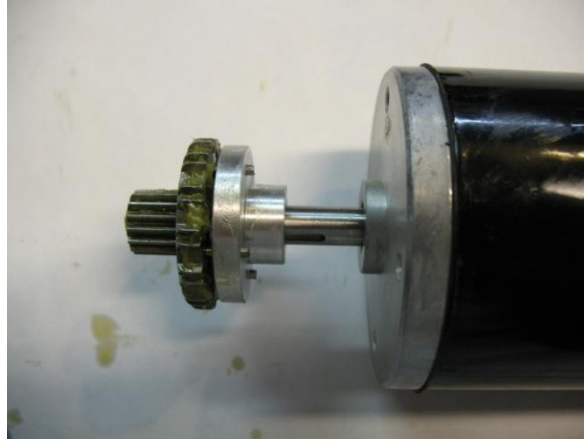


Figure 23

19. Place the clamshells over the transmission and inert sun gear/motor assy. Screw in four #6-32, 2.25" long socket screws into the Transmission Mount.
20. Tap a $\frac{1}{2}$ "-20 thread into a 35B9 sprocket and screw onto end of motor assy. Replace left-hand Dewalt screw into sprocket shaft using lock-tite and an extra thick washer (mcmaster #98099A029). Finished product (without servo shifters) shown below (fig 24).



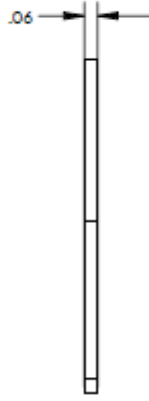
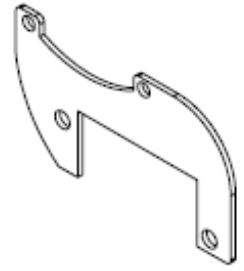
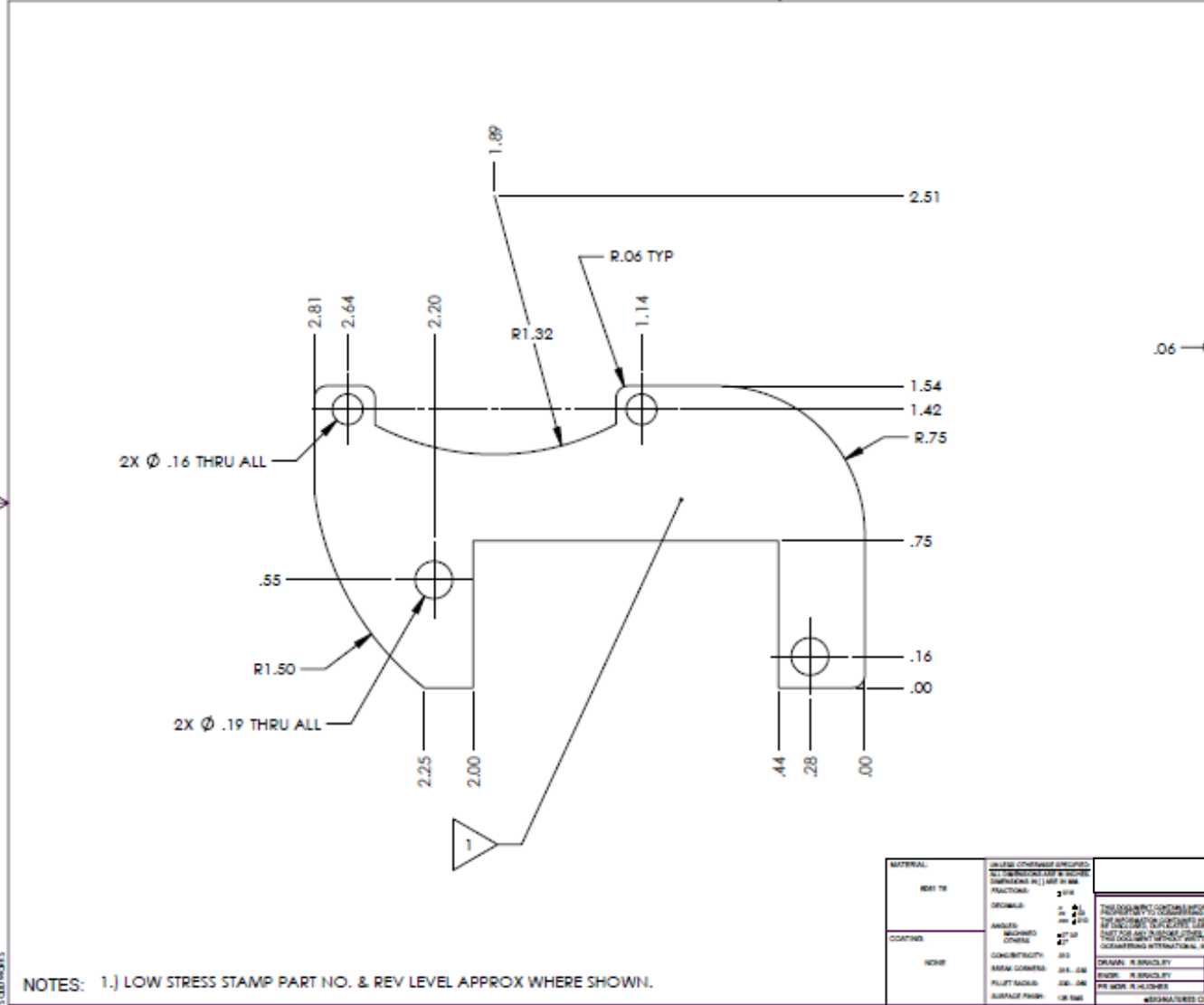
Figure 24

Parts List

Item	Amt	Detail
9 tooth drive sprocket	1	9 tooth 35B9
Extra-Thick Flat Washer	1	#98099A029
Left hand screw	1	Standard Dewalt
Dewalt XRP transmission	1	Standard Dewalt DC940
CIM Motors	1	2.5" CIMs
Servo shifter wire	1	.0625" bent per NEW specs
Set screw for Sun gear adapter	1	#8-32 x 3/8"
Servos	1	Hitech HS-322
Keystock		2 mm
Socket head cap screws	4	#6-32, 2.25" long
Flat head socket screws	2	#10-32, 0.5" long

Machine Drawings

REVISE			
REV	DESCRIPTION	ISSUED BY	DATE
INITIAL RELEASE		RHM	08 JAN 08



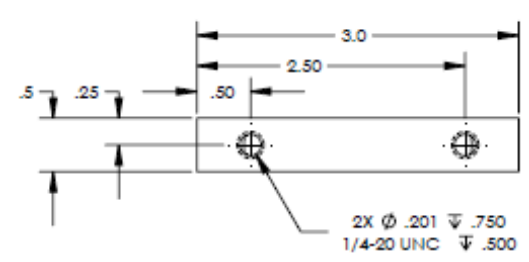
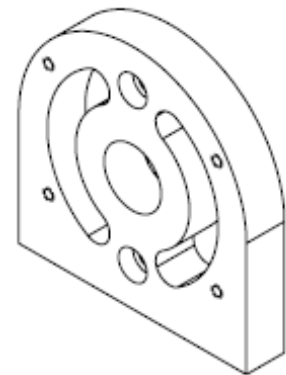
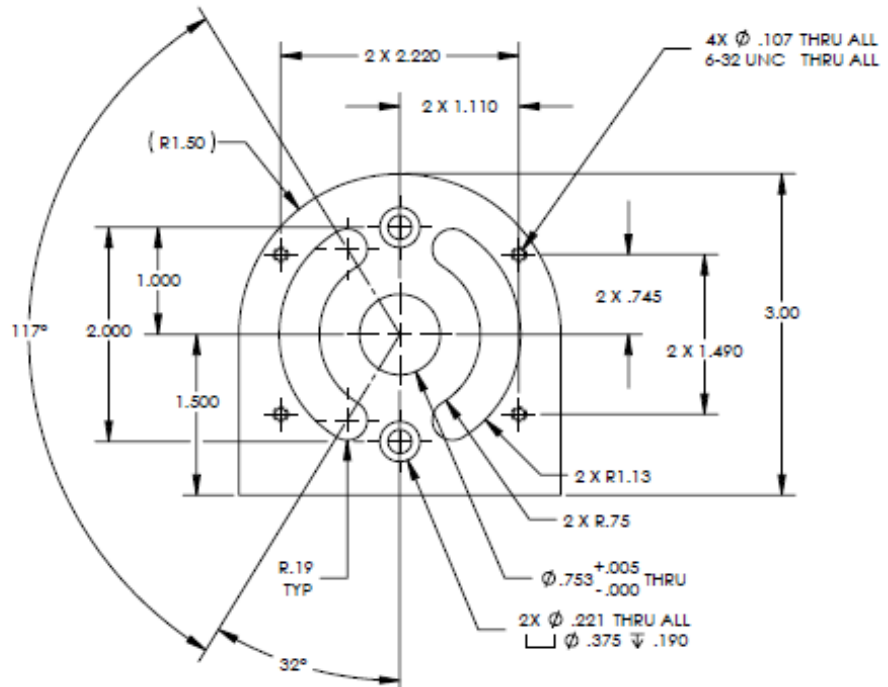
NOTES: 1.) LOW STRESS STAMP PART NO. & REV LEVEL APPROX WHERE SHOWN.

1.00 DIMENSIONS

FORM F019, REV. D (208)

MATERIAL		UNLESS OTHERWISE SPECIFIED ALL DIMENSIONS ARE IN INCHES DIMENSIONS IN () ARE IN MM FRACTIONS: 2/16	TITLE	
KEY TO	DECIMALS: 1/16 1/32 3/64 1/8 1/4 3/8 1/2	ANGLES: 30° 45° 60° 90° 120° 135° 150° 180°	SERVO MOUNT PLATE CINCO RANCH FRC ROBOTICS DETAIL	
COATING	NONE	CONCENTRICITY: .01	DRAWN: R. BRIDLEY	DATE: 08 JAN 08
		BREAK CORNERS: 1/4 .08	ENGR: R. BRIDLEY	DATE: 08 JAN 08
		FILLET RADIUS: .06 .08	PREP: R. BRIDLEY	DATE: 08 JAN 08
		SURFACE FINISH: UN FIN	APPROVED: [Signature]	
THIS DRAWING IS THE PROPERTY OF CINCORANCH FRC ROBOTICS. IT IS TO BE USED ONLY FOR THE PROJECTS OF CINCORANCH FRC ROBOTICS. IT IS NOT TO BE REPRODUCED OR TRANSMITTED IN ANY FORM OR BY ANY MEANS, ELECTRONIC OR MECHANICAL, INCLUDING PHOTOCOPYING, RECORDING, OR BY ANY INFORMATION STORAGE AND RETRIEVAL SYSTEM, WITHOUT THE WRITTEN PERMISSION OF CINCORANCH FRC ROBOTICS.			3RD ANGLE PROJECTION DO NOT SCALE SCALE: B SIZE: B TITLE NO: 0337923 SHEET: 1 OF 1	

REVISIONS		
REV	DESCRIPTION	DATE
1	INITIAL RELEASE	30 JAN 98

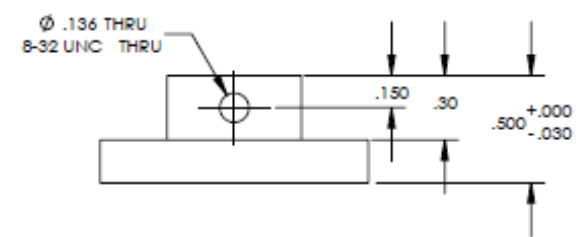
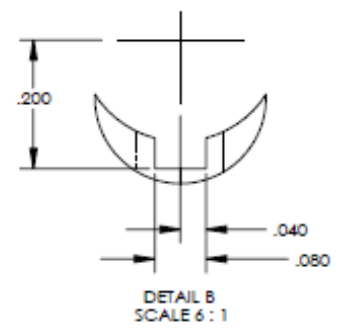
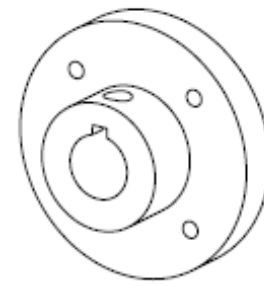
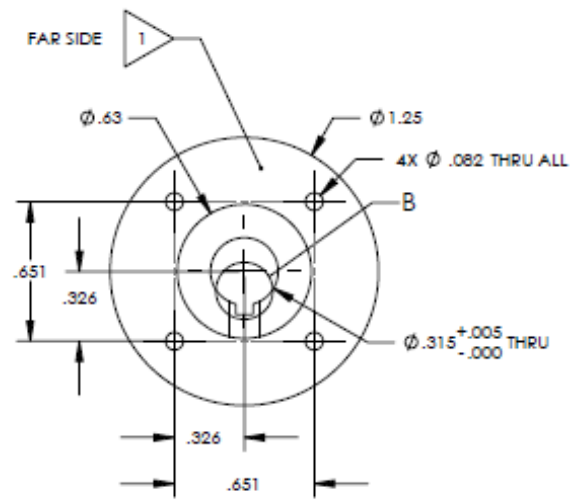


NOTES:

FORM 1019, Rev. 0 (08)

MATERIAL:	UNLESS OTHERWISE SPECIFIED: ALL DIMENSIONS ARE IN INCHES DIMENSIONS IN PARENTHESES ARE FRACTIONS	2 1/4	THIS DOCUMENT CONTAINS INFORMATION WHICH IS PROPRIETARY TO SCRAMBLING INTERNATIONAL, INC. THE INFORMATION CONTAINED HEREIN IS UNCLASSIFIED EXCEPT WHERE SHOWN OTHERWISE AND IS NOT TO BE DISSEMINATED OR RELEASED TO THE PUBLIC IN ANY MANNER WITHOUT THE WRITTEN AUTHORIZATION OF SCRAMBLING INTERNATIONAL, INC.	TITLE	TRANSMISSION MOUNT CINCO RACH FRC ROBOTICS DETAIL
COATING:	NONE	DRAWN: RRR/CLY DATE: 08 JUN 98 ENGR: RRR/CLY DATE: 08 JUN 98 PLOT: RRR/CLY DATE: 08 JUN 98 SURFACE FINISH: 12.5 RA		DATE: 08 JUN 98 DATE: 08 JUN 98 DATE: 08 JUN 98	3RD ANGLE PROJECTION SIZE B DWG NO. 0337925 SCALE: 1/16" = 1"

REVISED			
REV	DESCRIPTION	APPROVED BY	DATE
1	INITIAL RELEASE	RWB	08 JAN 08



NOTES: 1.] LOW STRESS STAMP PART NO. & REV LEVEL APPROX WHERE SHOWN.

MATERIAL	UNLESS OTHERWISE SPECIFIED ALL DIMENSIONS ARE IN INCHES DIMENSIONS IN 1/16" ARE FRACTIONS	TITLE	
REV TO	QTY	ADAPTER, SUN GEAR	
COATING	QTY	CINCO RANCH FRC ROBOTICS DETAIL	
QTY	QTY	3RD ANGLE PROJECTION	DO NOT SCALE
QTY	QTY	REV	REV
QTY	QTY	B	1
QTY	QTY	0337924	1
QTY	QTY	SCALE	SHEET 1 OF 1

SCALEWORKS

KORNF031, Rev. 0 (08)