



Model: See Affected Equipment Serial #: N/A	Apr. 27, 2021
Product Bulletin # CDS-004 Alert	



17-7/8" to 20" ICDS Grapple Retention Retrofit Solution

Issue

A dropped-object incident occurred, directly caused by a malfunctioning top drive, in which two ICDS tool grapples were damaged and fell to the rig floor.

Canrig recommends the following course of action to prevent such incidents from occurring in the future.

Affected Equipment

All 17-7/8" to 20" ICDS tools regardless of the date of manufacture.

Background

With the current 17-7/8" to 20" ICDS design, the grapples are required to be securely fastened when rotating while the grapples are NOT stabbed into the casing. Refer to the CDS Installation and Operations Guide – Document # 883003 (Currently Rev. 16 at the time this bulletin was published) for related Warnings and Information on when and how to securely fasten the grapples.

During troubleshooting, the top drive suddenly and unintentionally rotated at approximately 90 rpm while the grapples of the 18-5/8" ICDS tool were NOT stabbed into the casing. In these very rare conditions, the generated centrifugal force allowed the grapples to move away from the mandrel and collide with the CDS elevator links. As a result, two heavily damaged grapples fell to the rig floor. There was no personnel injury.

A grapple retention retrofit solution is required to prevent a similar dropped-object incident under the same unusual conditions.





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Actions Required to Retrofit Existing Equipment

Take the actions to retrofit the 17-7/8" to 20" ICDS tools and CDS-HPU Control Panels by following the steps 1 to 8 below.

1. Dismantle the CDS – See Figure 1 and Figure 2 (Casing Stop Bumper and Collar and Spearhead Assembly not shown).

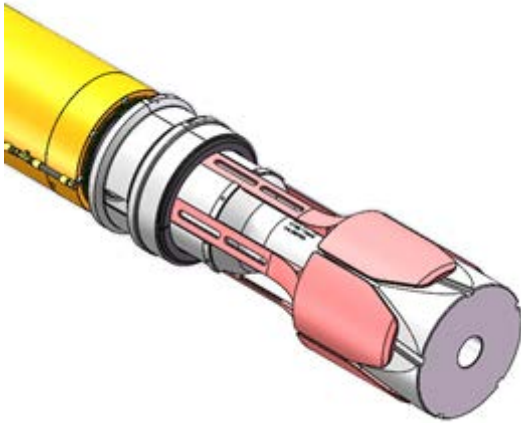


Figure 1

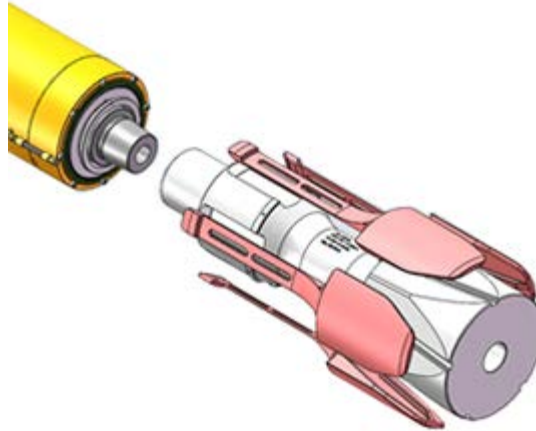


Figure 2

- Remove the Spearhead Assembly and Grapples from the CDS tool.
- Refer to the CDS Installation and Operations Guide – Document # 883003 for instructions on how to remove the grapples.
- Determine the grapple serviceability:

Refer to the CDS Maintenance Guide – Document # 883004 (Currently Rev. 17 at the time this bulletin was published).

- Disassemble the Mandrel from the CDS actuator and determine serviceability:

Refer to the CDS Maintenance Guide – Document # 883004 for instructions on how to break-out the mandrel and determine serviceability.



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2. Modification of 'on-hand' Mandrel(s) – P/N: 860207 Rev. 0 – See Figure 3.

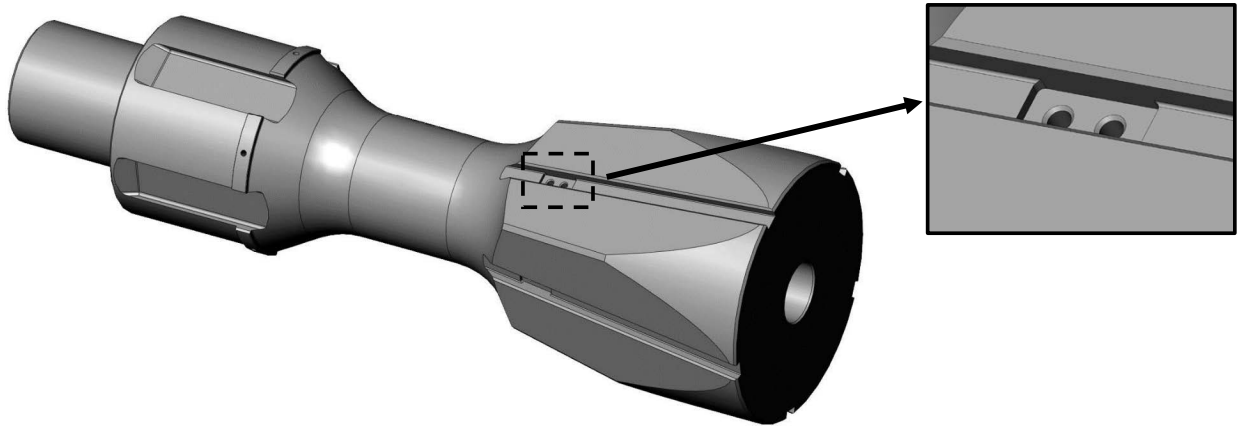


Figure 3

- Machine the slots, drill and thread the holes as per P/N: 5101740 – Mandrel, 17-7/8" – Modified for grapple retention.
- Refer to Appendix A for drawing 5101740.

3. Modification of 'on hand' Grapples – (all grapple sizes 17-7/8" to 20") - qty. 5 per set – See Figure 4.

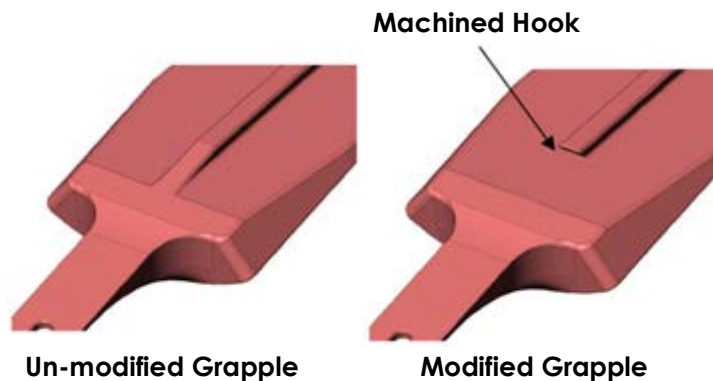


Figure 4

- If it is determined that the grapples are still serviceable, modify the grapples' rib as per P/N: 5101741 – Grapple, 17-7/8" – 20", Modified for retention.
- Refer to Appendix B for drawing 5101741.



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- Grapples that qualify for modification/retrofit:

Drawing # 80183502 Rev4 – 17-7/8" & 18-5/8" Casing

Casing		Part No.
NOM. DIA	WEIGHT	
17-7/8"	93.5 LB	860206
18-5/8"	73.1–87.5 LB	17714
18-5/8"	94.5–123.4 LB	860180
18-5/8"	136 LB	5039531

Drawing # 860134 Rev2 – 20" Casing

Casing		Part No.
NOM. DIA	WEIGHT	
20"	90–133 LB	820015
20"	169 LB	860129

4. Grapple Retainers Procurement – See Figure 5 on page 5.
 - a. Procure P/N: 5101745 – Kit, Grapple retention, 17-7/8" to 20" grapples – from RIGLINE 24/7™. The kit includes the following parts:

Grapple Retention Kit, 17-7/8" to 20" Grapples - Canrig P/N: 5101745

Item	Part No.	Qty.	Description
1	5101742	5	Retainer, Grapple, 17-7/8" to 20", ICDS
2	5033127	12	Washer, Lock, Nord-Lock, Stl, 1/2", 0.1" Thk
3	1045	12	Screw, Cap, SktHd, 1/2"-13UNCx1", A574
4	5101750	1	Wrench, Allen Bit Socket, 3/8" hex drive, 1/2" square drive

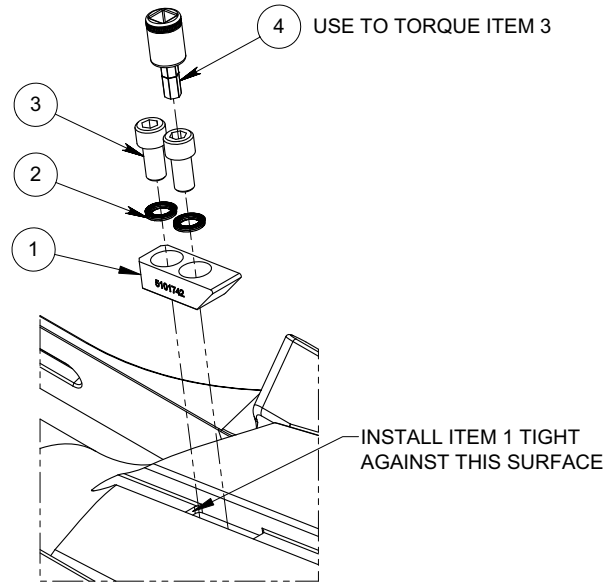


Figure 5

5. Assemble P/N: 5101742 – Grapple Retainers (qty. 5) – on the modified mandrel.
 - Refer to Figure 6 for the assembling detail.

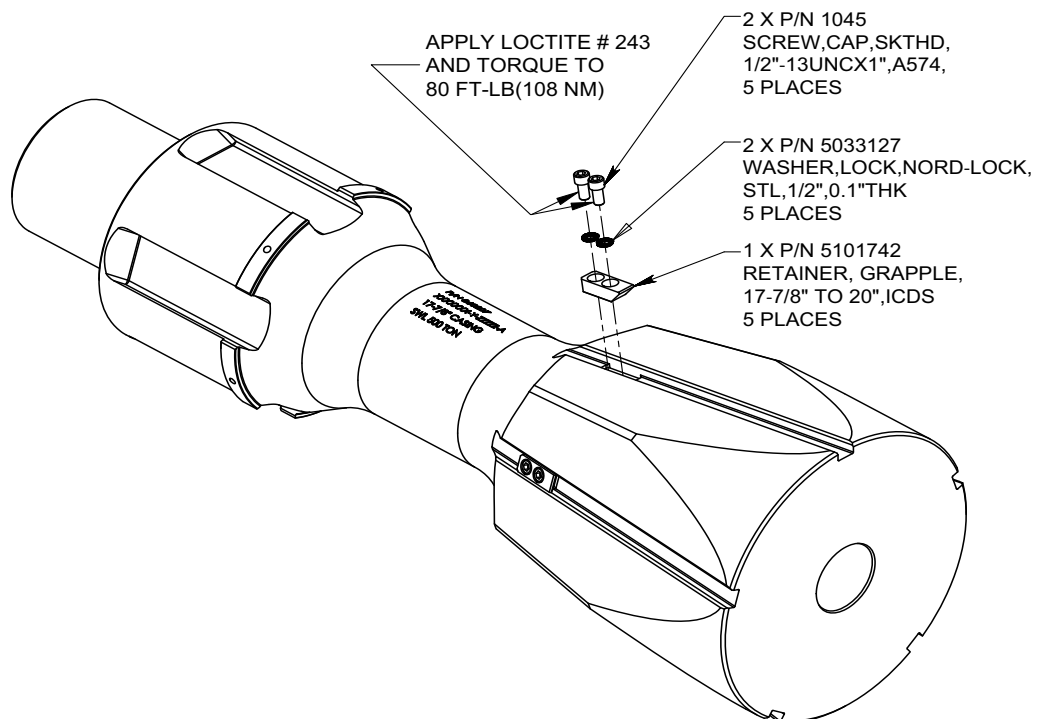


Figure 6



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- Apply Loctite #243 to the screws.
- Ensure the correct orientation of the Grapple Retainer.
- Ensure the proper installation of the Nord-Lock washers.
- Ensure the retainer is tight to the face of the pocket before the cap screws are tightened.
See Figure 7:

Ensure the retainer is
tight against face of
the pocket

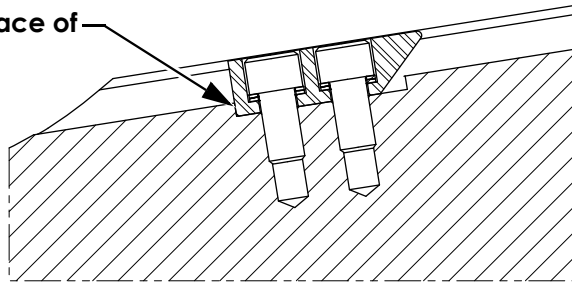


Figure 7

- Use P/N: 50101750 – Allen Bit Socket and appropriate Torque Wrench to tighten the screws to 80 ft-lb.
6. Re-assemble the Drive with modified mandrel to the actuator.
 - Refer to the CDS Maintenance Guide – Document # 883004 for instructions on how to re-install the mandrel and other Drive components to the Actuator.
 7. Install modified Grapples.
 - Refer to the CDS Installation and Operations Guide – Document # 883003 for instructions on how to install the grapples.



Warning! When the modified grapples are stroked-in/retracted while the retrofit 17-7/8" ICDS is in horizontal position, ensure that the grapples positioned in the lower side are not moving away from the mandrel's ramps due to the gravity forces. Failure to maintain the lower side grapples close to the mandrel's ramps (in actuator release/open mode) may result in damage to the grapples and/or grapple retainers.



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Note: The P/N: 5059088 – Grapple Retainer Band – (see Figure 8), is still required for retrofitted 17-7/8" – 20" ICDS tools.

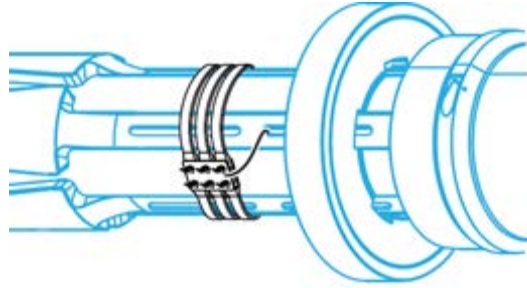


Figure 8



Caution! For complete engagement and effectiveness of the grapple retention mechanism, the grapples and actuator must be in a fully-released state, which is ensured by applying constant release hydraulic pressure.

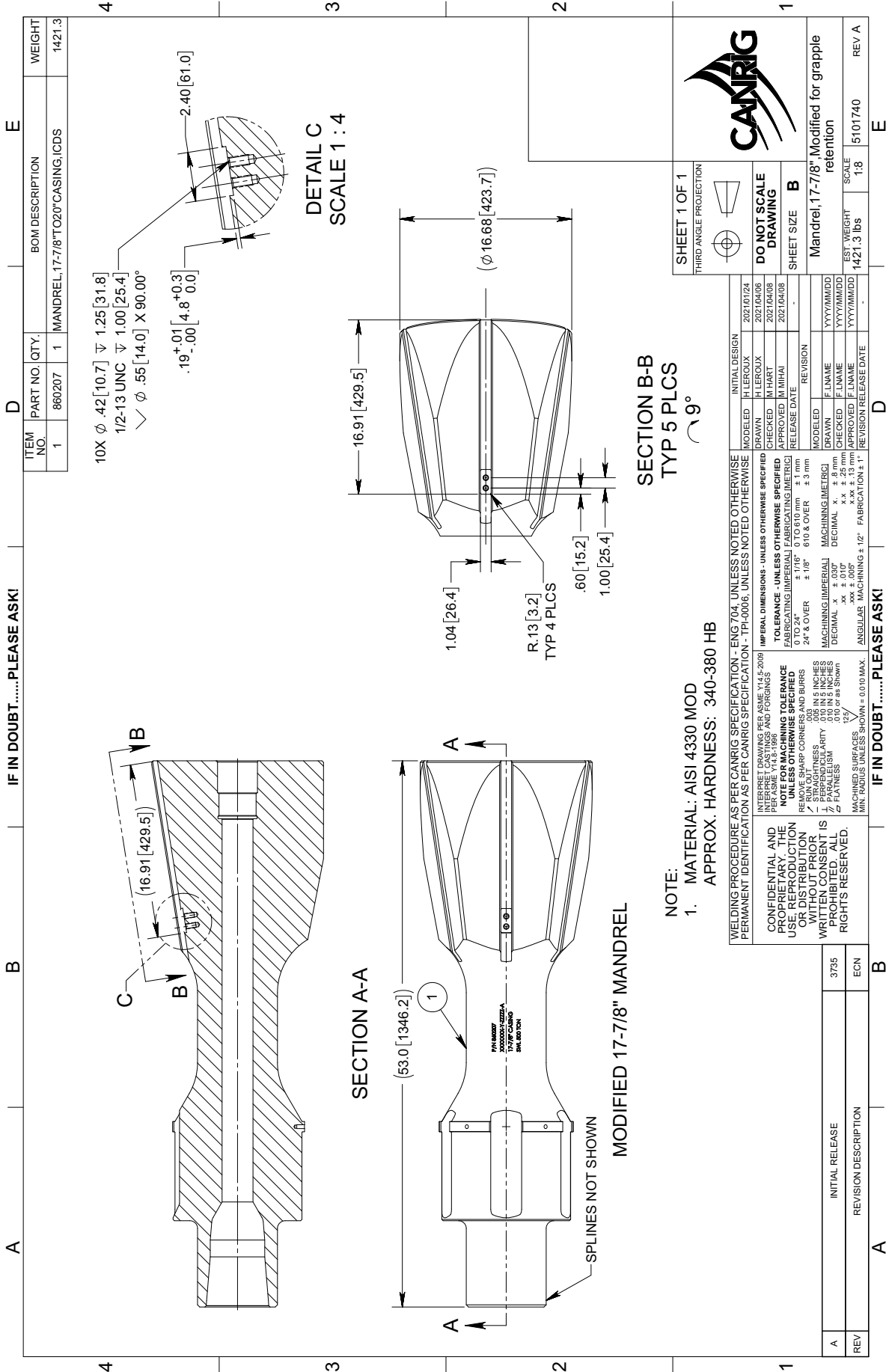
8. Install P/N 5102155 (Kit, CDS control function lock) on the CDS control panel to provide a means to constantly apply release hydraulic pressure.
 - Procure P/N 5102155 Kit from RIGLINE 24/7™.
 - Follow the installation instructions on the drawing no. 5102155 (See Appendix C) to install the kit.
 - To apply constant release pressure to the CDS actuator, move the Apply/Release and Safety release function levers to RELEASE mode and slide the pins into the holes in the function locks. This will prevent the levers from moving back to the neutral position.

Information on New Mandrels and New Grapples

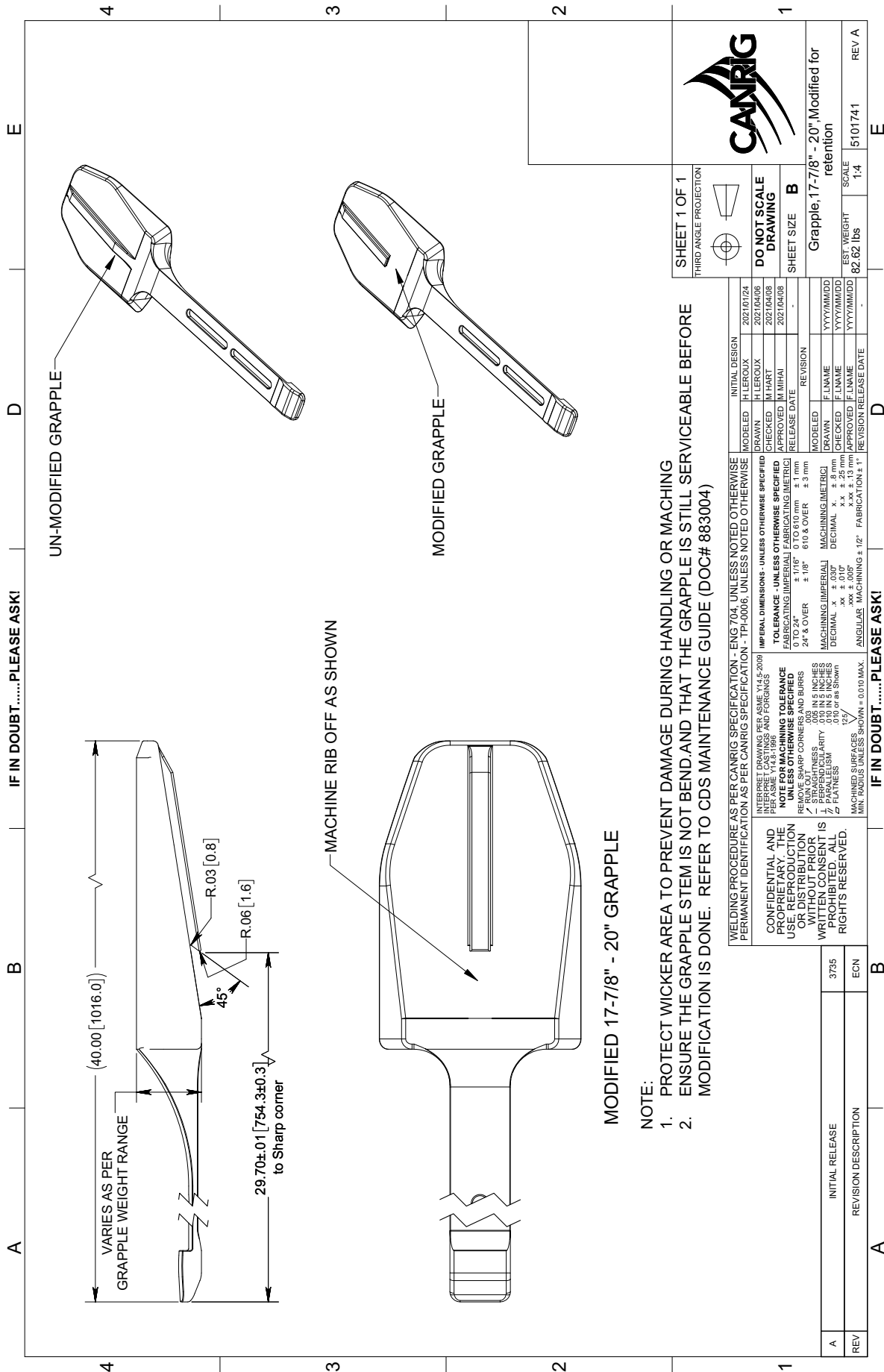
New mandrels and new grapples will now include embedded retaining features.

- Old grapples will require rework as per Step 3 above to be compatible with the new mandrels.
- New grapples are backwards compatible with old mandrels, but the retaining function would not be available.
- New grapples are compatible with old mandrels reworked as per Steps 2, 4, and 5.
- Above note about grapple retainer band applies.

Appendix A - P/N: 5101740 - Mandrel, 17-7/8", Modified for grapple retention



Appendix B – P/N: 5101741 – Grapple, 17-7/8" – 20", Modified for retention



MODIFIED 17-7/8" - 20" GRAPPLE

NOTE:

1. PROTECT WICKER AREA TO PREVENT DAMAGE DURING HANDLING OR MACHINING
2. ENSURE THE GRAPPLE STEM IS NOT BEND AND THAT THE GRAPPLE IS STILL SERVICEABLE BEFORE MODIFICATION IS DONE. REFER TO CDS MAINTENANCE GUIDE (DOC# 883004)

WELDING PROCEDURE AS PER CANRIG SPECIFICATION - ENG 704, UNLESS NOTED OTHERWISE		PERMANENT IDENTIFICATION AS PER CANRIG SPECIFICATION - TPI-0006, UNLESS NOTED OTHERWISE		INITIAL DESIGN	
INTERPRET DRAWING PER ASME Y14.5-2009		INFERRED CASTINGS AND FORGINGS		MODELED	H LEROUX
CONFIDENTIAL AND PROPRIETARY. THE USE, REPRODUCTION OR DISTRIBUTION WITHOUT PERMIT IS PROHIBITED. ALL RIGHTS RESERVED.		NOTE FOR MACHINING TOLERANCE		DRAWN	H LEROUX
		FROM SHARP CORNERS AND BURRS		CHECKED	M MIHAL
		- STRAIGHTNESS .006 IN 5 INCHES		APPROVED	M MIHAL
		- PARALLELISM .010 IN 5 INCHES		RELEASE DATE	2021/04/08
		- FLATNESS .020 or as Shown		REVISION	
		MACHINED SURFACES		MODELED	YYYYMMDD
		MIN. RADIUS UNLESS SHOWN = 0.010 MAX.		DRAWN	YYYYMMDD
		ANGULARS MACHINING ± 12°		CHECKED	YYYYMMDD
				APPROVED	YYYYMMDD
				F.L.NAME	5101741
				F.L.NAME	5101741
				EST. WEIGHT	82.62 lbs
				SCALE	1:4
				REVISION RELEASE DATE	

SHEET 1 OF 1



DO NOT SCALE DRAWING

SHEET SIZE B



Grapple, 17-7/8" - 20", Modified for retention

REV A

IF IN DOUBT.....PLEASE ASK!

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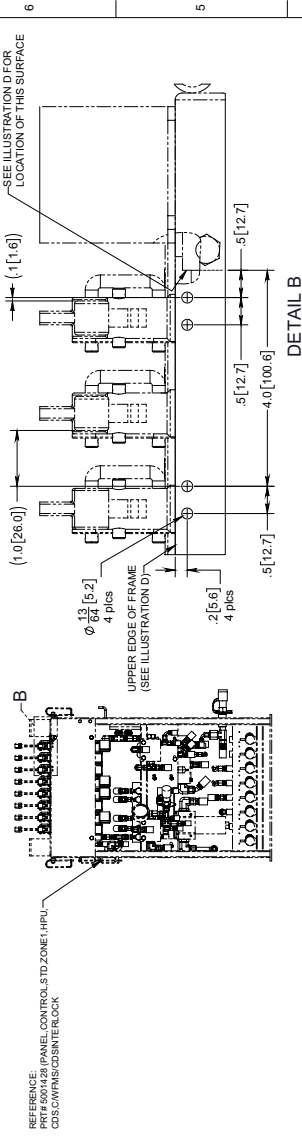
Appendix C – P/N: 5102155 – Kit, CDS control function lock

IF IN DOUBT...PLEASE ASK!

ITEM NO.	NUMBER	DESCRIPTION	QTY.	WEIGHT
1	5102152	LOCK ACTUATOR RELEASE CONTROL, CDS CONTROL PANEL	1	0.1
2	5101433	LOCK SAFETY RELEASE CONTROL, CDS CONTROL PANEL	1	0.1
3	5101432	SCREW, CAP, SKT HD #10-ZAUNCX58" LG	4	0.017
4	0972	NUT, HEX, #10 - ZAUNC, PLD	4	0.01
5	5102152	SCREW, MODIFIED, 1/4"-20UNC, CDS CONTROL FUNCTION LOCK	2	0.058
6	0980	NUT, HEX, 1/4" - 20UNC, GR8, PLD	2	0.023

INSTALLATION INSTRUCTIONS

1. DRILL HOLES IN CDS CONTROL PANEL FRAME AS SHOWN BELOW.

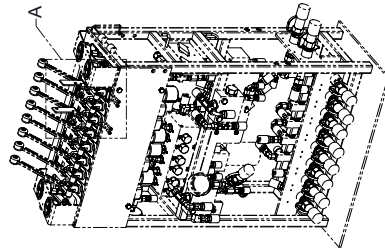


DETAIL B

- IF INSTALLED, REMOVE THE CURRENT LOCK PLATE (PR# 500166) FROM THE VALVE BANK.
- INSTALL FUNCTION LOCKS (ITEMS 1 & 2) AS SHOWN IN DETAIL A USING ITEMS 3 & 4. NOTE THE SPECIFIC LOCATION OF ITEMS.
- INSTALL 1/4" BOLTS (ITEMS 5) INTO THE HANDLES OF "APPLY/RELEASE" AND "SAFETY RELEASE" FUNCTION LEVERS AS SHOWN IN ILLUSTRATION E. APPLY LOCITITE 243 ONTO THE THREADS OF THE BOLTS AND INSERT THE NUTS (ITEM 6). SCREW THE NUTS IN ALL THE WAY TO THE END OF THE THREAD. TIGHTEN THE NUTS SLIGHTLY TO ACTIVATE THE LOCITITE THREADLOCKER. CAREFUL NOT TO STRIP THE NUTS.

DETAIL A

DIMENSION FROM THIS SURFACE
UPPER EDGE OF FRAME



ISO VIEW NUTS

ILLUSTRATION D

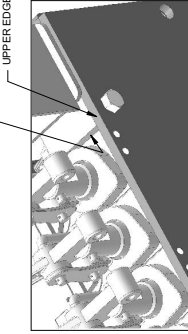
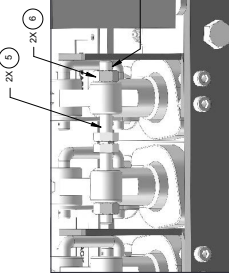


ILLUSTRATION E



APPROXIMATELY 3/16" OF THREAD SHOULD STICK OUT FROM THE NUT.

REV	DESCRIPTION	DATE	BY	CHKD	ECN
A	INITIAL DESIGN				
	REVISION DESCRIPTION				

WELDING PROCEDURE AS PER CANRIG SPECIFICATION - ENG 704 UNLESS NOTED OTHERWISE	PERMANENT IDENTIFICATION AS PER CANRIG SPECIFICATION - TP-0004 UNLESS NOTED OTHERWISE	MODELLED	INITIAL DESIGN
		H I LEROUX	2021 04 14
		DRAWN	2021 04 15
		APPROVED	2021 04 16
		RELEASE DATE	
		REVISION	
		DRAWN	YYYYMMDD
		CHECKED	YYYYMMDD
		APPROVED	YYYYMMDD
		REVISION RELEASE DATE	

NOTE FOR MACHINING TOLERANCE	REVISION
±0.125mm	1
±0.100mm	2
±0.075mm	3
±0.050mm	4
±0.025mm	5
±0.0125mm	6

MATERIAL SPECIFICATION	UNIT	DESCRIPTION
304	SS	304 STAINLESS STEEL
6061	AL	6061 ALUMINUM
7050	AL	7050 ALUMINUM
4140	STEEL	4140 STEEL
316	SS	316 STAINLESS STEEL
303	SS	303 STAINLESS STEEL
316L	SS	316L STAINLESS STEEL
304L	SS	304L STAINLESS STEEL
310	SS	310 STAINLESS STEEL
309	SS	309 STAINLESS STEEL
314	SS	314 STAINLESS STEEL
312	SS	312 STAINLESS STEEL
308	SS	308 STAINLESS STEEL
315	SS	315 STAINLESS STEEL
317	SS	317 STAINLESS STEEL
318	SS	318 STAINLESS STEEL
319	SS	319 STAINLESS STEEL
320	SS	320 STAINLESS STEEL
321	SS	321 STAINLESS STEEL
322	SS	322 STAINLESS STEEL
323	SS	323 STAINLESS STEEL
324	SS	324 STAINLESS STEEL
325	SS	325 STAINLESS STEEL
326	SS	326 STAINLESS STEEL
327	SS	327 STAINLESS STEEL
328	SS	328 STAINLESS STEEL
329	SS	329 STAINLESS STEEL
330	SS	330 STAINLESS STEEL

ANGULAR	MAXIMUM	±	FABRICATION	DATE
15.0	LB			

SHEET 1 OF 1
THIRD ANGLE PROJECTION



DO NOT SCALE DRAWING

SHEET SIZE D

Ki, CDS control function lock

SCALE 5102155

REV A

IF IN DOUBT...PLEASE ASK!