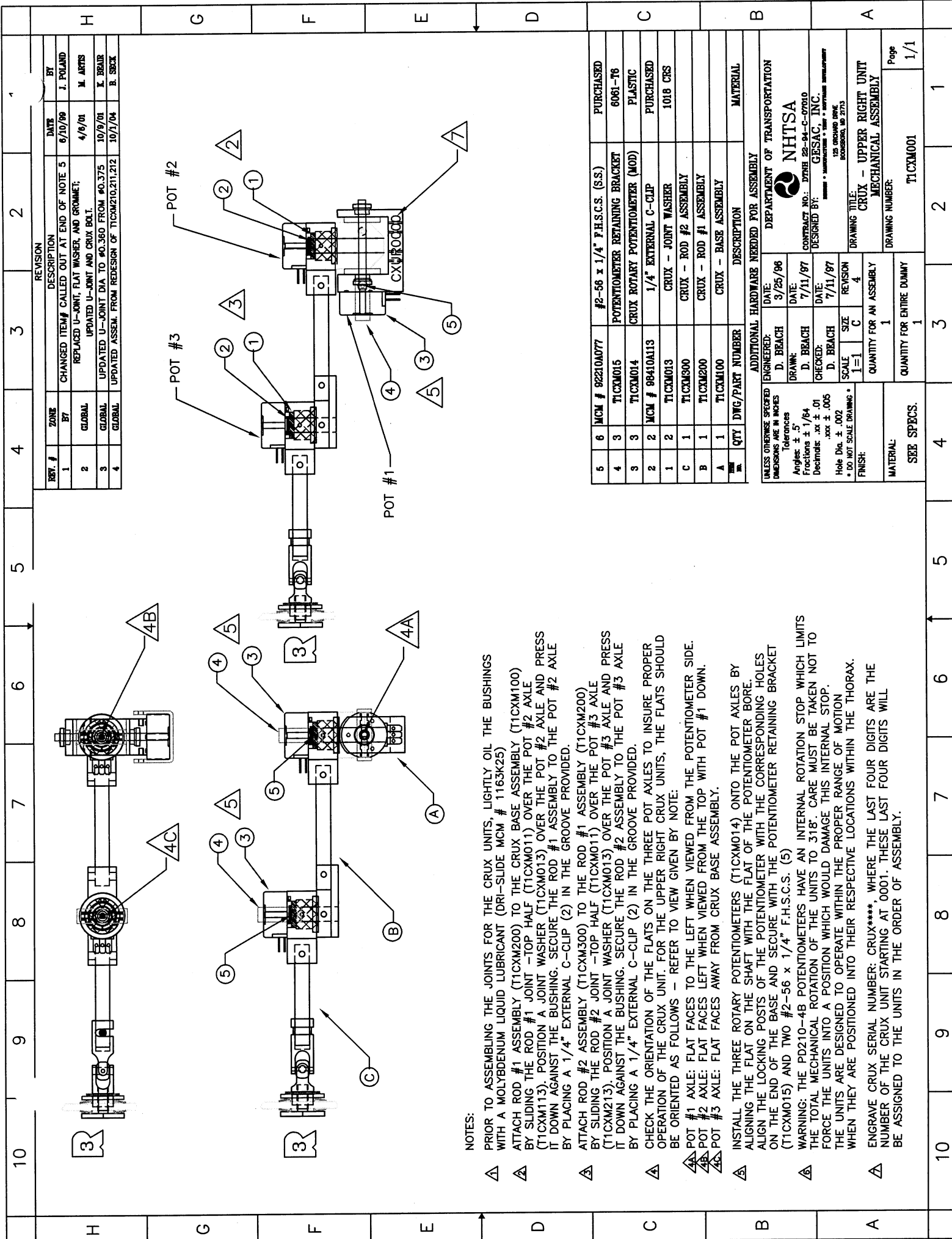


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J	I	H	G	F	E	D	C	B	A																																																							
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8	10/26/94	UPDATED PART LISTS AND DIMENSIONS WITH TIUM000 AND TIUM000 PART LISTS	B. SECK																																																													
<p>NOTES:</p> <p>△ THE CRUX UNITS ARE DESIGNED AND ASSEMBLED TO OPERATE IN ONE SPECIFIC POSITION WITHIN THE THORAX. IT IS NECESSARY TO POSITION AND ORIENT THE UNITS CORRECTLY TO ENSURE THE PROPER RANGE OF MOTION.</p> <p>△ THE BASES OF THE TWO UPPER CRUX UNITS ARE ATTACHED TO THE UPPER ABDOMEN SPINAL MOUNTING BRACKET (TIUM000) (SPECIFICALLY TIUM113) USING TWO #10-24 x 5/8" F.H.S.C.S. FOR EACH UNIT. THE BASE POTENTIOMETERS ARE POSITIONED TO THE OUTSIDE AS SHOWN.</p> <p>△ THE BASES OF THE TWO LOWER CRUX UNITS ARE MOUNTED TO THE LOWER UNIT MOUNTING PLATES (TICX400 AND TICX401) FOR THE LEFT AND RIGHT SIDES RESPECTIVELY. THE UNITS AND MOUNTING PLATES ARE ORIENTED SO THAT THE LETTERS (L & R) STAMPED ON THE MOUNTING PLATES ARE FACING OUTWARD AND RIGHT SIDE UP ON EACH SIDE. THE CRUX POTENTIOMETER #1 IS ORIENTED TO FACE IN THE UPWARD DIRECTION AS SHOWN.</p> <p>△ THE LOWER CRUX MOUNTING PLATES ARE ATTACHED TO THE SIDES OF THE UPPER ABDOMEN SPINAL MOUNT WELDMENT (TIUM113) USING TWO 1/4-20 x 3/8" F.H.S.C.S. ON EACH SIDE.</p> <p>△ THE LOWER CRUX UNITS ARE DESIGNED TO OPERATE WITH THE BEND OF THE ELBOW JOINT POINTING IN THE UPWARD DIRECTION AS SHOWN.</p> <p>△ THE UPPER ABDOMEN INSTRUMENTATION MOUNTING PLATE (TIUM000) IS MOUNTED TO THE UPPER ABDOMEN SPINAL MOUNT WELDMENT (TIUM113) USING ONE 1/4-20 x 1/2" B.H.S.C.S. ON EACH SIDE. THESE BOLTS SECURE THE WIRES FOR THE CRUX UNITS WITH A WIRE CLAMP AS SHOWN IN TICX000.</p> <p>△ SEE ASSEMBLY DRAWING TITX000 FOR FURTHER INSTRUCTIONS.</p> <p>△ THE UPPER ABDOMEN ASSEMBLY IS SHOWN FOR REFERENCE ONLY.</p>																																																																
<table border="1"> <tr> <th>QTY</th> <th>DWG/PART NUMBER</th> <th>DESCRIPTION</th> <th>MATERIAL</th> </tr> <tr> <td>6</td> <td>1</td> <td>TICX401</td> <td>MOUNTING PLATE - LEFT SIDE</td> <td>1018 CRS</td> </tr> <tr> <td>4</td> <td>1</td> <td>TICX400</td> <td>MOUNTING PLATE - RIGHT SIDE</td> <td>1018 CRS</td> </tr> <tr> <td>3</td> <td>4</td> <td>MCM # 91253A240</td> <td>#10-24 x 3/8" F.H.S.C.S. (ALLOY)</td> <td>PURCHASED</td> </tr> <tr> <td>2</td> <td>4</td> <td>MCM # 91253A535</td> <td>1/4 - 20 x 3/8" F.H.S.C.S. (ALLOY)</td> <td>PURCHASED</td> </tr> <tr> <td>1</td> <td>4</td> <td>MCM # 91253A244</td> <td>#10-24 x 5/8" F.H.S.C.S. (ALLOY)</td> <td>PURCHASED</td> </tr> <tr> <td>D</td> <td>1</td> <td>TICX005</td> <td>CRUX - LOWER RIGHT UNIT</td> <td></td> </tr> <tr> <td>C</td> <td>1</td> <td>TICX001</td> <td>CRUX - UPPER RIGHT UNIT</td> <td></td> </tr> <tr> <td>B</td> <td>1</td> <td>TICX002</td> <td>CRUX - UPPER LEFT UNIT</td> <td></td> </tr> <tr> <td>A</td> <td>1</td> <td>TICX004</td> <td>CRUX - LOWER LEFT UNIT</td> <td></td> </tr> </table>																QTY	DWG/PART NUMBER	DESCRIPTION	MATERIAL	6	1	TICX401	MOUNTING PLATE - LEFT SIDE	1018 CRS	4	1	TICX400	MOUNTING PLATE - RIGHT SIDE	1018 CRS	3	4	MCM # 91253A240	#10-24 x 3/8" F.H.S.C.S. (ALLOY)	PURCHASED	2	4	MCM # 91253A535	1/4 - 20 x 3/8" F.H.S.C.S. (ALLOY)	PURCHASED	1	4	MCM # 91253A244	#10-24 x 5/8" F.H.S.C.S. (ALLOY)	PURCHASED	D	1	TICX005	CRUX - LOWER RIGHT UNIT		C	1	TICX001	CRUX - UPPER RIGHT UNIT		B	1	TICX002	CRUX - UPPER LEFT UNIT		A	1	TICX004	CRUX - LOWER LEFT UNIT	
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<p>ADDITIONAL HARDWARE NEEDED FOR ASSEMBLY</p> <p>ENGINEERED: DEPARTMENT OF TRANSPORTATION</p> <p>DRAWN: NHTSA</p> <p>CHECKED: CONTRACT NO. DTMB 82-94-C-0000</p> <p>DESIGNED BY: GESAC, INC.</p> <p>125 BROADWAY</p> <p>ROCKVILLE, MD 20850</p> <p>DRAWING TITLE: CRUX</p> <p>MECHANICAL ASSEMBLY TO THOR</p> <p>DRAWING NUMBER: TITX000</p> <p>MATERIAL: SEE SPECS.</p> <p>Page 1/1</p>																																																																

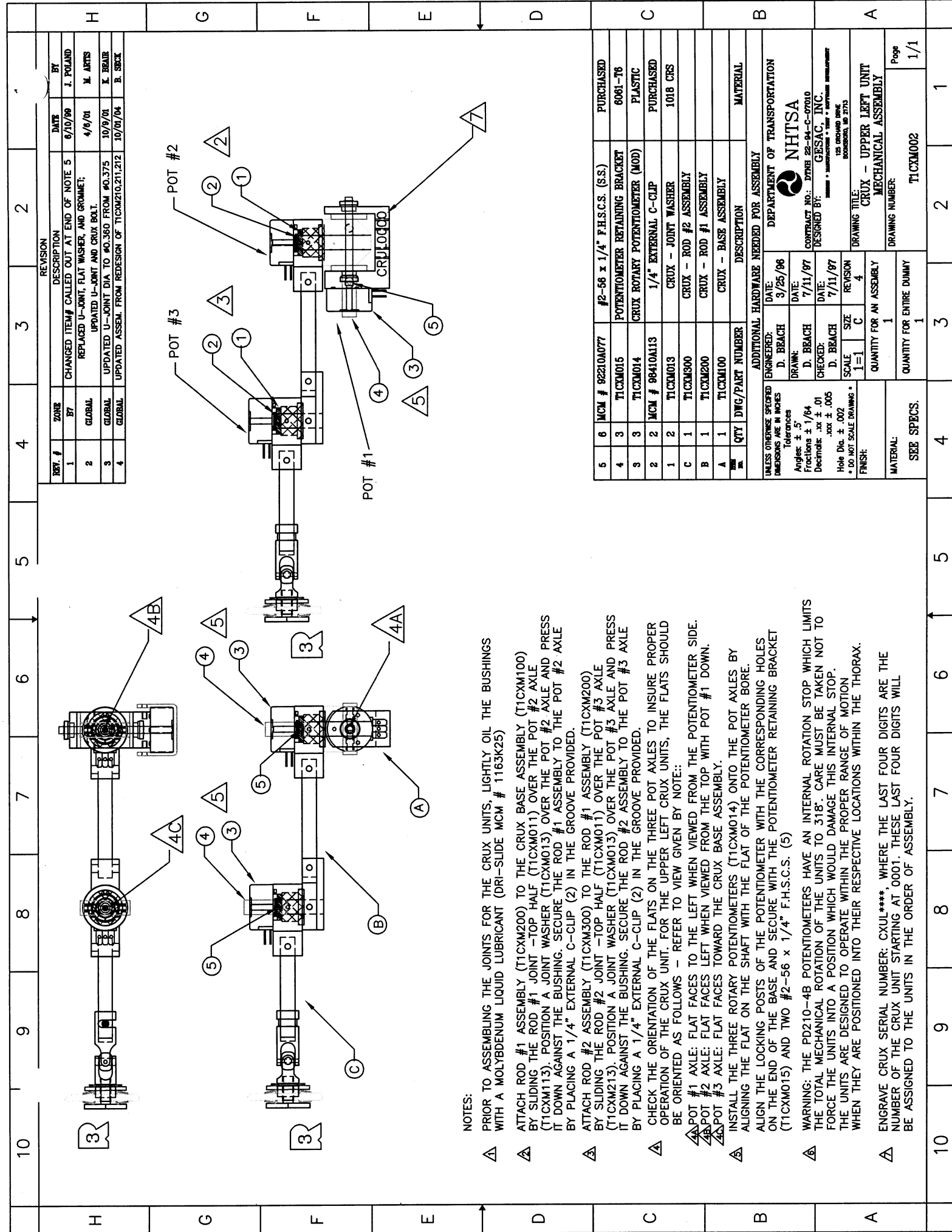


REV. #	ZONE	DESCRIPTION	DATE	BY
1	B7	CHANGED ITEM# CALLED OUT AT END OF NOTE 5	6/10/99	J. POLAND
2	GLOBAL	REPLACED U-JOINT, FLAT WASHER, AND GROMMET;	4/6/01	M. ARTYS
3	GLOBAL	UPDATED U-JOINT DIA TO #0.360 FROM #0.375	10/9/01	K. BEAIR
4	GLOBAL	UPDATED ASSEM. FROM REDESIGN OF T1CXM210,211,212	10/1/04	B. BECK

REV. #	ZONE	DESCRIPTION	DATE	BY
5	MCM # 92210A077	#2-56 x 1/4" F.H.S.C.S. (S.S.)		PURCHASED
4	T1CXM015	POTENTIOMETER RETAINING BRACKET		6061-T6
3	T1CXM014	CRUX ROTARY POTENTIOMETER (MOD)		PLASTIC
2	MCM # 98410A113	1/4" EXTERNAL C-CLIP		PURCHASED
1	T1CXM013	CRUX - JOINT WASHER		1018 CRS
C	T1CXM300	CRUX - ROD #2 ASSEMBLY		
B	T1CXM200	CRUX - ROD #1 ASSEMBLY		
A	T1CXM100	CRUX - BASE ASSEMBLY		

QTY	DWG/PART NUMBER	DESCRIPTION	MATERIAL
1		ADDITIONAL HARDWARE NEEDED FOR ASSEMBLY	
UNLESS OTHERWISE SPECIFIED:			
DIMENSIONS ARE IN INCHES			
Tolerances			
Angles: ± .5°			
Fractions: ± 1/64			
Decimals: .xx ± .01			
.xxx ± .005			
Hole Dia. ± .002			
• DO NOT SCALE DRAWING •			
FINISH:			
SCALE: 1=1 C			
REVISION: 4			
DATE: 7/11/97			
DRAWN: D. BEACH			
CHECKED: .xx ± .01			
DATE: 7/11/97			
ENGINEERED: D. BEACH			
DATE: 3/25/98			
DEPARTMENT OF TRANSPORTATION			
NHTSA			
CONTRACT NO.: DTN98-22-94-C-07010			
DESIGNED BY: GESAC, INC.			
125 ORLANDO BLVD.			
BOSSBORO, MD 21713			
DRAWING TITLE: CRUX - UPPER RIGHT UNIT MECHANICAL ASSEMBLY			
DRAWING NUMBER: T1CXM001			
Page 1/1			

- NOTES:
- ▲ PRIOR TO ASSEMBLING THE JOINTS FOR THE CRUX UNITS, LIGHTLY OIL THE BUSHINGS WITH A MOLYBDENUM LIQUID LUBRICANT (DRI-SLIDE MCM # 1163K25)
 - ▲ ATTACH ROD #1 ASSEMBLY (T1CXM200) TO THE CRUX BASE ASSEMBLY (T1CXM100) BY SLIDING THE ROD #1 JOINT -TOP HALF (T1CXM011) OVER THE POT #2 AXLE (T1CXM113). POSITION A JOINT WASHER (T1CXM013) OVER THE POT #2 AXLE AND PRESS IT DOWN AGAINST THE BUSHING. SECURE THE ROD #1 ASSEMBLY TO THE POT #2 AXLE BY PLACING A 1/4" EXTERNAL C-CLIP (2) IN THE GROOVE PROVIDED.
 - ▲ ATTACH ROD #2 ASSEMBLY (T1CXM300) TO THE ROD #1 ASSEMBLY (T1CXM200) BY SLIDING THE ROD #2 JOINT -TOP HALF (T1CXM011) OVER THE POT #3 AXLE (T1CXM213). POSITION A JOINT WASHER (T1CXM013) OVER THE POT #3 AXLE AND PRESS IT DOWN AGAINST THE BUSHING. SECURE THE ROD #2 ASSEMBLY TO THE POT #3 AXLE BY PLACING A 1/4" EXTERNAL C-CLIP (2) IN THE GROOVE PROVIDED.
 - ▲ CHECK THE ORIENTATION OF THE FLATS ON THE THREE POT AXLES TO INSURE PROPER OPERATION OF THE CRUX UNIT. FOR THE UPPER RIGHT CRUX UNITS, THE FLATS SHOULD BE ORIENTED AS FOLLOWS - REFER TO VIEW GIVEN BY NOTE:
 - ▲▲ POT #1 AXLE: FLAT FACES TO THE LEFT WHEN VIEWED FROM THE POTENTIOMETER SIDE.
 - ▲▲ POT #2 AXLE: FLAT FACES LEFT WHEN VIEWED FROM THE TOP WITH POT #1 DOWN.
 - ▲▲ POT #3 AXLE: FLAT FACES AWAY FROM CRUX BASE ASSEMBLY.
 - ▲ INSTALL THE THREE ROTARY POTENTIOMETERS (T1CXM014) ONTO THE POT AXLES BY ALIGNING THE FLAT ON THE SHAFT WITH THE FLAT OF THE POTENTIOMETER BORE. ALIGN THE LOCKING POSTS OF THE POTENTIOMETER WITH THE CORRESPONDING HOLES ON THE END OF THE BASE AND SECURE WITH THE POTENTIOMETER RETAINING BRACKET (T1CXM015) AND TWO #2-56 x 1/4" F.H.S.C.S. (5)
 - ▲ WARNING: THE PD210-4B POTENTIOMETERS HAVE AN INTERNAL ROTATION STOP WHICH LIMITS THE TOTAL MECHANICAL ROTATION OF THE UNITS TO 318°. CARE MUST BE TAKEN NOT TO FORCE THE UNITS INTO A POSITION WHICH WOULD DAMAGE THIS INTERNAL STOP. THE UNITS ARE DESIGNED TO OPERATE WITHIN THE PROPER RANGE OF MOTION WHEN THEY ARE POSITIONED INTO THEIR RESPECTIVE LOCATIONS WITHIN THE THORAX.
 - ▲ ENGRAVE CRUX SERIAL NUMBER: CRUX****, WHERE THE LAST FOUR DIGITS ARE THE NUMBER OF THE CRUX UNIT STARTING AT 0001. THESE LAST FOUR DIGITS WILL BE ASSIGNED TO THE UNITS IN THE ORDER OF ASSEMBLY.



NOTES:

- ▲ PRIOR TO ASSEMBLING THE JOINTS FOR THE CRUX UNITS, LIGHTLY OIL THE BUSHINGS WITH A MOLYBDENUM LIQUID LUBRICANT (DRI-SLIDE MCM # 1163K25)
- ▲ ATTACH ROD #1 ASSEMBLY (T1CXM200) TO THE CRUX BASE ASSEMBLY (T1CXM100) BY SLIDING THE ROD #1 JOINT -TOP HALF (T1CXM011) OVER THE POT #2 AXLE (T1CXM113). POSITION A JOINT WASHER (T1CXM013) OVER THE POT #2 AXLE AND PRESS IT DOWN AGAINST THE BUSHING. SECURE THE ROD #1 ASSEMBLY TO THE POT #2 AXLE BY PLACING A 1/4" EXTERNAL C-CLIP (2) IN THE GROOVE PROVIDED.
- ▲ ATTACH ROD #2 ASSEMBLY (T1CXM300) TO THE ROD #1 ASSEMBLY (T1CXM200) BY SLIDING THE ROD #2 JOINT -TOP HALF (T1CXM011) OVER THE POT #3 AXLE (T1CXM213). POSITION A JOINT WASHER (T1CXM013) OVER THE POT #3 AXLE AND PRESS IT DOWN AGAINST THE BUSHING. SECURE THE ROD #2 ASSEMBLY TO THE POT #3 AXLE BY PLACING A 1/4" EXTERNAL C-CLIP (2) IN THE GROOVE PROVIDED.
- ▲ CHECK THE ORIENTATION OF THE FLATS ON THE THREE POT AXLES TO INSURE PROPER OPERATION OF THE CRUX UNIT. FOR THE UPPER LEFT CRUX UNITS, THE FLATS SHOULD BE ORIENTED AS FOLLOWS - REFER TO VIEW GIVEN BY NOTE:
 - ▲ POT #1 AXLE: FLAT FACES TO THE LEFT WHEN VIEWED FROM THE POTENTIOMETER SIDE.
 - ▲ POT #2 AXLE: FLAT FACES LEFT WHEN VIEWED FROM THE TOP WITH POT #1 DOWN.
 - ▲ POT #3 AXLE: FLAT FACES TOWARD THE CRUX BASE ASSEMBLY.
- ▲ INSTALL THE THREE ROTARY POTENTIOMETERS (T1CXM014) ONTO THE POT AXLES BY ALIGNING THE FLAT ON THE SHAFT WITH THE FLAT OF THE POTENTIOMETER BORE.
- ▲ ALIGN THE LOCKING POSTS OF THE POTENTIOMETER WITH THE CORRESPONDING HOLES ON THE END OF THE BASE AND SECURE WITH THE POTENTIOMETER RETAINING BRACKET (T1CXM015) AND TWO #2-56 x 1/4" F.H.S.C.S. (5)
- ▲ WARNING: THE PD210-4B POTENTIOMETERS HAVE AN INTERNAL ROTATION STOP WHICH LIMITS THE TOTAL MECHANICAL ROTATION OF THE UNITS TO 318°. CARE MUST BE TAKEN NOT TO FORCE THE UNITS INTO A POSITION WHICH WOULD DAMAGE THIS INTERNAL STOP. THE UNITS ARE DESIGNED TO OPERATE WITHIN THE PROPER RANGE OF MOTION WHEN THEY ARE POSITIONED INTO THEIR RESPECTIVE LOCATIONS WITHIN THE THORAX.
- ▲ ENGRAVE CRUX SERIAL NUMBER: CXUL****, WHERE THE LAST FOUR DIGITS ARE THE NUMBER OF THE CRUX UNIT STARTING AT 0001. THESE LAST FOUR DIGITS WILL BE ASSIGNED TO THE UNITS IN THE ORDER OF ASSEMBLY.

REV. #	ZONE	BY	DESCRIPTION	DATE	BY
1	GLOBAL	J. POLAND	CHANGED ITEM# CALLED OUT AT END OF NOTE 5	6/10/99	J. POLAND
2	GLOBAL	M. ARTS	REPLACED U-JOINT, FLAT WASHER, AND GROMMET;	4/9/01	M. ARTS
3	GLOBAL	K. BEARER	UPDATED U-JOINT DIA TO #0.360 FROM #0.375	10/9/01	K. BEARER
4	GLOBAL	B. SEBCK	UPDATED ASSEM. FROM REDESIGN OF T1CXM210,211,212	10/01/04	B. SEBCK

QTY	DWG/PART NUMBER	DESCRIPTION	MATERIAL
6	MCM # 92210A077	#2-56 x 1/4" F.H.S.C.S. (S.S.)	PURCHASED
4	T1CXM015	POTENTIOMETER RETAINING BRACKET	6061-T6
3	T1CXM014	CRUX ROTARY POTENTIOMETER (MOD)	PLASTIC
2	MCM # 98410A113	1/4" EXTERNAL C-CLIP	PURCHASED
1	T1CXM013	CRUX - JOINT WASHER	1018 CRS
C	T1CXM300	CRUX - ROD #2 ASSEMBLY	
B	T1CXM200	CRUX - ROD #1 ASSEMBLY	
A	T1CXM100	CRUX - BASE ASSEMBLY	

ADDITIONAL HARDWARE NEEDED FOR ASSEMBLY	
ENGINEERED:	DATE: 3/25/06
D. BEACH	
DRAWN:	DATE: 7/11/97
D. BEACH	
CHECKED:	DATE: 7/11/97
D. BEACH	
SCALE	SIZE
1=1	C
REVISION	4
QUANTITY FOR AN ASSEMBLY	1
QUANTITY FOR ENTIRE DUMMY	1
SEE SPECS.	

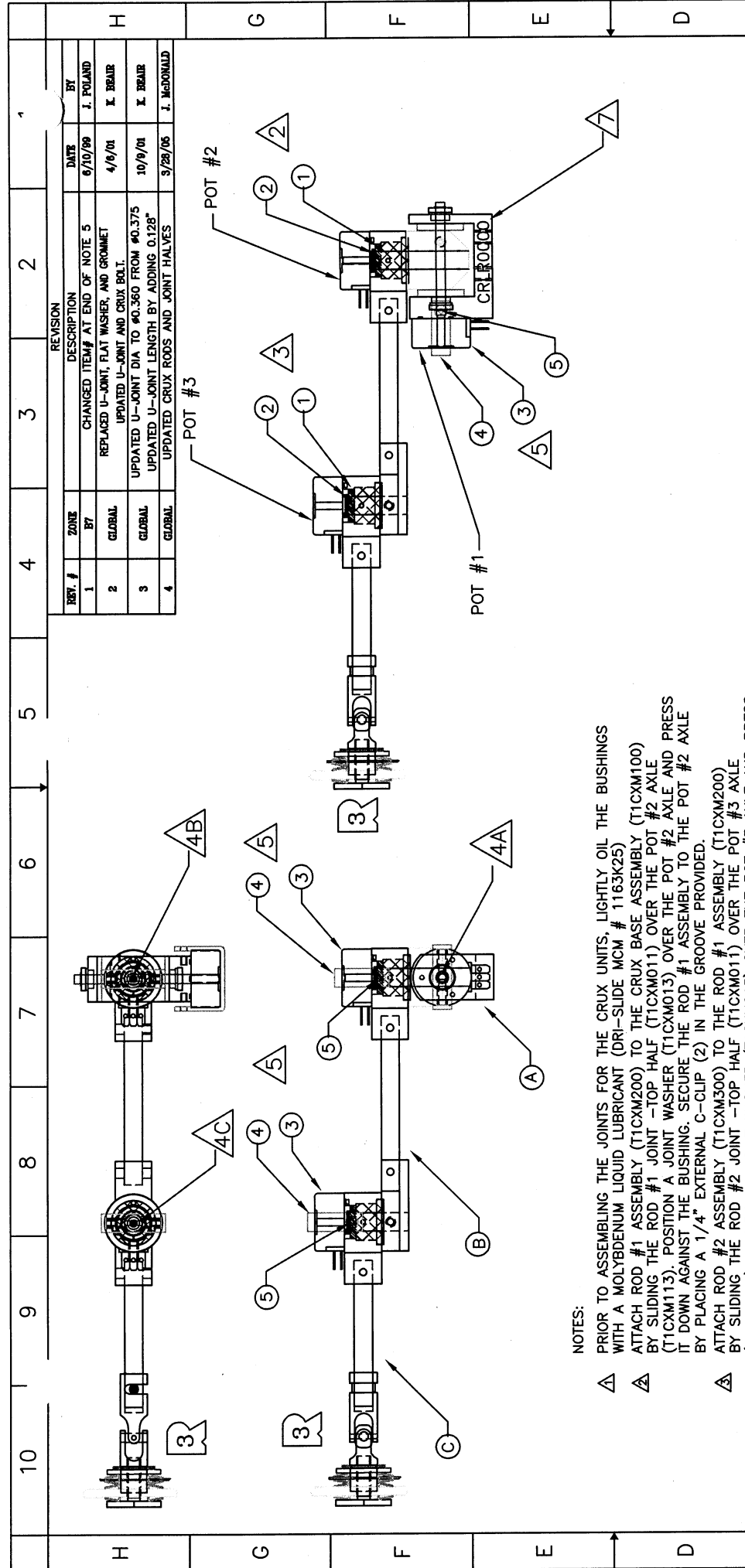
UNLESS OTHERWISE SPECIFIED:
DIMENSIONS ARE IN INCHES
Tolerances
Angles: ± .5°
Fractions: ± 1/64
Decimals: .xx ± .01
.xxx ± .005
Hole Dia. ± .002
* DO NOT SCALE DRAWINGS *

DEPARTMENT OF TRANSPORTATION
NHTSA
CONTRACT NO.: DTNHS 82-84-C-07010
DESIGNED BY: GESAC, INC.
125 ORCHARD DRIVE
BOWERSVILLE, MD 21733

DRAWING TITLE:
CRUX - UPPER LEFT UNIT
MECHANICAL ASSEMBLY

DRAWING NUMBER:
T1CXM002

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1/1



REV. #	ZONE	BY	DESCRIPTION	DATE	BY
1			CHANGED ITEM# AT END OF NOTE 5	6/10/99	J. POLAND
2	GLOBAL		REPLACED U-JOINT, FLAT WASHER, AND GROMMET	4/9/01	K. BEAR
3	GLOBAL		UPDATED U-JOINT DIA TO #0.360 FROM #0.375	10/9/01	K. BEAR
4	GLOBAL		UPDATED U-JOINT LENGTH BY ADDING 0.128"	3/28/05	J. McDONALD

QTY	DTG/PART NUMBER	DESCRIPTION	MATERIAL
5	MCM # 92210A077	#2-56 x 1/4" F.H.S.C.S. (S.S.)	PURCHASED
4	T1CXM015	POTENTIOMETER RETAINING BRACKET	6061-T6
3	T1CXM014	CRUX ROTARY POTENTIOMETER (MOD)	PLASTIC
2	MCM # 98410A113	1/4" EXTERNAL C-CLIP	PURCHASED
1	T1CXM013	CRUX - JOINT WASHER	1018 CRS
C	T1CXM000	CRUX - ROD #2 ASSEMBLY	
B	T1CXM200	CRUX - ROD #1 ASSEMBLY	
A	T1CXM100	CRUX - BASE ASSEMBLY	

UNLESS OTHERWISE SPECIFIED		ADDITIONAL HARDWARE NEEDED FOR ASSEMBLY	
ENGINEERED:	DATE:	ENGINEERED:	DATE:
D. BEACH	3/25/96		
DRAWN:	DATE:		
D. BEACH	7/11/97		
CHECKED:	DATE:		
D. BEACH	7/11/97		
SCALE:	SIZE	REVISION	
1=1	C	4	

DEPARTMENT OF TRANSPORTATION	
NHTSA	
CONTRACT NO.: DTRM 22-94-C-07010	
DESIGNED BY: GESAC, INC.	
125 ORCHARD DRIVE ROCKFORD, IL 61153	
DRAWING TITLE:	CRUX - LOWER RIGHT UNIT
DRAWING NUMBER:	MERCHANICAL ASSEMBLY
QUANTITY FOR AN ASSEMBLY:	1
QUANTITY FOR ENTIRE DUMMY:	1
SEE SPECS.	
MATERIAL:	
DRAWING NUMBER:	T1CXM003
Page	1/1

NOTES:

▲ PRIOR TO ASSEMBLING THE JOINTS FOR THE CRUX UNITS, LIGHTLY OIL THE BUSHINGS WITH A MOLYBDENUM LIQUID LUBRICANT (DRI-SLIDE MCM # 1163K25)

▲ ATTACH ROD #1 ASSEMBLY (T1CXM200) TO THE CRUX BASE ASSEMBLY (T1CXM100) BY SLIDING THE ROD #1 JOINT -TOP HALF (T1CXM011) OVER THE POT #2 AXLE (T1CXM113). POSITION A JOINT WASHER (T1CXM013) OVER THE POT #2 AXLE AND PRESS IT DOWN AGAINST THE BUSHING. SECURE THE ROD #1 ASSEMBLY TO THE POT #2 AXLE BY PLACING A 1/4" EXTERNAL C-CLIP (2) IN THE GROOVE PROVIDED.

▲ ATTACH ROD #2 ASSEMBLY (T1CXM300) TO THE ROD #1 ASSEMBLY (T1CXM200) BY SLIDING THE ROD #2 JOINT -TOP HALF (T1CXM011) OVER THE POT #3 AXLE (T1CXM213). POSITION A JOINT WASHER (T1CXM013) OVER THE POT #3 AXLE AND PRESS IT DOWN AGAINST THE BUSHING. SECURE THE ROD #2 ASSEMBLY TO THE POT #3 AXLE BY PLACING A 1/4" EXTERNAL C-CLIP (2) IN THE GROOVE PROVIDED.

▲ CHECK THE ORIENTATION OF THE FLATS ON THE THREE POT AXLES TO INSURE PROPER OPERATION OF THE CRUX UNIT. FOR THE LOWER RIGHT CRUX UNITS, THE FLATS SHOULD BE ORIENTED AS FOLLOWS - REFER TO VIEW GIVEN BY NOTE:

▲ POT #1 AXLE: FLAT FACES TO THE LEFT WHEN VIEWED FROM THE POTENTIOMETER SIDE.

▲ POT #2 AXLE: FLAT FACES LEFT WHEN VIEWED FROM THE TOP WITH POT #1 DOWN.

▲ POT #3 AXLE: FLAT FACES TOWARD THE CRUX BASE ASSEMBLY.

▲ INSTALL THE THREE ROTARY POTENTIOMETERS (T1CXM014) ONTO THE POT AXLES BY ALIGNING THE FLAT ON THE SHAFT WITH THE FLAT OF THE POTENTIOMETER BORE.

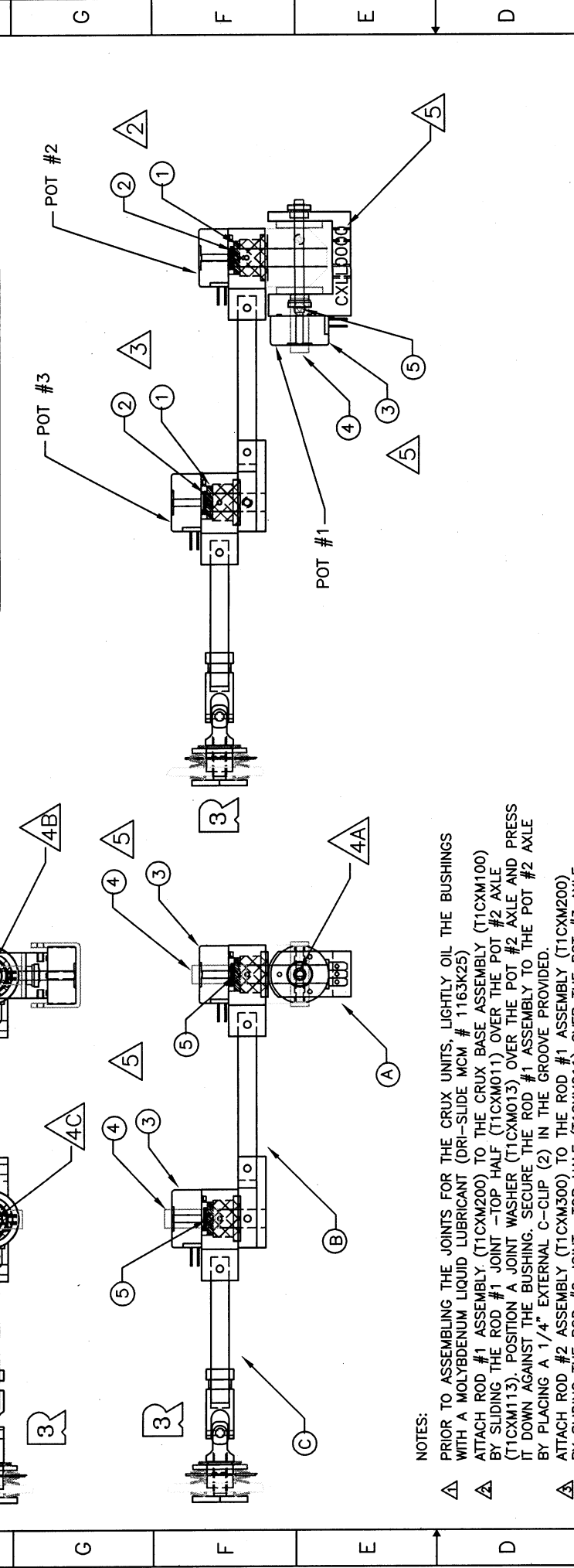
▲ ALIGN THE LOCKING POSTS OF THE POTENTIOMETER WITH THE CORRESPONDING HOLES ON THE END OF THE BASE AND SECURE WITH THE POTENTIOMETER RETAINING BRACKET (T1CXM015) AND TWO #2-56 x 1/4" F.H.S.C.S. (5)

▲ WARNING: THE PD210-4B POTENTIOMETERS HAVE AN INTERNAL ROTATION STOP WHICH LIMITS THE TOTAL MECHANICAL ROTATION OF THE UNITS TO 318°. CARE MUST BE TAKEN NOT TO FORCE THE UNITS INTO A POSITION WHICH WOULD DAMAGE THIS INTERNAL STOP. THE UNITS ARE DESIGNED TO OPERATE WITHIN THE PROPER RANGE OF MOTION WHEN THEY ARE POSITIONED INTO THEIR RESPECTIVE LOCATIONS WITHIN THE THORAX.

▲ ENGRAVE CRUX SERIAL NUMBER: CXLR****, WHERE THE LAST FOUR DIGITS ARE THE NUMBER OF THE CRUX UNIT STARTING AT 0001. THESE LAST FOUR DIGITS WILL BE ASSIGNED TO THE UNITS IN THE ORDER OF ASSEMBLY.

10	9	8	7	6	5	4	3	2	1
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REV. #	ZONE	DESCRIPTION	DATE	BY
1	GLOBAL	CHANGED ITEM# CALLED OUT AT END OF NOTE 5	6/10/96	J. POLAND
2	GLOBAL	REPLACED U-JOINT, FLAT WASHER, AND GROMMET;	4/6/01	K. REAR
3	GLOBAL	UPDATED U-JOINT DIA TO #0.360 FROM #0.375	10/9/01	K. REAR
4	GLOBAL	UPDATED U-JOINT LENGTH BY ADDING 0.128"	3/28/05	J. McDONALD



QTY	DWG/PART NUMBER	DESCRIPTION	MATERIAL
6	MCM # 92210A077	#2-56 x 1/4" F.H.S.C.S. (S.S.)	PURCHASED
4	T1CXM015	POTENTIOMETER RETAINING BRACKET	6061-T6
3	T1CXM014	CRUX ROTARY POTENTIOMETER (MOD)	PLASTIC
2	MCM # 98410A113	1/4" EXTERNAL C-CLIP	PURCHASED
1	T1CXM013	CRUX - JOINT WASHER	1018 CRS
C	T1CXM000	CRUX - ROD #2 ASSEMBLY	
B	T1CXM200	CRUX - ROD #1 ASSEMBLY	
A	T1CXM100	CRUX - BASE ASSEMBLY	

ADDITIONAL HARDWARE NEEDED FOR ASSEMBLY		DESCRIPTION	MATERIAL
UNLESS OTHERWISE SPECIFIED	DATE:	DEPARTMENT OF TRANSPORTATION	
DIMENSIONS ARE IN INCHES	D. BEACH	3/25/96	
Tolerances	DRAWN:		
Angles: ± .5°	D. BEACH	7/11/97	
Fractions: ± 1/64	CHECKED:		
Decimals: .xx ± .01	D. BEACH	7/11/97	
Hole Dia: ± .002	SCALE	SIZE	REVISION
± .001 NOT SCALE DRAWING	1=1	C	4
FINISH:	QUANTITY FOR AN ASSEMBLY		
	1		
MATERIAL:	QUANTITY FOR ENTIRE DUMMY		
SEE SPECS.	1		

NOTES:

▲ PRIOR TO ASSEMBLING THE JOINTS FOR THE CRUX UNITS, LIGHTLY OIL THE BUSHINGS WITH A MOLYBDENUM LIQUID LUBRICANT (DRI-SLIDE MCM # 1163K25)

▲ ATTACH ROD #1 ASSEMBLY (T1CXM200) TO THE CRUX BASE ASSEMBLY (T1CXM100) BY SLIDING THE ROD #1 JOINT -TOP HALF (T1CXM011) OVER THE POT #2 AXLE (T1CXM113). POSITION A JOINT WASHER (T1CXM013) OVER THE POT #2 AXLE AND PRESS IT DOWN AGAINST THE BUSHING. SECURE THE ROD #1 ASSEMBLY TO THE POT #2 AXLE BY PLACING A 1/4" EXTERNAL C-CLIP (2) IN THE GROOVE PROVIDED.

▲ ATTACH ROD #2 ASSEMBLY (T1CXM300) TO THE ROD #1 ASSEMBLY (T1CXM200) BY SLIDING THE ROD #2 JOINT -TOP HALF (T1CXM011) OVER THE POT #3 AXLE (T1CXM213). POSITION A JOINT WASHER (T1CXM013) OVER THE POT #3 AXLE AND PRESS IT DOWN AGAINST THE BUSHING. SECURE THE ROD #2 ASSEMBLY TO THE POT #3 AXLE BY PLACING A 1/4" EXTERNAL C-CLIP (2) IN THE GROOVE PROVIDED.

▲ CHECK THE ORIENTATION OF THE FLATS ON THE THREE POT AXLES TO INSURE PROPER OPERATION OF THE CRUX UNIT. FOR THE LOWER LEFT CRUX UNITS, THE FLATS SHOULD BE ORIENTED AS FOLLOWS - REFER TO VIEW GIVEN BY NOTE:

▲ POT #1 AXLE: FLAT FACES TO THE LEFT WHEN VIEWED FROM THE POTENTIOMETER SIDE.

▲ POT #2 AXLE: FLAT FACES LEFT WHEN VIEWED FROM THE TOP WITH POT #1 DOWN.

▲ POT #3 AXLE: FLAT FACES AWAY FROM THE CRUX BASE ASSEMBLY.

▲ INSTALL THE THREE ROTARY POTENTIOMETERS (T1CXM014) ONTO THE POT AXLES BY ALIGNING THE FLAT ON THE SHAFT WITH THE FLAT OF THE POTENTIOMETER BORE. ALIGN THE LOCKING POSTS OF THE POTENTIOMETER WITH THE CORRESPONDING HOLES ON THE END OF THE BASE AND SECURE WITH THE POTENTIOMETER RETAINING BRACKET (T1CXM015) AND TWO #2-56 x 1/4" F.H.S.C.S. (5)

▲ WARNING: THE PD210-4B POTENTIOMETERS HAVE AN INTERNAL ROTATION STOP WHICH LIMITS THE TOTAL MECHANICAL ROTATION OF THE UNITS TO 318°. CARE MUST BE TAKEN NOT TO FORCE THE UNITS INTO A POSITION WHICH WOULD DAMAGE THIS INTERNAL STOP. THE UNITS ARE DESIGNED TO OPERATE WITHIN THE PROPER RANGE OF MOTION WHEN THEY ARE POSITIONED INTO THEIR RESPECTIVE LOCATIONS WITHIN THE THORAX.

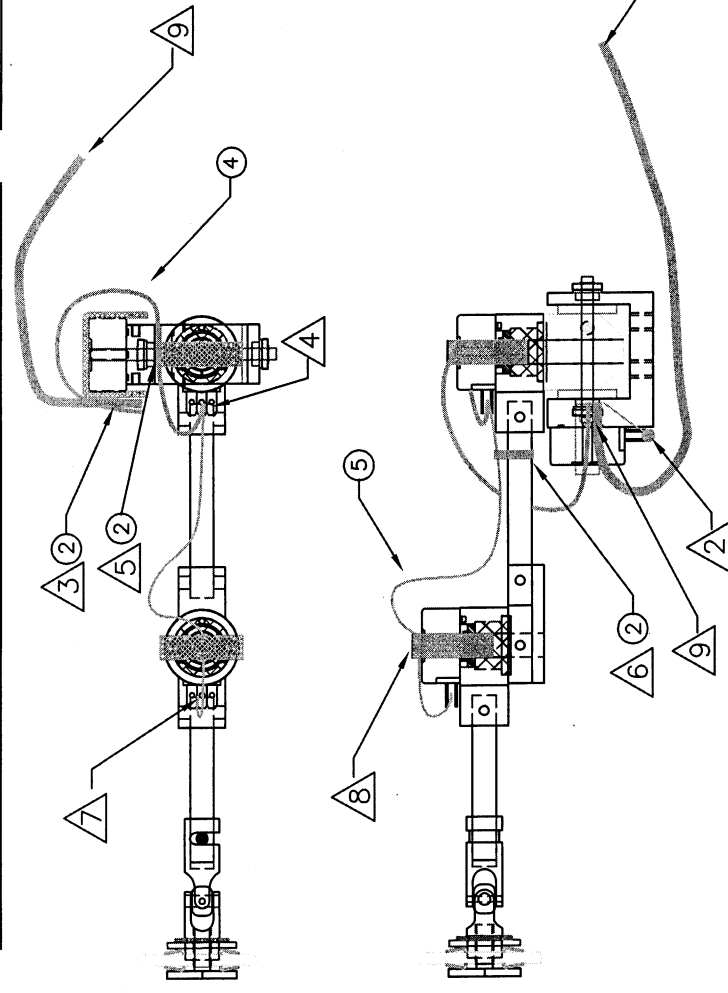
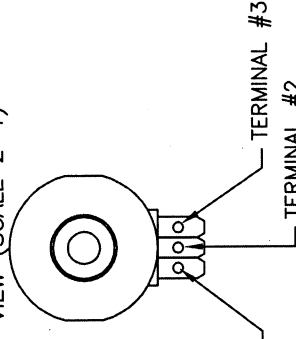
▲ ENGRAVE CRUX SERIAL NUMBER: CXL****, WHERE THE LAST FOUR DIGITS ARE THE NUMBER OF THE CRUX UNIT STARTING AT 0001. THESE LAST FOUR DIGITS WILL BE ASSIGNED TO THE UNITS IN THE ORDER OF ASSEMBLY.

10	9	8	7	6	5	4	3	2	1
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REV. #	ZONE	DESCRIPTION	DATE	BY
1	GLOBAL	REPLACED U-JOINT, FLAT WASHER, AND GROMMET; UPDATED U JOINT AND CRUX BOLT	5/2/01	M. ARTIS
2	GLOBAL	UPDATE U-JOINT DIA. TO #0.360 FROM #0.375	10/9/01	K. BEAR
3	D-9	DELETED NOTE OF CUTTING GRAY WIRE (USED)	1/3/03	C. SPADE
4	GLOBAL	UPDATE ASSEM. FROM REDESIGN OF TCM210,211,212	10/01/04	B. SECK
5	NOTES	EDIT NOTE 6, ITEM 5 AND NOTE 9	3/28/05	J. McDONALD

POT #	TERMINAL #	WIRE COLOR	FUNCTION
1	1	RED	+ EXCITATION
	2	GREEN	+ SIGNAL
	3	BLACK	GROUND
2	1	ORANGE	+ EXCITATION
	2	BLUE	+ SIGNAL
	3	BLACK STRIPE	GROUND
3	1	RED STRIPE	+ EXCITATION
	2	WHITE	+ SIGNAL
	3	GRAY	GROUND

POTENTIOMETER TERMINAL LAYOUT
TOP VIEW (SCALE 2=1)



- ▲ STRIP 12" OF INSULATION OFF ONE END OF THE 12 CONDUCTOR TENSOLITE WIRE. MAKE A HOLE IN THE MESH SHIELD AT THE BASE OF THE STRIPPED AREA AND PULL THE WIRES OUT OF THE HOLE; CUT OFF THE UNUSED WIRES (BROWN, YELLOW, AND VIOLET).
- ▲ TRIM THE EXPOSED RED, BLACK AND GREEN WIRES TO A LENGTH OF 1.25". PLACE A PIECE OF 3/32" x 1/2" HEATSHRINK TUBING ON EACH OF THESE THREE WIRES AND STRIP THE INSULATION BACK 1/4" FROM THE END OF EACH WIRE. SOLDER THE WIRES TO THE APPROPRIATE TERMINALS ON POT #1 (SEE TABLE AND TERMINAL LAYOUT DIAGRAM ABOVE). SLIDE THE HEATSHRINK TUBING UP OVER THE SOLDERED TERMINAL JOINTS AND SHRINK INTO PLACE WITH A HEAT GUN.
- ▲ PASS THE REMAINING SIX WIRES (FOR POTS #2 AND #3) THROUGH THE PIECE OF 3/32" x 5.25" HEATSHRINK TUBING AND POSITION THE EXPOSED END OF THE INSULATED 12 CONDUCTOR WIRE AND THE SIX WIRE SHRINK TUBE BUNDLE PARALLEL TO EACH OTHER AS SHOWN. SECURE THE TWO WIRE BUNDLES TO THE SIDE OF THE POT #1 RETAINING BRACKET WITH A 4" ZIP TIE IN THE GROOVE PROVIDED.
- ▲ TRIM THE ORANGE, BLACK STRIPE AND BLUE WIRES TO A LENGTH OF 1.25" FROM THE FREE END OF THE SHRINK TUBE BUNDLE. PLACE A PIECE OF 3/32" x 1/2" HEATSHRINK TUBING ON EACH OF THESE THREE WIRES AND STRIP THE INSULATION BACK 1/4" FROM THE END OF EACH WIRE. SOLDER THE WIRES TO THE APPROPRIATE TERMINALS ON POT #2 (SEE TABLE AND TERMINAL LAYOUT DIAGRAM ABOVE). SLIDE THE HEATSHRINK TUBING UP OVER THE SOLDERED TERMINAL JOINTS AND SHRINK IN PLACE WITH A HEAT GUN.
- ▲ SECURE THE 3/32" HEATSHRINK TUBE BUNDLE TO THE SIDE OF THE POT #2 RETAINING BRACKET WITH A 4" ZIP TIE.
- ▲ PASS THE REMAINING THREE WIRES (FOR POT #3) THROUGH THE PIECE OF 3/32" x 4.25" HEATSHRINK TUBING. SECURE THE 1/16" TUBING WIRE BUNDLE TO ROD #1 (NEAR POT #2) USING A 4" ZIP TIE AROUND ROD #1.
- ▲ TRIM THE RED STRIPE, GRAY AND WHITE WIRES TO A LENGTH OF 1.25" FROM THE FREE END OF THE SHRINK TUBE BUNDLE. PLACE A PIECE OF 3/32" x 1/2" HEATSHRINK TUBING ON EACH OF THESE THREE WIRES AND STRIP THE INSULATION BACK 1/4" FROM THE END OF EACH WIRE. SOLDER THE WIRES TO THE APPROPRIATE TERMINALS ON POT #3 (SEE TABLE AND TERMINAL LAYOUT DIAGRAM ABOVE). SLIDE THE HEATSHRINK TUBING UP OVER THE SOLDERED TERMINAL JOINTS AND SHRINK IN PLACE WITH A HEAT GUN.
- ▲ SECURE THE 1/16" HEATSHRINK TUBE BUNDLE BY CLAMPING IT UNDER THE CENTER OF THE POT #3 RETAINING BRACKET IN THE RECESSED GROOVE PROVIDED.
- ▲ CUT THE SHIELD WIRE TO APPROXIMATELY 3/4" AND SOLDER ITEM 6 (RING TERMINAL) TO THE END. FASTEN THE RING TERMINAL BETWEEN THE CRUX BASE AND POTENTIOMETER RETAINING BRACKET USING THE EXISTING #2-56 X 1/4" FHSS.

QTY	DWG/PART NUMBER	DESCRIPTION	MATERIAL
6	MCM # 7113R615	14-16 WIRE GAUGE, # 570 SIZE RING TERMINAL	PURCHASED
5	DK # CP332	3/32" Ø x 4.25" HEATSHRINK TUBING	PURCHASED
4	DK # CP332	3/32" Ø x 5.25" HEATSHRINK TUBING	PURCHASED
3	DK # CP332R50ND	3/32" Ø x 1/2" HEATSHRINK TUBING	PURCHASED
2	MCM # 71130X62	4" NYLON CABLE TIE (0.10" WIDE)	PURCHASED
1	DN # 12CONWIRE	12 CONDUCTOR TENSOLITE WIRE	MATERIAL

ADDITIONAL HARDWARE NEEDED FOR ASSEMBLY

UNLESS OTHERWISE SPECIFIED: ENGINEERED: D. BEACH DATE: 3/25/06
DIMENSIONS ARE IN INCHES

DESIGNED BY: NHTSA
CONTRACT NO.: DTN8 22-94-C-07010
DESIGNED BY: CERSAC, INC.
125 ORCHARD DRIVE
ROCKFORD, IL 61103

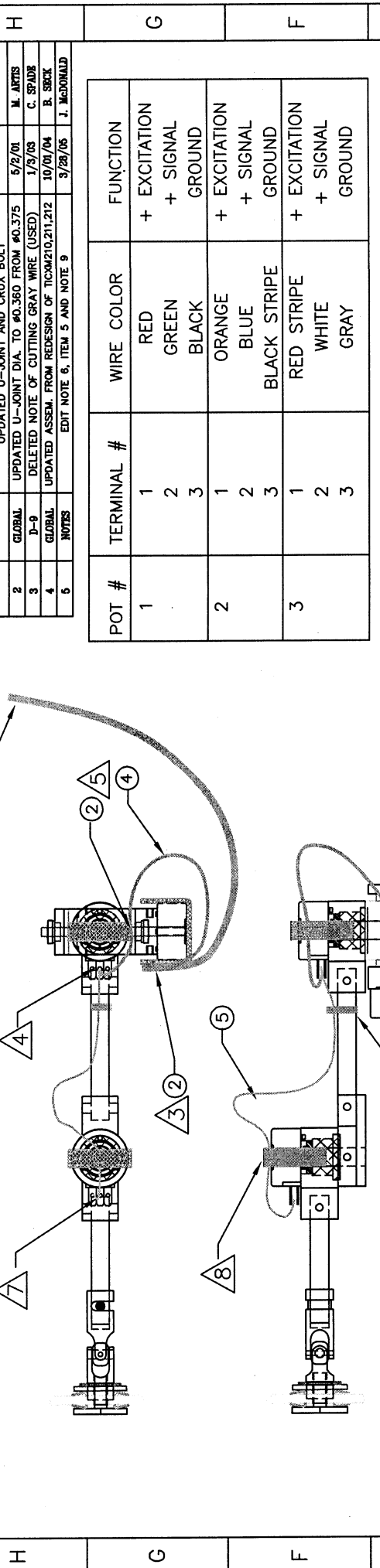
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QUANTITY FOR AN ASSEMBLY: 1

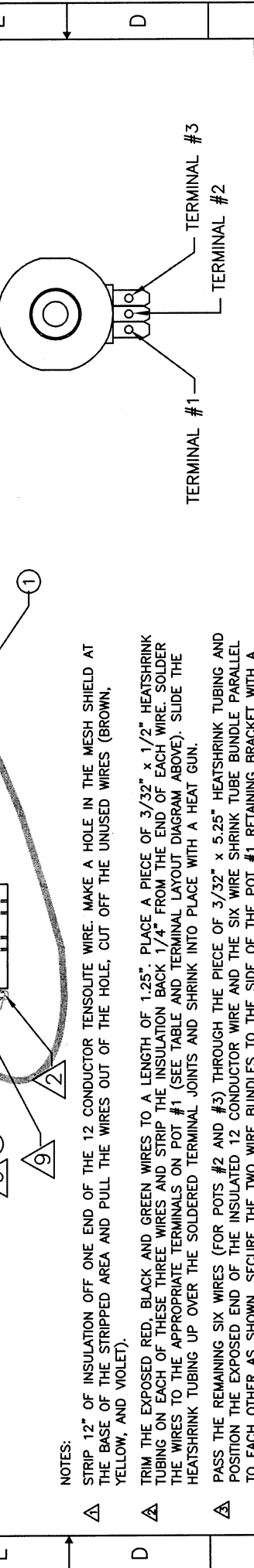
QUANTITY FOR ENTIRE DUMMY: 1

DRAWING NUMBER: T1CXE001

Page: 1/1



POTENTIOMETER TERMINAL LAYOUT
TOP VIEW (SCALE 2=1)



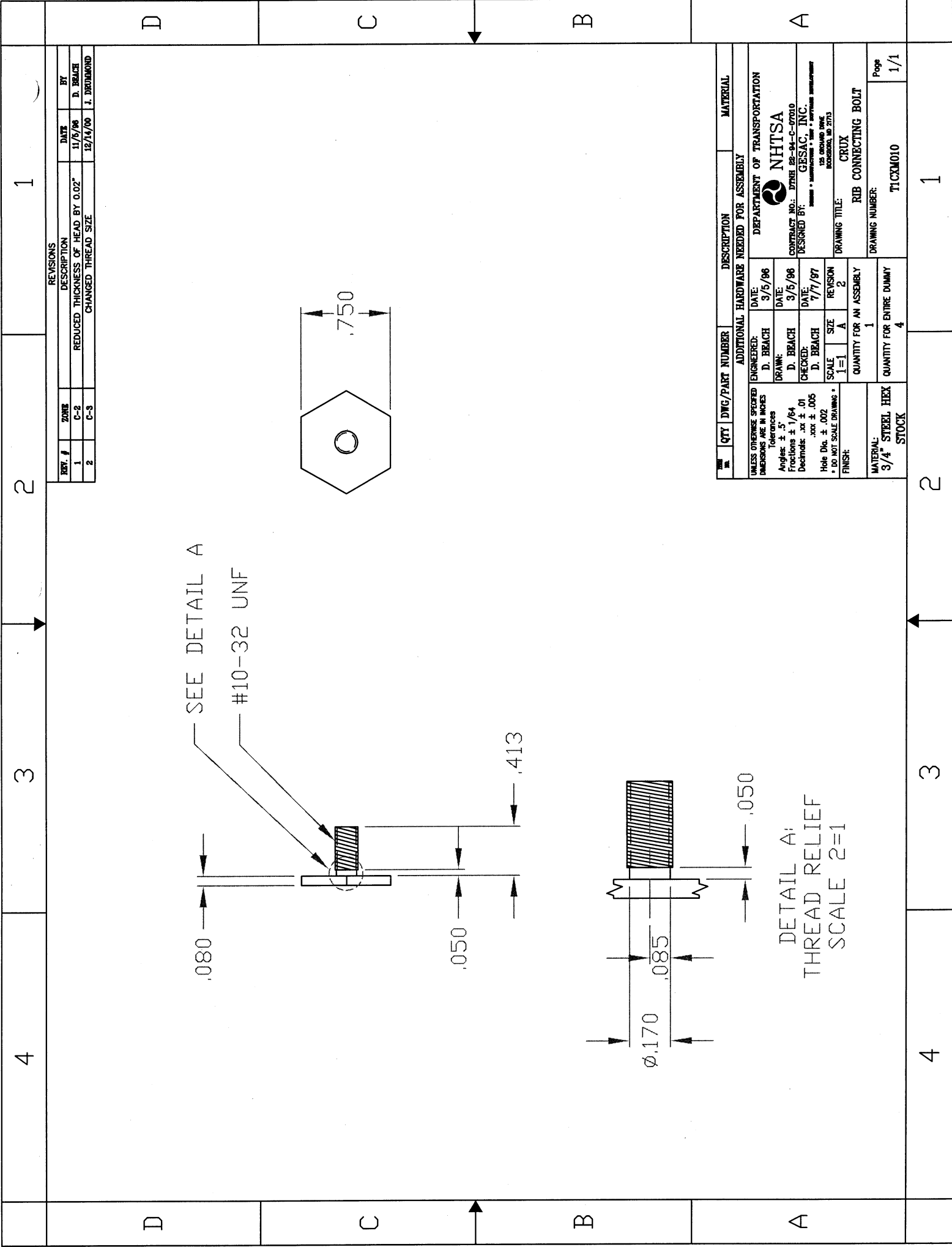
REV. #	ZONE	DESCRIPTION	DATE	BY
1	GLOBAL	REPLACED U-JOINT, FLAT WASHER, AND GROMMET;	5/2/01	M. ARTS
2	GLOBAL	UPDATED U-JOINT AND CRUX BOLT	5/2/01	M. ARTS
3	D-9	UPDATED U-JOINT DIA. TO #0.360 FROM #0.375	1/9/03	C. SPADE
4	GLOBAL	DELETED NOTE OF CUTTING GRAY WIRE (USED)	10/01/04	B. SROCK
5	NOTES	UPDATED ASSEM. FROM REDESIGN OF TICAM210,211,212	3/28/05	J. McDONALD
		EDIT NOTE 6, ITEM 5 AND NOTE 9		

POT #	TERMINAL #	WIRE COLOR	FUNCTION
1	1	RED	+ EXCITATION
	2	GREEN	+ SIGNAL
	3	BLACK	GROUND
2	1	ORANGE	+ EXCITATION
	2	BLUE	+ SIGNAL
	3	BLACK STRIPE	GROUND
3	1	RED STRIPE	+ EXCITATION
	2	WHITE	+ SIGNAL
	3	GRAY	GROUND

QTY	QTY	DWG/PART NUMBER	DESCRIPTION	MATERIAL
6	1	MCM # 7113XB15	14-16 WIRE GAUGE, # STD SEE LONG TERMINAL	PURCHASED
5	1	DK # CP332	3/32" ϕ x 4.25" HEATSHRINK TUBE	PURCHASED
4	1	DK # CP332	3/32" ϕ x 5.25" HEATSHRINK TUBE	PURCHASED
3	9	DK # CP332R50ND	3/32" ϕ x 1 1/2" HEATSHRINK TUBING	PURCHASED
2	3	MCM # 7130K52	4" NYLON CABLE TIE (0.10" WIDE)	PURCHASED
1	15'	DN # 12CONWIRE	12 CONDUCTOR TENSOLITE WIRE	MATERIAL

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES	DATE:	DEPARTMENT OF TRANSPORTATION
Tolerances	9/25/06	 NHTSA CONTRACT NO.: DOT/EL 22-04-G-07010 DESIGNED BY: GESAC, INC. 155 BRIDGE BLVD. BOULDER, CO 80503
Angles: \pm 5'	D. BEACH	
Fractions: \pm 1/64	D. BEACH	
Decimals: .xxx \pm .005	D. BEACH	
Hole Dia. \pm .002	SCALE	REVISION
* DO NOT SCALE DRAWING *	1=1	C
FINISH:	QUANTITY FOR AN ASSEMBLY	5
	1	
MATERIAL:	QUANTITY FOR ENTIRE DUMMY	1
SEE SPECS.	1	

- NOTES:
- ▲ STRIP 12" OF INSULATION OFF ONE END OF THE 12 CONDUCTOR TENSOLITE WIRE. MAKE A HOLE IN THE MESH SHIELD AT THE BASE OF THE STRIPPED AREA AND PULL THE WIRES OUT OF THE HOLE, CUT OFF THE UNUSED WIRES (BROWN, YELLOW, AND VIOLET).
 - ▲ TRIM THE EXPOSED RED, BLACK AND GREEN WIRES TO A LENGTH OF 1.25". PLACE A PIECE OF 3/32" x 1/2" HEATSHRINK TUBING ON EACH OF THESE THREE WIRES AND STRIP THE INSULATION BACK 1/4" FROM THE END OF EACH WIRE. SOLDER THE WIRES TO THE APPROPRIATE TERMINALS ON POT #1 (SEE TABLE AND TERMINAL LAYOUT DIAGRAM ABOVE). SLIDE THE HEATSHRINK TUBING UP OVER THE SOLDERED TERMINAL JOINTS AND SHRINK INTO PLACE WITH A HEAT GUN.
 - ▲ PASS THE REMAINING SIX WIRES (FOR POTS #2 AND #3) THROUGH THE PIECE OF 3/32" x 5.25" HEATSHRINK TUBING AND POSITION THE EXPOSED END OF THE INSULATED 12 CONDUCTOR WIRE AND THE SIX WIRE SHRINK TUBE BUNDLE PARALLEL TO EACH OTHER, AS SHOWN. SECURE THE TWO WIRE BUNDLES TO THE SIDE OF THE POT #1 RETAINING BRACKET WITH A 4" ZIP TIE IN THE GROOVE PROVIDED.
 - ▲ TRIM THE ORANGE, BLACK STRIPE AND BLUE WIRES TO A LENGTH OF 1.25" FROM THE FREE END OF THE SHRINK TUBE BUNDLE. PLACE A PIECE OF 3/32" x 1/2" HEATSHRINK TUBING ON EACH OF THESE THREE WIRES AND STRIP THE INSULATION BACK 1/4" FROM THE END OF EACH WIRE. SOLDER THE WIRES TO THE APPROPRIATE TERMINALS ON POT #2 (SEE TABLE AND TERMINAL LAYOUT DIAGRAM ABOVE). SLIDE THE HEATSHRINK TUBING UP OVER THE SOLDERED TERMINAL JOINTS AND SHRINK IN PLACE WITH A HEAT GUN.
 - ▲ SECURE THE 3/32" HEATSHRINK TUBE BUNDLE TO THE SIDE OF THE POT #2 RETAINING BRACKET WITH A 4" ZIP TIE.
 - ▲ PASS THE REMAINING THREE WIRES (FOR POT #3) THROUGH THE PIECE OF 3/32" x 4.25" HEATSHRINK TUBING. SECURE THE 1/16" TUBING WIRE BUNDLE TO ROD #1 (NEAR POT #2) USING A 4" ZIP TIE AROUND ROD #1.
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 - ▲ SECURE THE 1/16" HEATSHRINK TUBE BUNDLE BY CLAMPING IT UNDER THE CENTER OF THE POT #3 RETAINING BRACKET IN THE RECESSED GROOVE PROVIDED.
 - ▲ CUT THE SHIELD WIRE TO APPROXIMATELY 3/4" AND SOLDER ITEM 6 (RING TERMINAL) TO THE END. FASTEN THE RING TERMINAL BETWEEN THE CRUX BASE AND POTENTIOMETER RETAINING BRACKET USING THE EXISTING #2-56 X 1/4" FHSCS.



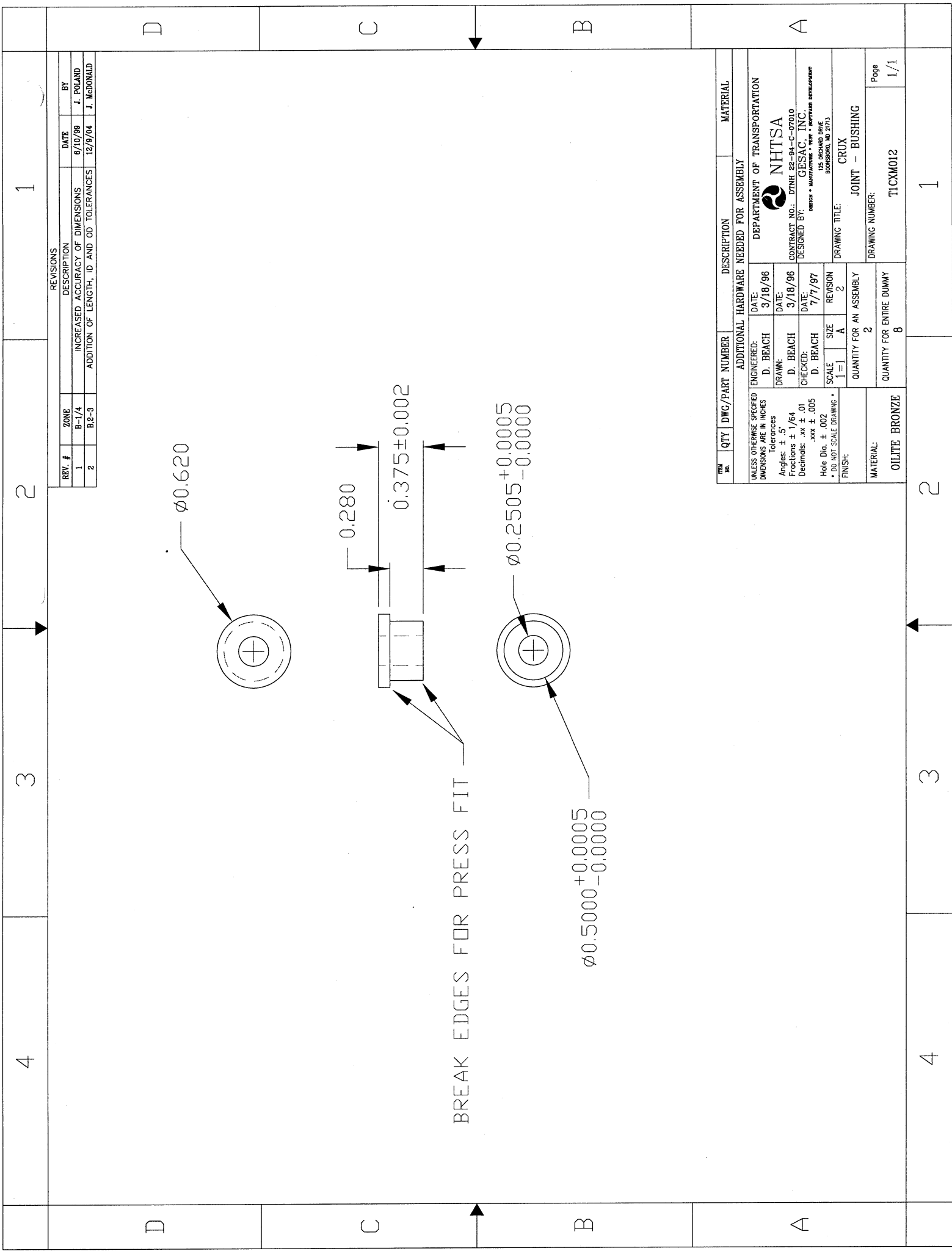
REVISIONS

REV. #	ZONE	DESCRIPTION	DATE	BY
1	C-2	REDUCED THICKNESS OF HEAD BY 0.02"	11/5/96	D. BEACH
2	C-3	CHANGED THREAD SIZE	12/14/00	J. DROMMOND

QTY	DWG/PART NUMBER	DESCRIPTION	MATERIAL
1		ADDITIONAL HARDWARE NEEDED FOR ASSEMBLY	
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES		ENGINEERED: D. BEACH	DATE: 3/5/96
Tolerances		DRAWN: D. BEACH	DATE: 3/5/96
Angles ± .5°		CHECKED: D. BEACH	DATE: 7/7/97
Fractions ± 1/64		SCALE: 1=1	REVISION: 2
Decimals: .xx ± .01		QUANTITY FOR AN ASSEMBLY: 1	
.xxx ± .005		QUANTITY FOR ENTIRE DUMMY: 4	
Hole Dia. ± .002			
* DO NOT SCALE DRAWING *			
FINISH:			
MATERIAL: 3/4" STEEL HEX STOCK			
DEPARTMENT OF TRANSPORTATION			
NHTSA			
CONTRACT NO.: DTRH 22-94-C-07010			
DESIGNED BY: GESAC, INC.			
125 GROUND LANE			
ROCKVILLE, MD 20850			
DRAWING TITLE: CRUX			
RIB CONNECTING BOLT			
DRAWING NUMBER: TICXM010			
Page: 1/1			

DETAIL A:
 THREAD RELIEF
 SCALE 2=1

8	7	6	5	4	3	2	1																																				
<p style="text-align: center;">REVISIONS</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>REV. #</th> <th>ZONE</th> <th>DESCRIPTION</th> <th>DATE</th> <th>BY</th> </tr> </thead> <tbody> <tr> <td>00</td> <td>GLOBAL</td> <td>EXEMPT SHFT CONNECTION FROM THREAD AND SET BORE TO HLL PH</td> <td>9/19/04</td> <td>B. BRICK</td> </tr> <tr> <td>01</td> <td>5,8 & C</td> <td>ADD TOLERANCE TO MACHINED HOLES AND C'BORE</td> <td>12/0/04</td> <td>J. DONALD</td> </tr> </tbody> </table>								REV. #	ZONE	DESCRIPTION	DATE	BY	00	GLOBAL	EXEMPT SHFT CONNECTION FROM THREAD AND SET BORE TO HLL PH	9/19/04	B. BRICK	01	5,8 & C	ADD TOLERANCE TO MACHINED HOLES AND C'BORE	12/0/04	J. DONALD																					
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01	5,8 & C	ADD TOLERANCE TO MACHINED HOLES AND C'BORE	12/0/04	J. DONALD																																							
<p>NOTES:</p> <p>1 THE THREE #53 WIRE DRILL HOLES WERE OMITTED IN THIS VIEW FOR CLARITY.</p> <p>2 MACHINE FLATS ON SIDE FOR A TOTAL WIDTH OF 0.760"</p>																																											
<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>QTY</th> <th>DTG/PART NUMBER</th> <th>DESCRIPTION</th> <th>MATERIAL</th> </tr> </thead> <tbody> <tr> <td colspan="4">ADDITIONAL HARDWARE NEEDED FOR ASSEMBLY</td> </tr> <tr> <td colspan="2">ENGINEERED: D. BEACH</td> <td>DATE: 3/19/06</td> <td>DEPARTMENT OF TRANSPORTATION</td> </tr> <tr> <td colspan="2">DRAWN: D. BEACH</td> <td>DATE: 3/19/06</td> <td>NHTSA</td> </tr> <tr> <td colspan="2">CHECKED: J. DONALD</td> <td>DATE: 7/7/07</td> <td>CONTRACT NO.: DTMB 28-04-C-07010</td> </tr> <tr> <td colspan="2">SCALE: 1=1</td> <td>REVISION: B1</td> <td>DESIGNED BY: GESAC, INC.</td> </tr> <tr> <td colspan="2">FINISH: *</td> <td>QUANTITY FOR AN ASSEMBLY: 2</td> <td>DRAWING TITLE: CRUX</td> </tr> <tr> <td colspan="2">MATERIAL: 6061-T6</td> <td>QUANTITY FOR ENTIRE DUMMY: 8</td> <td>DRAWING NUMBER: T1CXM011</td> </tr> <tr> <td colspan="2"></td> <td>Page: 1/1</td> <td></td> </tr> </tbody> </table>								QTY	DTG/PART NUMBER	DESCRIPTION	MATERIAL	ADDITIONAL HARDWARE NEEDED FOR ASSEMBLY				ENGINEERED: D. BEACH		DATE: 3/19/06	DEPARTMENT OF TRANSPORTATION	DRAWN: D. BEACH		DATE: 3/19/06	NHTSA	CHECKED: J. DONALD		DATE: 7/7/07	CONTRACT NO.: DTMB 28-04-C-07010	SCALE: 1=1		REVISION: B1	DESIGNED BY: GESAC, INC.	FINISH: *		QUANTITY FOR AN ASSEMBLY: 2	DRAWING TITLE: CRUX	MATERIAL: 6061-T6		QUANTITY FOR ENTIRE DUMMY: 8	DRAWING NUMBER: T1CXM011			Page: 1/1	
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DRAWN: D. BEACH		DATE: 3/19/06	NHTSA																																								
CHECKED: J. DONALD		DATE: 7/7/07	CONTRACT NO.: DTMB 28-04-C-07010																																								
SCALE: 1=1		REVISION: B1	DESIGNED BY: GESAC, INC.																																								
FINISH: *		QUANTITY FOR AN ASSEMBLY: 2	DRAWING TITLE: CRUX																																								
MATERIAL: 6061-T6		QUANTITY FOR ENTIRE DUMMY: 8	DRAWING NUMBER: T1CXM011																																								
		Page: 1/1																																									



REVISIONS				
REV. #	ZONE	DESCRIPTION	DATE	BY
1	B-1/4	INCREASED ACCURACY OF DIMENSIONS	6/10/99	J. POLAND
2	B2-3	ADDITION OF LENGTH, ID AND OD TOLERANCES	12/9/04	J. McDONALD

ITEM NO.	QTY	DWG/PART NUMBER	DESCRIPTION	MATERIAL
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES				
Tolerances				
Angles: ± .5				
Fractions: ± 1/64				
Decimals: .xx ± .01				
.xxx ± .005				
Hole Dia. ± .002				
• DO NOT SCALE DRAWING •				
FINISH:				
ENGINEERED: D. BEACH DATE: 3/18/96				
DRAWN: D. BEACH DATE: 3/18/96				
CHECKED: D. BEACH DATE: 7/7/97				
SCALE: 1=1 SIZE: A REVISION: 2				
QUANTITY FOR AN ASSEMBLY: 2				
QUANTITY FOR ENTIRE DUMMY: 8				
MATERIAL: OILITE BRONZE				
DRAWING TITLE: JOINT - BUSHING				
DRAWING NUMBER: TICXM012				
Page 1/1				


 DEPARTMENT OF TRANSPORTATION
 CONTRACT NO.: DTNH 22-94-C-07010
 DESIGNED BY: GESAC, INC.
GENERAL • AUTOMOTIVE SYSTEMS DIVISION
 125 BECHLER PARK
 BOONSHORE, MD 21013

4

3

2

1

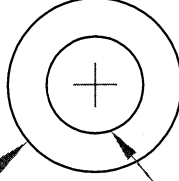
D

C

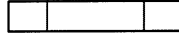
B

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$\varnothing 0.45^{+0.00}_{-0.01}$



LETTER F THRU



$0.0780^{+0.0000}_{-0.0050}$

REVISIONS				
REV. #	ZONE	DESCRIPTION	DATE	BY
1	B-2	ADDED DIMENSIONAL TOLERANCE	6/11/99	D. BEACH
2	D-4	ADDED GEOMETRIC TOLERANCE TO OD	9/14/04	R. SBCK

QTY	DWG/PART NUMBER	DESCRIPTION	MATERIAL
		ADDITIONAL HARDWARE NEEDED FOR ASSEMBLY	
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES			
ENGINEERED:		DATE: 3/16/96	
D. BEACH		DEPARTMENT OF TRANSPORTATION	
DRAWN:		NHTSA	
D. BEACH		CONTRACT NO.: DTMB 22-94-C-07010	
CHECKED:		DESIGNED BY: GESAC, INC.	
D. BEACH		125 ORCHARD WALK	
SCALE: 2=1		ROCKFORD, IL 61173	
SIZE: A		DRAWING TITLE: CRUX	
REVISION: 2		QUANTITY FOR AN ASSEMBLY: 2	
FINISH: *		QUANTITY FOR ENTIRE DUMMY: 8	
MATERIAL: 1018 CRS		DRAWING NUMBER: T1CXM013	
		Page 1/1	

4

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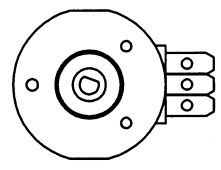
1

4 3 2 1

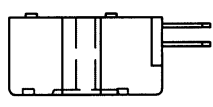
REV. #	ZONE	DESCRIPTION	DATE	BY
1	1	UPDATED POTENTIOMETER DESCRIPTION	5/11/99	D. BEACH

NOTES:
 1 MACHINE FLATS ON SIDES OF POT FOR TOTAL WIDTH OF 0.765"

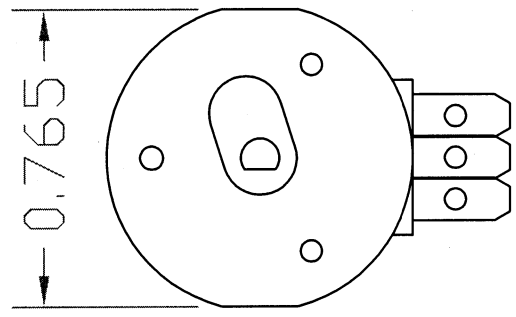
FRONT



RIGHT



REAR (2X)



0.765

D

C

B

A

1	1	TINM210	ROARY POT (0.4% LINEARITY)	PLASTIC
QTY	DWG/PART NUMBER	DESCRIPTION	MATERIAL	
1		ADDITIONAL HARDWARE NEEDED FOR ASSEMBLY		
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES		ENGINEERED:	DATE:	DEPARTMENT OF TRANSPORTATION
Tolerances		D. BEACH	3/5/98	NHTSA
Angles: ± .5°		J. FULLERTON	12/8/95	CONTRACT NO.: DTRRL 22-94-C-07010
Fractions: ± 1/64		CHECKED:	DATE:	DESIGNED BY: GESAC, INC.
Decimals: .xx ± .01		D. BEACH	7/7/97	125 RICHARD AVE
Hole Dia. ± .002		SCALE	SIZE	REVISION
* DO NOT SCALE DRAWING *		1=1	A	1
FINISH:		DRAWING TITLE: CRUX		
MATERIAL: PLASTIC		ROTARY POTENTIOMETER (MODIFIED)		
QUANTITY FOR AN ASSEMBLY		DRAWING NUMBER: T1CXN014		
3		Page 1/1		
QUANTITY FOR ENTIRE DUMMY				
12				

4 3 2 1

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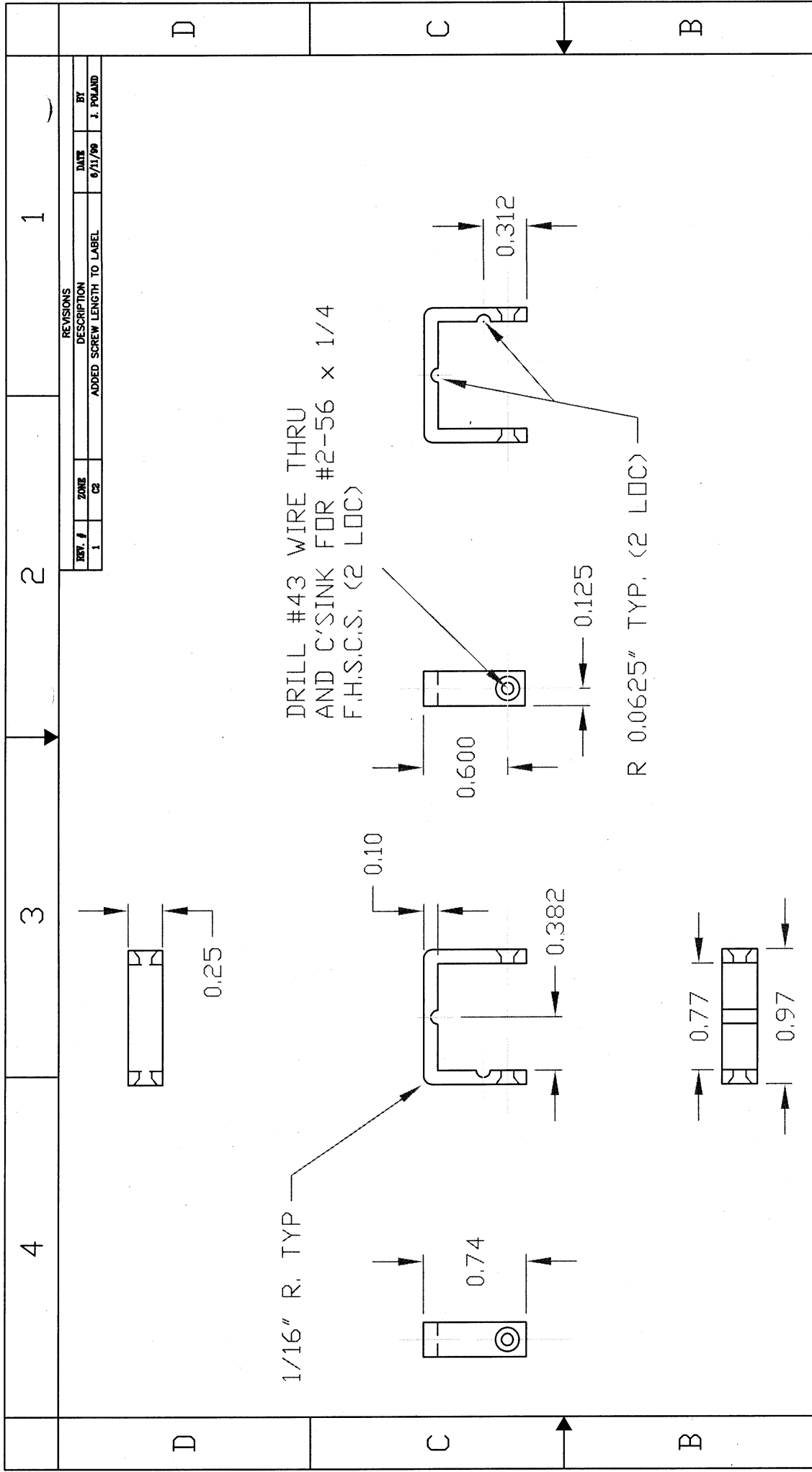
1

D

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NOTES:

- 1 MACHINE PART FROM 6061-T6 ALUMINUM BAR STOCK.
- 2 INTERIOR DIMENSIONS MUST BE MAINTAINED AS CLOSE AS POSSIBLE.
- 3 INTERIOR CORNERS MUST BE SQUARED OFF.

QTY	DWG/PART NUMBER	DESCRIPTION	MATERIAL
ADDITIONAL HARDWARE NEEDED FOR ASSEMBLY			
ENGINEERED:	D. BRACH	DATE: 3/15/96	DEPARTMENT OF TRANSPORTATION
DRAWN:	D. BRACH	DATE: 3/15/96	NHTSA
CHECKED:	D. BRACH	DATE: 7/7/97	CONTRACT NO.: DTMB 22-94-C-07010
SCALE	1=1	REVISION	DESIGNED BY: GRSAC, INC
QUANTITY FOR AN ASSEMBLY	3	DRAWING TITLE	125 ORLAND DRIVE ROCKFORD, IL 61153
QUANTITY FOR ENTIRE DUMMY	12	POTENTIOMETER RETAINING BRACKET	CRUX
MATERIAL:	6061-T6	DRAWING NUMBER:	T1CXM015
		Page	1/1

REV. #	ZONE	DESCRIPTION	DATE	BY
1	C2	ADDED SCREW LENGTH TO LABEL	6/11/99	J. POLAND

DRILL #43 WIRE THRU AND C'SINK FOR #2-56 x 1/4 F.H.S.C.S. (2 LOC)

R 0.0625" TYP. (2 LOC)

10	9	8	7	6	5	4	3	2	1
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REV. #	ZONE	DESCRIPTION	DATE	BY
1	C-4	CHANGED WASHER PART NUMBER	2/18/99	D. BEACH
2	PARTS LIST	CHANGED ITEM# 7	2/18/99	D. BEACH
3	PARTS LIST	MODIFIED WASHER SIZE	9/17/04	R. SROCK

REVISION	
DESCRIPTION	DATE
CHANGED WASHER PART NUMBER	2/18/99
CHANGED ITEM# 7	2/18/99
MODIFIED WASHER SIZE	9/17/04

H	
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G	
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F	
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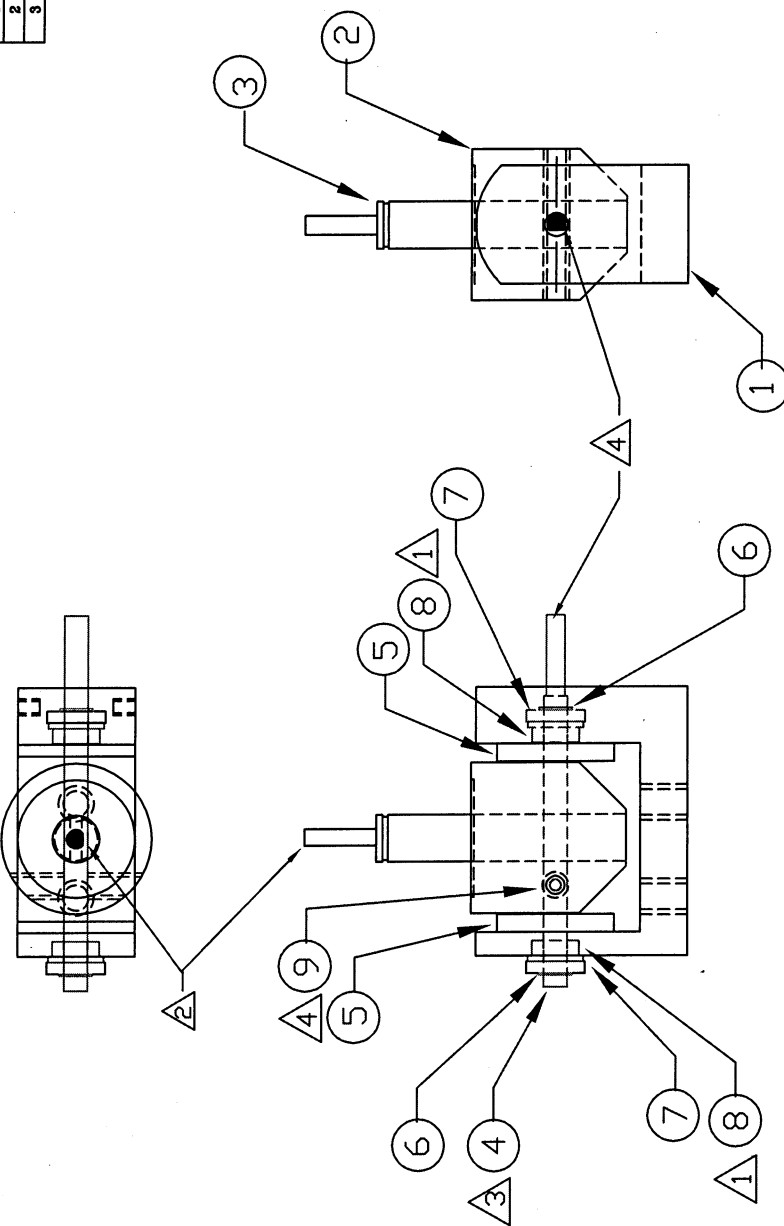
E	
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D	
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C	
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B	
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9	2	TICXM115	POT #1 AXLE - SET SCREW	ALLOY STEEL
8	2	MCM # 57155K144	1/8" BORE MINIATURE BALL BEARING	PURCHASED
7	2	MCM # 98370A005	FINISHED WASHER (DI=1/8" ODI=1/4" THK 1/16")	PURCHASED
6	2	MCM #98410A111	1/8" Ø EXTERNAL C-CLIP (STEEL)	PURCHASED
5	2	TICXM114	BASE ROTATION WASHERS	DELRIN/TEFLON
4	1	TICXM112	POT #1 AXLE	1018 CRS
3	1	TICXM113	POT #2 AXLE	1018 CRS
2	1	TICXM111	POT #2 JOINT - BOTTOM HALF	6061-T6
1	1	TICXM110	CRUX BASE	6061-T6
QTY	DWG/PART NUMBER	DESCRIPTION		
		MATERIAL		

ADDITIONAL HARDWARE NEEDED FOR ASSEMBLY	
ENGINEERED:	DATE: 3/5/98
D. BEACH	
DRAWN:	DATE: 3/5/98
D. BEACH	
CHECKED:	DATE: 7/7/97
D. BEACH	
SCALE	SIZE
2=1	C
REVISION	3
QUANTITY FOR AN ASSEMBLY	1
QUANTITY FOR ENTIRE DUMMY	4
MATERIAL:	SEE SPECS.
FINISH:	
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES	
Tolerances	
Angles: ± .5°	
Fractions: ± 1/64	
Decimals: .xx ± .01	
Decimals: .xxx ± .005	
Hole Dia. ± .002	
* DO NOT SCALE DRAWING *	
DEPARTMENT OF TRANSPORTATION	
NHTSA	
CONTRACT NO.: DOTN 22-94-C-07010	
DESIGNED BY: GESAC INC.	
125 DECHARD DRIVE	
ROCKSBORO, MD 2713	
DRAWING TITLE: CRUX	
BASE - MECHANICAL ASSEMBLY	
DRAWING NUMBER: TICXM100	
Page 1/1	

NOTES:

ASSEMBLE 1/8" BORE MINIATURE BEARINGS (8) ONTO CRUX BASE (TICXM110) WITH THE FLANGES TOWARD THE OUTSIDE.

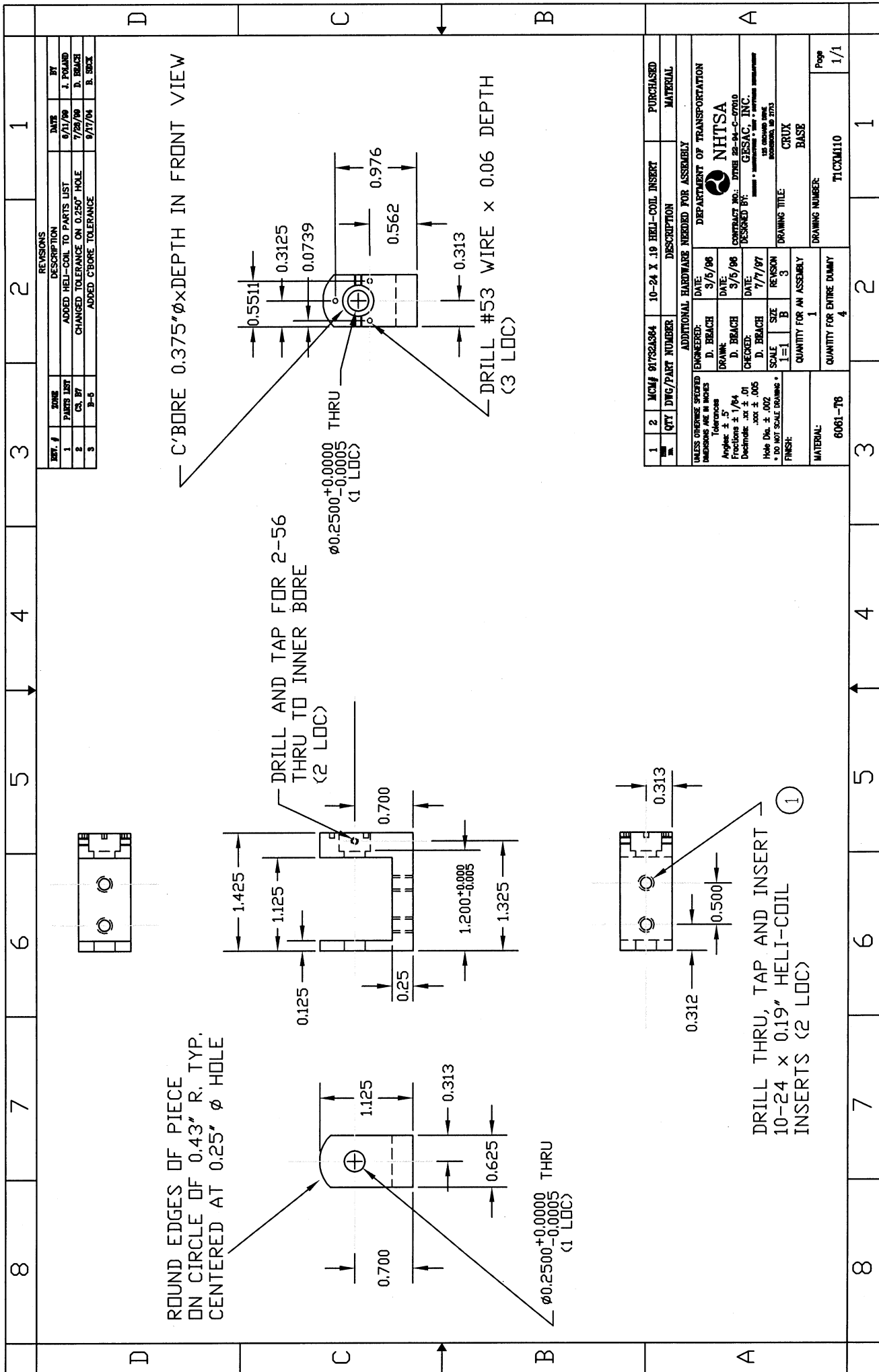
ASSEMBLE POT #2 AXLE (TICXM113) INTO THE POT #2 JOINT - BOTTOM HALF (TICXM111) WITH THE ORIENTATION OF THE FLAT ON THE POT #2 AXLE IS FACING DOWN IN THE TOP VIEW AND FORWARD IN THE SIDE VIEW AS SHOWN.

ASSEMBLE POT #2 JOINT - BOTTOM HALF (TICXM111) ONTO THE BASE (TICXM110) BY SLIDING TICXM112 THRU THE BEARING ON THE LEFT SIDE OF TICXM110, THRU ONE TICXM114, THRU TICXM111, THRU ONE TICXM114, AND THRU THE BEARING ON THE RIGHT SIDE OF TICXM110 AS SHOWN IN THE SIDE VIEW.

SECURE THE TICXM111 TO THE POT #1 AXLE (TICXM112) USING TWO SET SCREWS (TICXM115) IN THE TAPPED HOLES ON TICXM111. THE SET SCREWS MUST ENGAGE THE HOLES IN THE AXLE. LOCTITE 242 THREADLOCKER IS USED TO SECURE THE SET-SCREWS IN PLACE. THE ORIENTATION OF THE FLAT AT THE END OF THE AXLE IS FORWARD IN THE SIDE VIEW AND TO THE LEFT IN THE END VIEW AS SHOWN.

SECURE THE POT #1 AXLE (TICXM112) IN PLACE BY INSTALLING A FINISHED WASHER (7) AND A 1/8"Ø EXTERNAL C-CLIP (6) ONTO EACH END OF THE AXLE.

10	9	8	7	6	5	4	3	2	1
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REVISIONS			
SER. #	DATE	DESCRIPTION	BY
1	6/1/08	ADDED HELI-COIL TO PARTS LIST	J. POLARD
2	7/29/08	CHANGED TOLERANCE ON 0.250" HOLE	D. BRACH
3	9/17/04	ADDED C-BORE TOLERANCE	R. BRICK

MCM# 91752A364		10-24 X .19 HELI-COIL INSERT		PURCHASED	
QTY	DWG/PART NUMBER	DESCRIPTION	MATERIAL	QTY	DWG/PART NUMBER
1	2	10-24 X .19 HELI-COIL INSERT		1	1

ADDITIONAL HARDWARE NEEDED FOR ASSEMBLY			
ENGINEERED:	DATE:	DEPARTMENT OF TRANSPORTATION	
D. BRACH	3/5/08	NHTSA	
DRAWN:	DATE:	CONTRACT NO.: DTMB 04-3-0-0700	
D. BRACH	3/5/08	DESIGNED BY: GERRIT J. VAN DER WERF	
CHECKED:	DATE:	DESIGNED BY: GERRIT J. VAN DER WERF	
D. BRACH	7/7/07	DESIGNED BY: GERRIT J. VAN DER WERF	
SCALE:	SIZE:	DRAWING TITLE: CRUX BASE	
1=1	B	DRAWING NUMBER: 71CKM110	
QUANTITY FOR AN ASSEMBLY:		QUANTITY FOR ENTIRE DUMMY:	
1		4	
MATERIAL:		Page	
6061-76		1/1	

C-BORE 0.375" ϕ x DEPTH IN FRONT VIEW

DRILL #53 WIRE x 0.06 DEPTH (3 LOC)

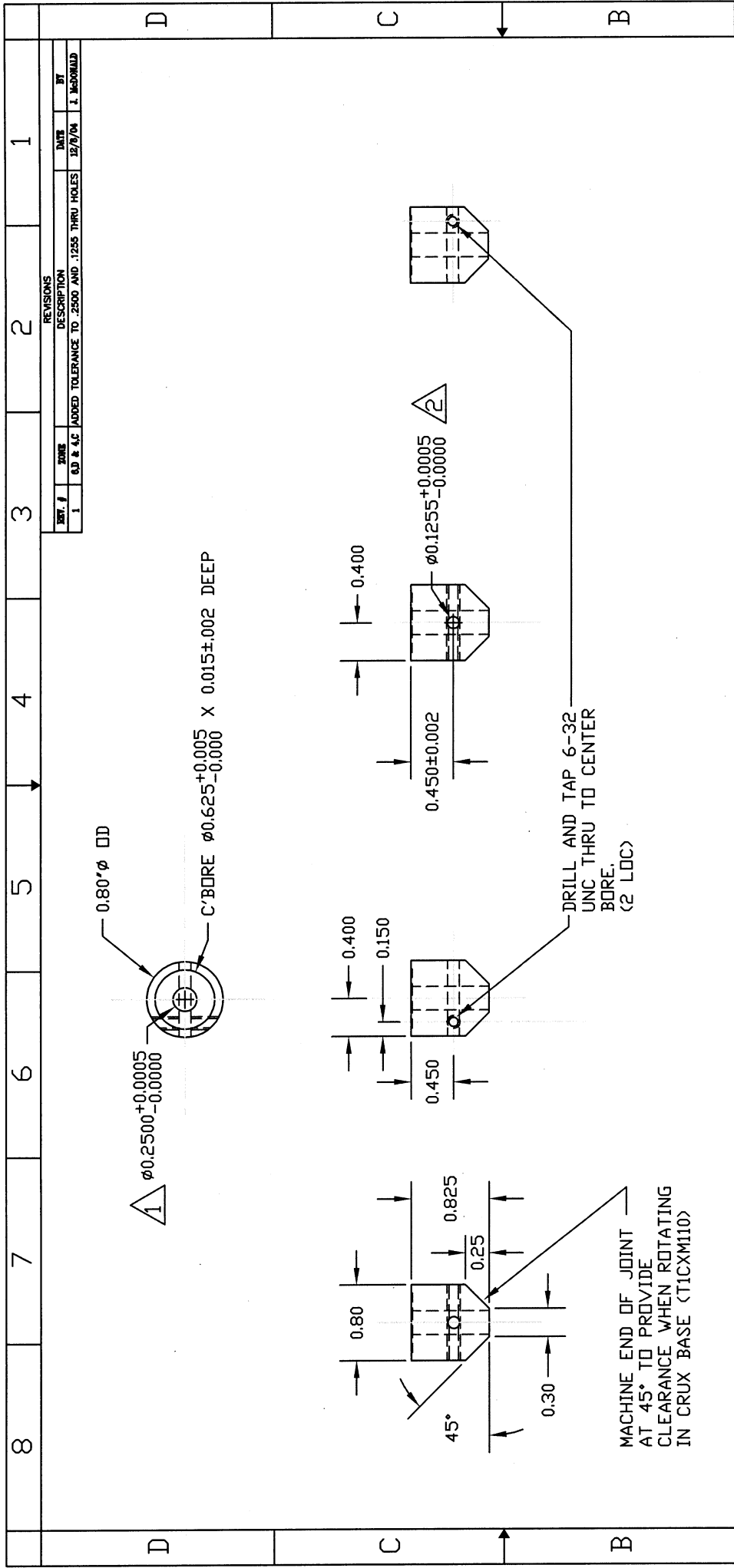
$\phi 0.2500^{+0.0000}_{-0.0005}$ THRU (1 LOC)

DRILL AND TAP FOR 2-56 THRU TO INNER BORE (2 LOC)

DRILL THRU, TAP AND INSERT 10-24 x 0.19" HELI-COIL INSERTS (2 LOC)

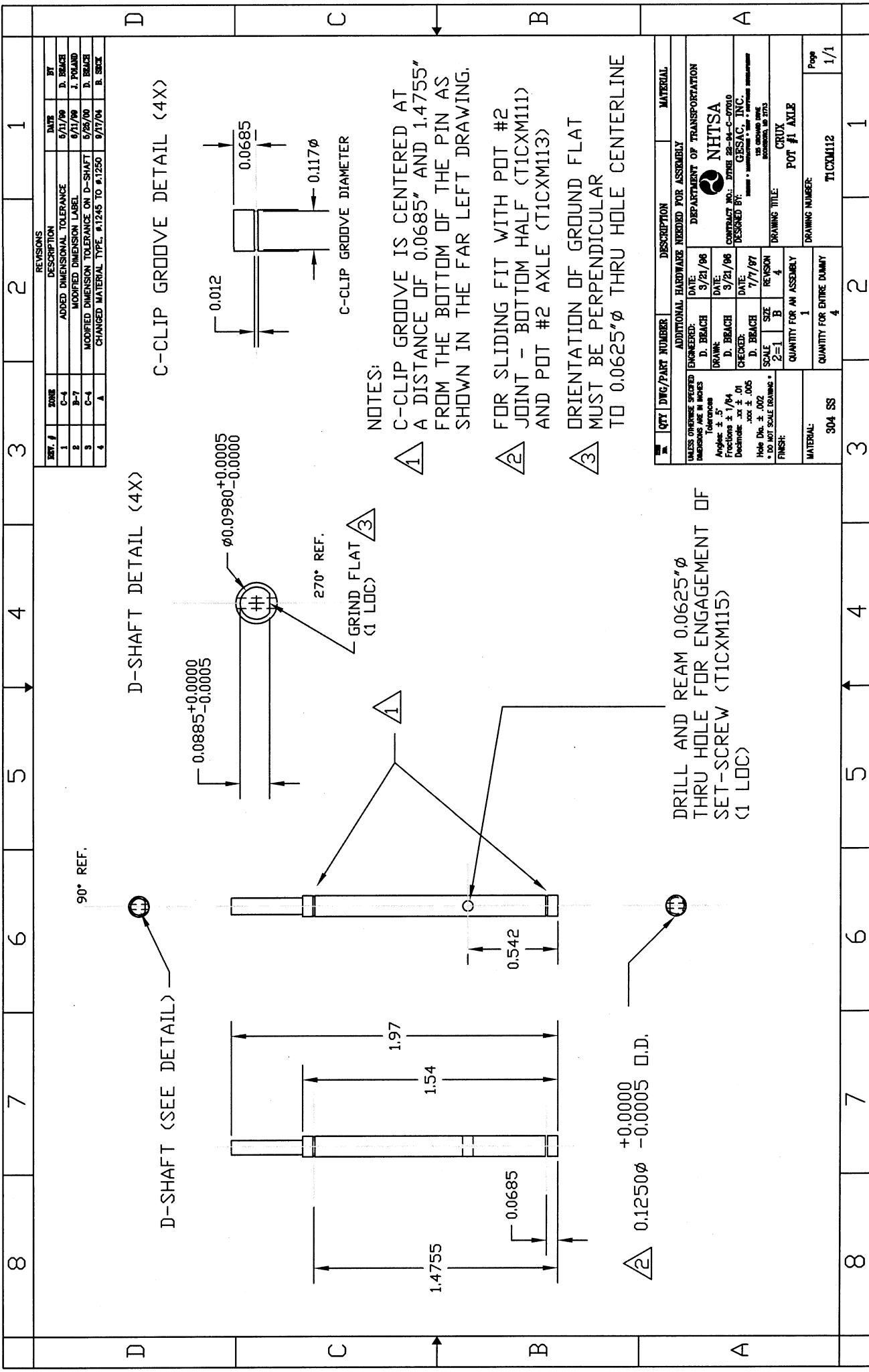
ROUND EDGES OF PIECE ON CIRCLE OF 0.43" R, TYP, CENTERED AT 0.25" ϕ HOLE

$\phi 0.2500^{+0.0000}_{-0.0005}$ THRU (1 LOC)



QTY	DTG/PART NUMBER	DESCRIPTION	MATERIAL
ADDITIONAL HARDWARE NEEDED FOR ASSEMBLY			
ENGINEERED:	D. BEACH	DATE: 5/19/96	DEPARTMENT OF TRANSPORTATION
DRAWN:	D. BEACH	DATE: 5/19/96	NHTSA
CHECKED:	D. BEACH	DATE: 7/7/97	CONTRACT NO.: DTMB 29-94-C-0700
SCALE:	1=1	REASON: 1	DESIGNED BY: GESAC, INC.
FINISH:	1	REASON: 1	DESIGNED BY: GESAC, INC.
QUANTITY FOR AN ASSEMBLY:	1	DRAWING TITLE: CRUX	POT #2 JOINT - BOTTOM HALF
QUANTITY FOR ENTIRE DUNNITY:	4	DRAWING NUMBER: T1CXM111	Page 1/1
MATERIAL:	6061-T6		

NOTES:
 1 $0.2500'' \phi$ THRU HOLE IS TO PROVIDE A SLIDING FIT WITH
 POT #2 AXLE (T1CXM113)
 2 $0.1255'' \phi$ THRU HOLE IS TO PROVIDE A SLIDING FIT WITH
 POT #1 AXLE (T1CXM112)



REV. #	DATE	DESCRIPTION	BY
1	9/17/96	ADDED DIMENSIONAL TOLERANCE	D. BRACK
2	9/17/96	MODIFIED DIMENSION LABEL	J. FOLAND
3	5/28/00	MODIFIED DIMENSION TOLERANCE ON D-SHAFT	D. BRACK
4	9/17/04	CHANGED MATERIAL TYPE, #1245 TO #1250	B. BRACK

D-SHAFT (SEE DETAIL)

D-SHAFT DETAIL (4X)

C-CLIP GROOVE DETAIL (4X)

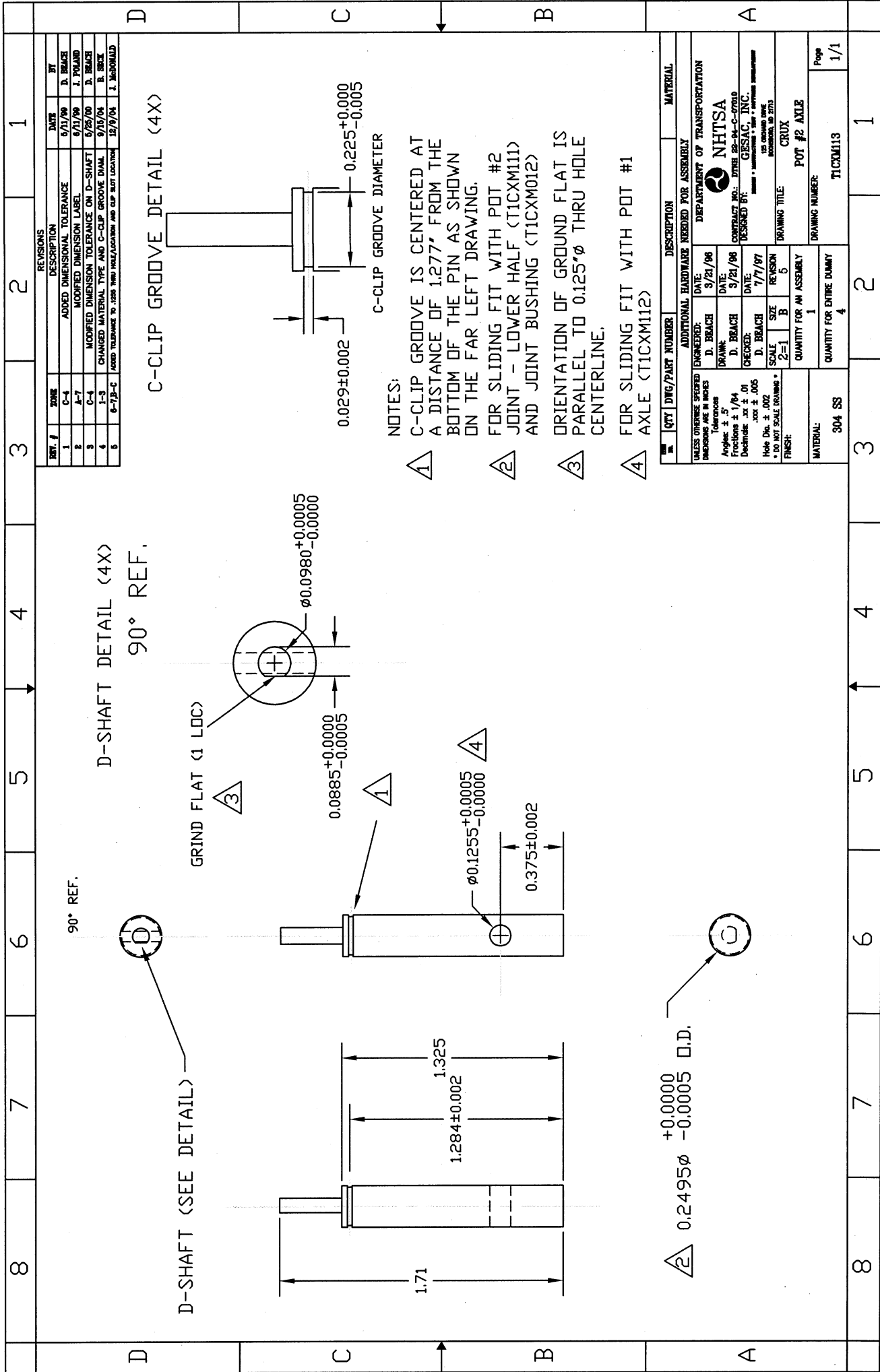
C-CLIP GROOVE DETAIL (4X)

NOTES:

- 1 C-CLIP GROOVE IS CENTERED AT A DISTANCE OF 0.0685" AND 1.4755" FROM THE BOTTOM OF THE PIN AS SHOWN IN THE FAR LEFT DRAWING.
- 2 FOR SLIDING FIT WITH POT #2 JOINT - BOTTOM HALF (TICXM11) AND POT #2 AXLE (TICXM13)
- 3 ORIENTATION OF GROUND FLAT MUST BE PERPENDICULAR TO 0.0625"Ø THRU HOLE CENTERLINE

DRILL AND REAM 0.0625"Ø THRU HOLE FOR ENGAGEMENT OF SET-SCREW (TICXM115) (1 LOC)

QTY	DRG/PART NUMBER	DESCRIPTION	MATERIAL
1		ADDITIONAL HARDWARE NEEDED FOR ASSEMBLY	
1	D. BRACK	ENGINEERED: DATE: 9/21/96	DEPARTMENT OF TRANSPORTATION
1	D. BRACK	DRAWN: DATE: 9/21/96	NHTSA
1	D. BRACK	CHECKED: DATE: 7/7/97	CONTRACT NO.: DTMB 28-94-C-07010
1	D. BRACK	DESIGNED BY: GESAC, INC.	DESIGNED BY: GESAC, INC.
1	D. BRACK	SCALE: 2=1	DESIGNED BY: GESAC, INC.
1	D. BRACK	FINISH: 2=1	DESIGNED BY: GESAC, INC.
1	D. BRACK	REVISION: 4	DESIGNED BY: GESAC, INC.
1	D. BRACK	QUANTITY FOR AN ASSEMBLY: 1	DESIGNED BY: GESAC, INC.
1	D. BRACK	QUANTITY FOR ENTIRE DUMMY: 4	DESIGNED BY: GESAC, INC.
1	D. BRACK	DRAWING TITLE: POT #1 AXLE	DESIGNED BY: GESAC, INC.
1	D. BRACK	DRAWING NUMBER: TICXM112	DESIGNED BY: GESAC, INC.
1	D. BRACK	PAGE: 1/1	DESIGNED BY: GESAC, INC.



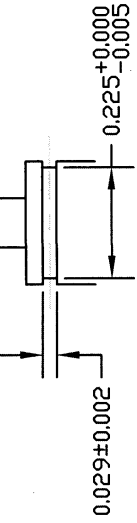
90° REF.

D-SHAFT DETAIL (4X)
90° REF.

D-SHAFT (SEE DETAIL)

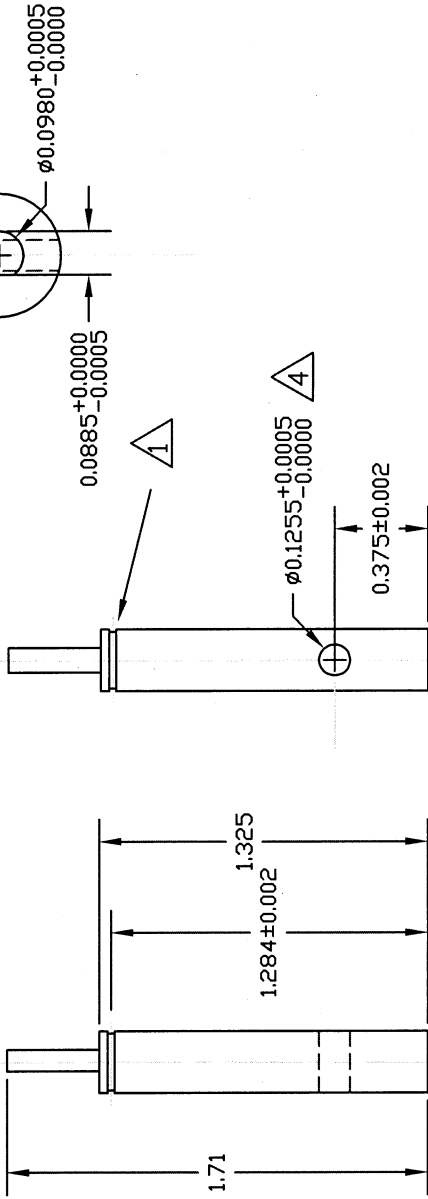
GRIND FLAT (1 LOC)

C-CLIP GROOVE DETAIL (4X)

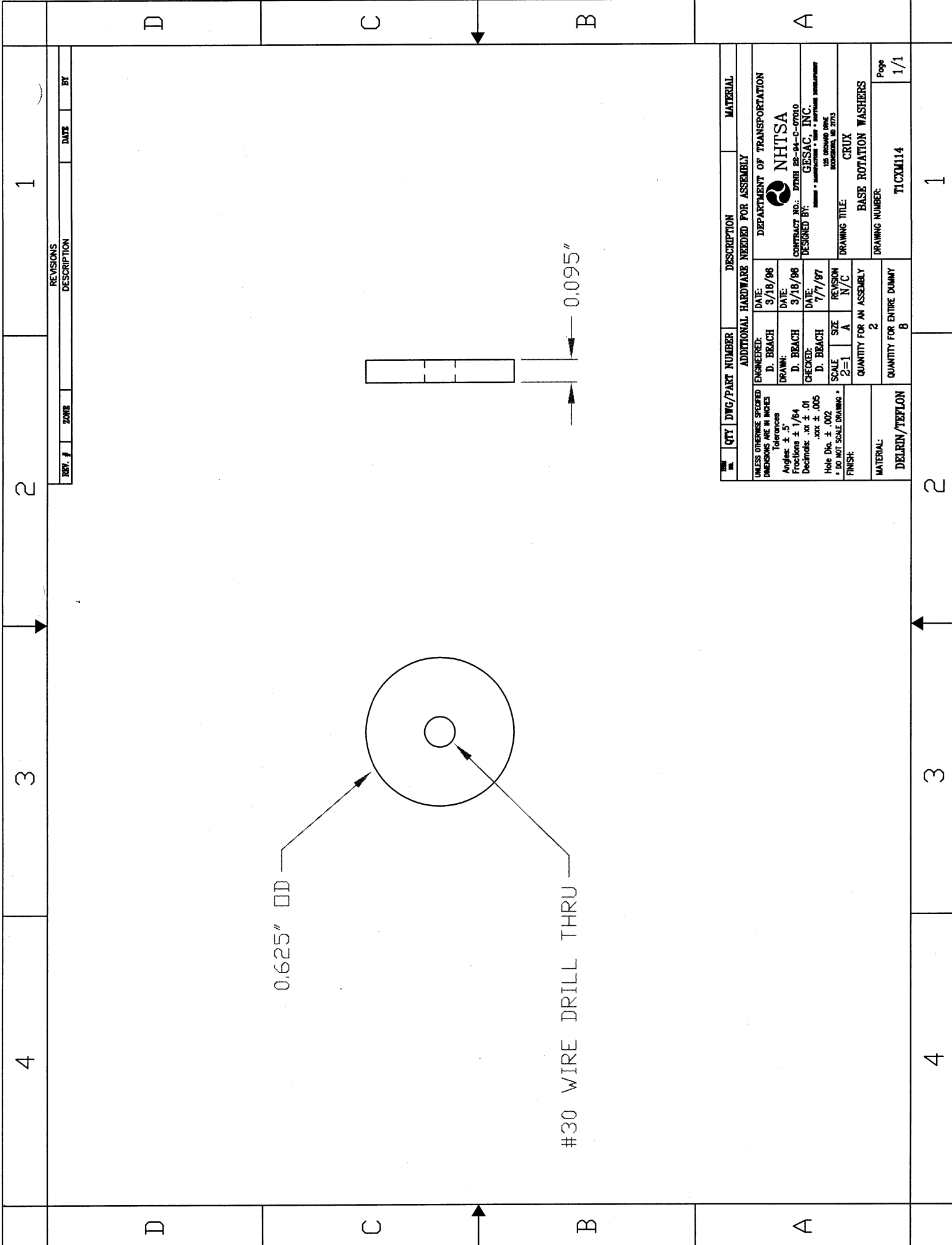


NOTES:

- ① C-CLIP GROOVE IS CENTERED AT A DISTANCE OF 1.277" FROM THE BOTTOM OF THE PIN AS SHOWN ON THE FAR LEFT DRAWING.
- ② FOR SLIDING FIT WITH POT #2 JOINT - LOWER HALF (T1CXM111) AND JOINT BUSHING (T1CXM012)
- ③ ORIENTATION OF GROUND FLAT IS PARALLEL TO 0.125"Ø THRU HOLE CENTERLINE.
- ④ FOR SLIDING FIT WITH POT #1 AXLE (T1CXM112)



② 0.2495^{+0.0000}_{-0.0005} O.D.



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REV. #	ZONE	DATE	BY
REVISIONS DESCRIPTION			

QTY	DWG/PART NUMBER	DESCRIPTION	MATERIAL
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES			
Tolerances			
Angles: ± .5°			
Fractions: ± 1/64			
Decimals: .xx ± .01			
.xxx ± .005			
Hole Dia. ± .002			
* DO NOT SCALE DRAWING *			
FINISH:			
MATERIAL: DELRIN/TEFLON			
ENGINEERED: D. BEACH		DATE: 3/18/06	DEPARTMENT OF TRANSPORTATION
DRAWN: D. BEACH		DATE: 3/18/06	NHTSA
CHECKED: D. BEACH		DATE: 7/7/07	CONTRACT NO.: DTMB 99-04-C-0700
SCALE: 2=1		SIZE: A	DESIGNED BY: GBSAC, INC.
QUANTITY FOR AN ASSEMBLY: 2		REVISION: N/C	1000 • BARRINGTON • STATE STREET • BOSTON, MA 02118
QUANTITY FOR ENTIRE DUMMY: 8		DRAWING TITLE: CRUX	
		BASE ROTATION WASHERS	
		DRAWING NUMBER: T1CXM114	Page 1/1

D C B A

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REV. #	ZONE	DESCRIPTION	DATE	BY

D

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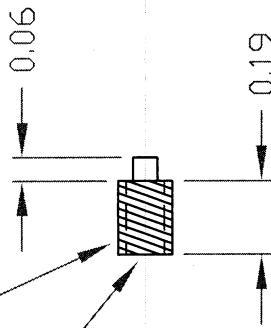
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A

6-32 UNC THREADS

#6-32x1/4" ALLEN HEAD SET SCREW

TIP DIAMETER 0.062 ^{+0.001} _{-0.002}



NOTES:

MANUFACTURE THIS PART FROM 6-32 x 1/4" ALLEN HEAD SET SCREW

1	QTY	MCM #	DWG/PART NUMBER	#6-32 x 1/4" S.S.S. (ALLOY)	DESCRIPTION	PURCHASED MATERIAL
1	1	9231A144				

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES	
Angles	± .5°
Fractions	± 1/64
Decimals	.xx ± .01
Hole Dia.	± .002
* DO NOT SCALE DRAWING *	

ADDITIONAL HARDWARE NEEDED FOR ASSEMBLY		
ENGINEERED:	DATE: 3/21/06	
D. BEACH	DATE: 3/21/06	
DRAWN:	DATE: 3/21/06	
D. BEACH	DATE: 3/21/06	
CHECKED:	DATE: 7/7/97	
D. BEACH	DATE: 7/7/97	
SCALE	SIZE	REVISION
2=1	A	N/C
QUANTITY FOR AN ASSEMBLY: 2		
QUANTITY FOR ENTIRE DUMMY: 8		

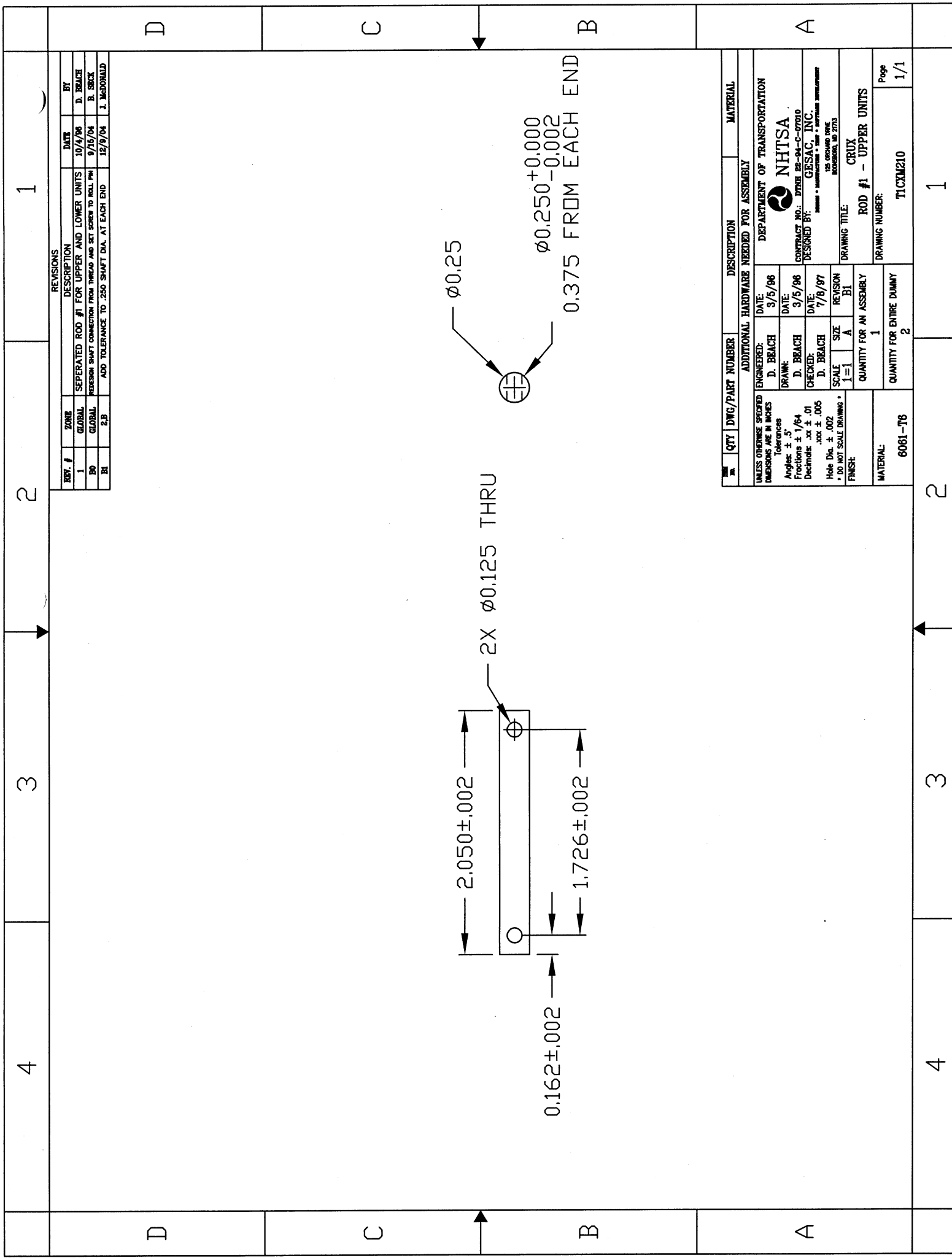
MATERIAL: ALLOY STEEL	
DRAWING NUMBER: TICXM115	
DRAWING TITLE: POT #1 AXLE - SET SCREW	
DESIGNED BY: GESAC, INC.	
CONTRACT NO.: DTMB 22-94-C-07010	
DEPARTMENT OF TRANSPORTATION	
NHTSA	
122 ROCKHAW DRIVE	
BOSSBORO, NJ 07013	
Page 1/1	

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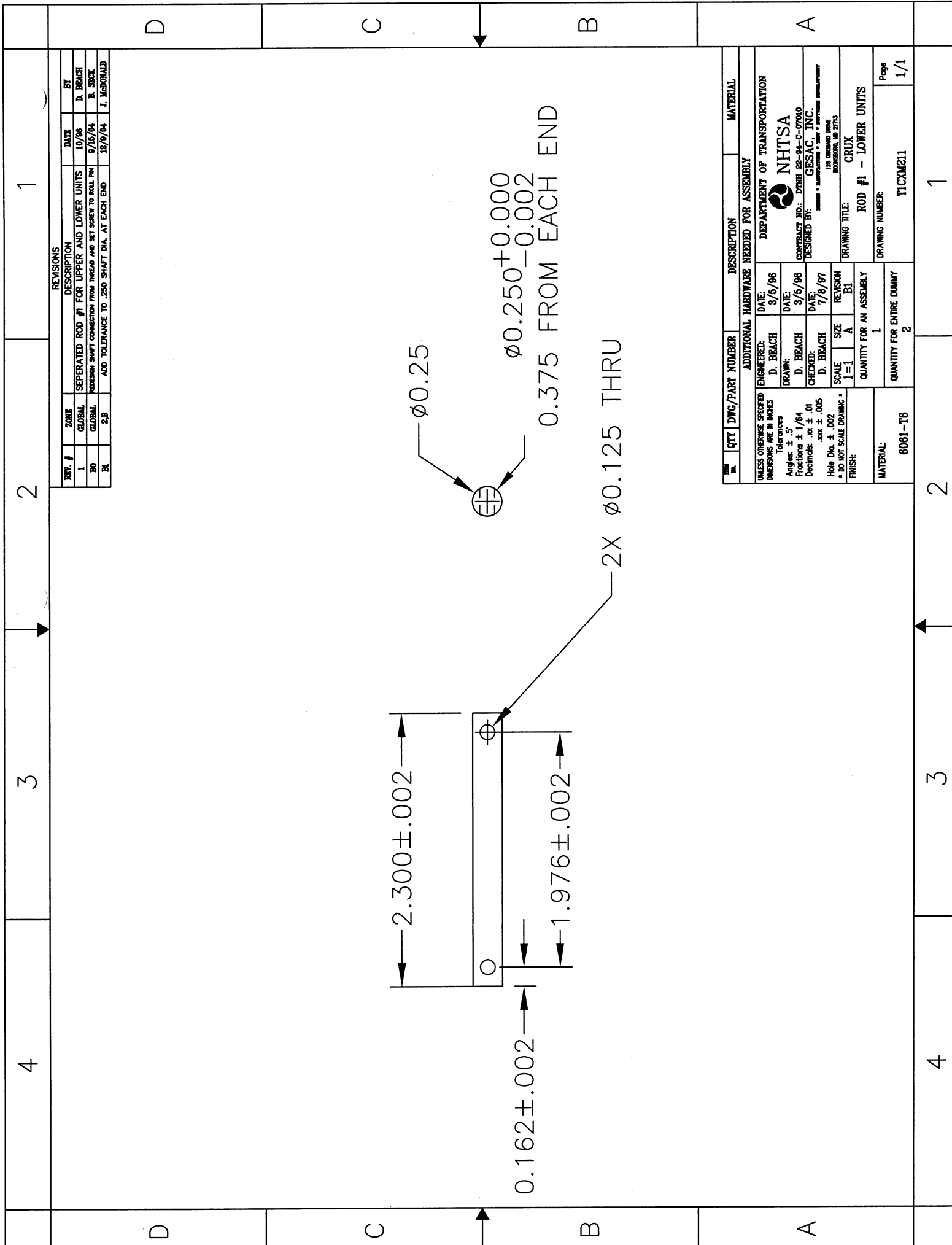
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REV. #	ZONE	DESCRIPTION	DATE	BY
1	GLOBAL	SEPERATED ROD #1 FOR UPPER AND LOWER UNITS	10/4/96	D. BEACH
2	GLOBAL	REDESIGN SHAFT CONNECTION FROM THREAD AND SET SCREW TO ROLL PIN	9/16/04	B. SRECK
3	2,3	ADD TOLERANCE TO .250 SHAFT DIA. AT EACH END	12/9/04	I. McDONALD

QTY	DWG/PART NUMBER	DESCRIPTION	MATERIAL
ADDITIONAL HARDWARE NEEDED FOR ASSEMBLY			
ENGINEERED:	D. BEACH	DATE: 3/5/96	DEPARTMENT OF TRANSPORTATION
DRAWN:	D. BEACH	DATE: 3/5/96	NHTSA
CHECKED:	D. BEACH	DATE: 7/8/97	CONTRACT NO.: DTMB 88-94-C-07010
SCALE	SIZE A	REVISION B1	DESIGNED BY: GESAC, INC.
1=1	A	B1	125 GROUND DRIVE INDIANOLA, MO 6713
QUANTITY FOR AN ASSEMBLY		DRAWING TITLE: CRUX	
1	ROD #1 - UPPER UNITS		
QUANTITY FOR ENTIRE DUMMY		DRAWING NUMBER: T1CXM210	
2	Page 1/1		
MATERIAL: 6081-T6			



REVISIONS

REV. #	ZONE	DESCRIPTION	DATE	BY
1	GLOBAL	SEPERATED ROD #1 FOR UPPER AND LOWER UNITS	10/96	D. BEACH
2	GLOBAL	REVISION SHFT CONNECTION FROM THREAD AND SET SCREW TO ROLL PIN	9/15/04	B. SECK
3	2.B	ADD TOLERANCE TO .250 SHAFT DIA. AT EACH END	12/9/04	J. McDONALD

QTY	DWG/PART NUMBER	DESCRIPTION	MATERIAL
		ADDITIONAL HARDWARE NEEDED FOR ASSEMBLY	
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES			
ENGINEERED:	D. BEACH	DATE: 3/5/96	
DRAWN:	D. BEACH	DATE: 3/5/96	
CHECKED:		DATE: 7/8/97	
SCALE	SIZE	REVISION	
1=1	A	B1	
QUANTITY FOR AN ASSEMBLY: 1			
QUANTITY FOR ENTIRE DUMMY: 2			
MATERIAL: 6061-T6		DRAWING TITLE: CRUX	
		ROD #1 - LOWER UNITS	
		DRAWING NUMBER: T1CKM211	
		Page 1/1	



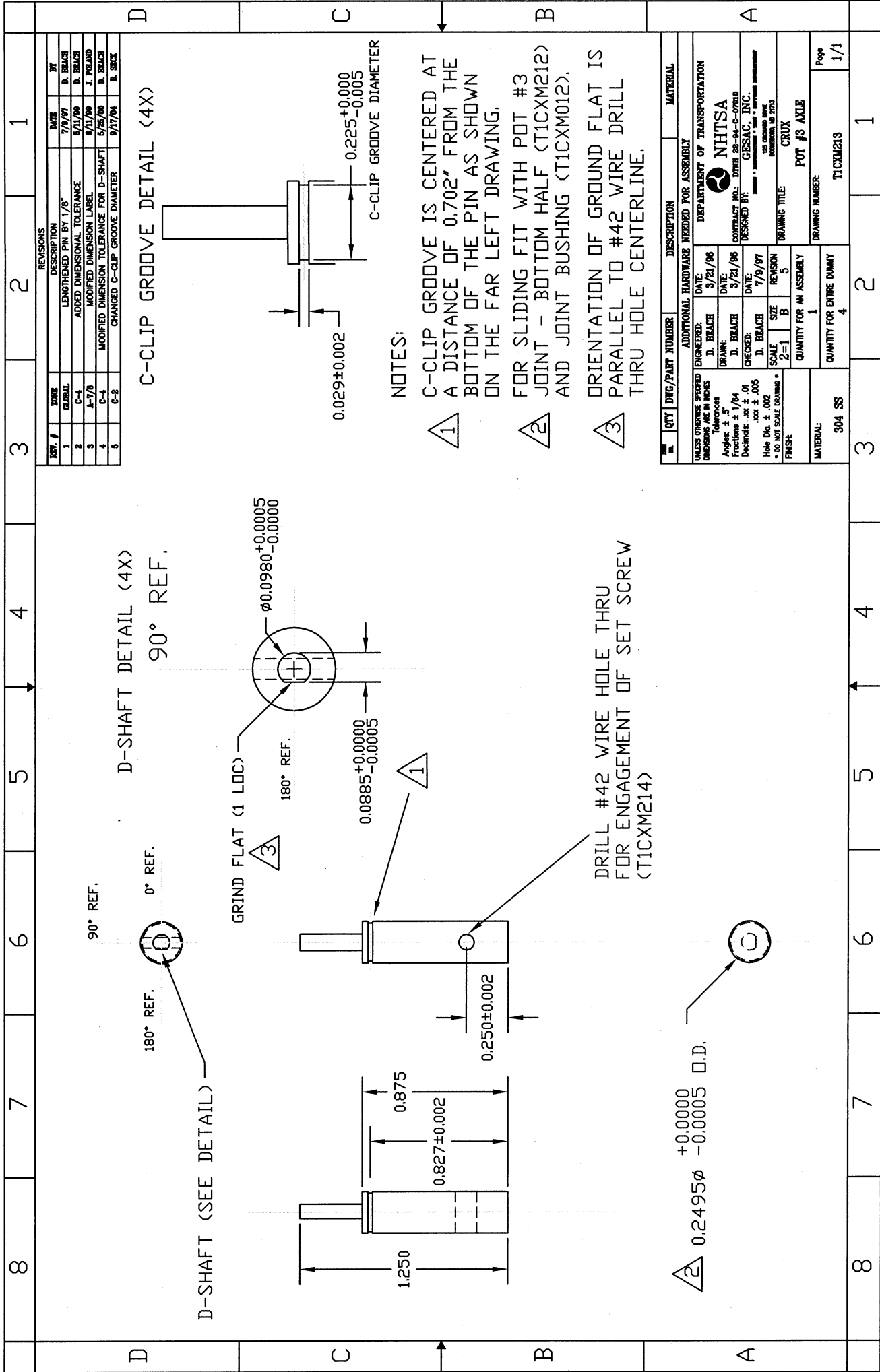
DEPARTMENT OF TRANSPORTATION

CONTRACT NO.: DTMB 28-94-C-07010

DESIGNED BY: GESAC, INC.

125 ORCHARD DRIVE
ROCKFORD, IL 61155

8	7	6	5	4	3	2	1																																												
D							D																																												
C							C																																												
B							B																																												
A							A																																												
8	7	6	5	4	3	2	1																																												
<table border="1"> <thead> <tr> <th>REV #</th> <th>DATE</th> <th>DESCRIPTION</th> <th>BY</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>7/9/97</td> <td>INCREASED THICKNESS BY 1/8"</td> <td>D. BRACE</td> </tr> <tr> <td>2</td> <td>9/14/94</td> <td>ADDED DIMENSIONAL TOLERANCES</td> <td>B. BRACE</td> </tr> <tr> <td>3</td> <td>9/10/94</td> <td>REVISION SHIRT CONNECTION FROM THREAD AND SET SCREW TO ROLL PIN</td> <td>B. BRACE</td> </tr> <tr> <td>6</td> <td>12/9/94</td> <td>ADD TOLERANCES TO MACHINED HOLES / C-BORE</td> <td>J. MADONOLD</td> </tr> </tbody> </table>								REV #	DATE	DESCRIPTION	BY	1	7/9/97	INCREASED THICKNESS BY 1/8"	D. BRACE	2	9/14/94	ADDED DIMENSIONAL TOLERANCES	B. BRACE	3	9/10/94	REVISION SHIRT CONNECTION FROM THREAD AND SET SCREW TO ROLL PIN	B. BRACE	6	12/9/94	ADD TOLERANCES TO MACHINED HOLES / C-BORE	J. MADONOLD																								
REV #	DATE	DESCRIPTION	BY																																																
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6	12/9/94	ADD TOLERANCES TO MACHINED HOLES / C-BORE	J. MADONOLD																																																
<table border="1"> <thead> <tr> <th>QTY</th> <th>DWG/PART NUMBER</th> <th>DESCRIPTION</th> <th>MATERIAL</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>6061-T6</td> <td>ADDITIONAL HARDWARE NEEDED FOR ASSEMBLY</td> <td>NHTSA</td> </tr> <tr> <td>1</td> <td>1</td> <td>ENGINEERED: D. BRACE</td> <td>DEPARTMENT OF TRANSPORTATION</td> </tr> <tr> <td>1</td> <td>1</td> <td>DRAWN: D. BRACE</td> <td>NHTSA</td> </tr> <tr> <td>1</td> <td>1</td> <td>CHECKED: D. BRACE</td> <td>CONTRACT NO.: DTFR 28-94-C-0700</td> </tr> <tr> <td>1</td> <td>1</td> <td>SCALE: 1=1</td> <td>DESIGNED BY: GESAC, INC.</td> </tr> <tr> <td>1</td> <td>1</td> <td>SIZE: B1</td> <td>125 GROUND STRE</td> </tr> <tr> <td>1</td> <td>1</td> <td>REVISION: B1</td> <td>ROCKFORD, IL 6773</td> </tr> <tr> <td>1</td> <td>1</td> <td>QUANTITY FOR AN ASSEMBLY</td> <td>DRAWING TITLE: CRUX</td> </tr> <tr> <td>1</td> <td>1</td> <td>QUANTITY FOR ENTIRE DUMMY</td> <td>POT #3 JOINT - BOTTOM HALF</td> </tr> <tr> <td>1</td> <td>1</td> <td>DRAWING NUMBER: TICXM212</td> <td>Page 1/1</td> </tr> </tbody> </table>								QTY	DWG/PART NUMBER	DESCRIPTION	MATERIAL	1	6061-T6	ADDITIONAL HARDWARE NEEDED FOR ASSEMBLY	NHTSA	1	1	ENGINEERED: D. BRACE	DEPARTMENT OF TRANSPORTATION	1	1	DRAWN: D. BRACE	NHTSA	1	1	CHECKED: D. BRACE	CONTRACT NO.: DTFR 28-94-C-0700	1	1	SCALE: 1=1	DESIGNED BY: GESAC, INC.	1	1	SIZE: B1	125 GROUND STRE	1	1	REVISION: B1	ROCKFORD, IL 6773	1	1	QUANTITY FOR AN ASSEMBLY	DRAWING TITLE: CRUX	1	1	QUANTITY FOR ENTIRE DUMMY	POT #3 JOINT - BOTTOM HALF	1	1	DRAWING NUMBER: TICXM212	Page 1/1
QTY	DWG/PART NUMBER	DESCRIPTION	MATERIAL																																																
1	6061-T6	ADDITIONAL HARDWARE NEEDED FOR ASSEMBLY	NHTSA																																																
1	1	ENGINEERED: D. BRACE	DEPARTMENT OF TRANSPORTATION																																																
1	1	DRAWN: D. BRACE	NHTSA																																																
1	1	CHECKED: D. BRACE	CONTRACT NO.: DTFR 28-94-C-0700																																																
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1	1	SIZE: B1	125 GROUND STRE																																																
1	1	REVISION: B1	ROCKFORD, IL 6773																																																
1	1	QUANTITY FOR AN ASSEMBLY	DRAWING TITLE: CRUX																																																
1	1	QUANTITY FOR ENTIRE DUMMY	POT #3 JOINT - BOTTOM HALF																																																
1	1	DRAWING NUMBER: TICXM212	Page 1/1																																																



1 2 3 4

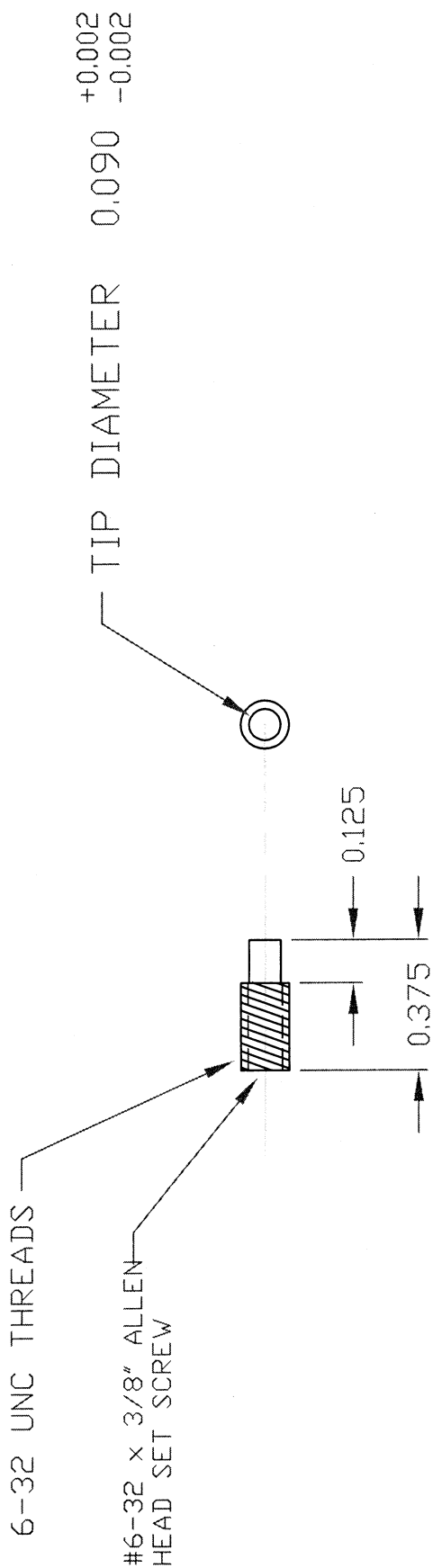
REV. #	ZONE	DESCRIPTION	DATE	BY
1	A-1	CHANGED QUANTITY REQUIRED	2/16/99	D. BEACH
2	TITLE	CHANGED DRAWING NUMBER	6/11/99	J. POLAND

D

C

B

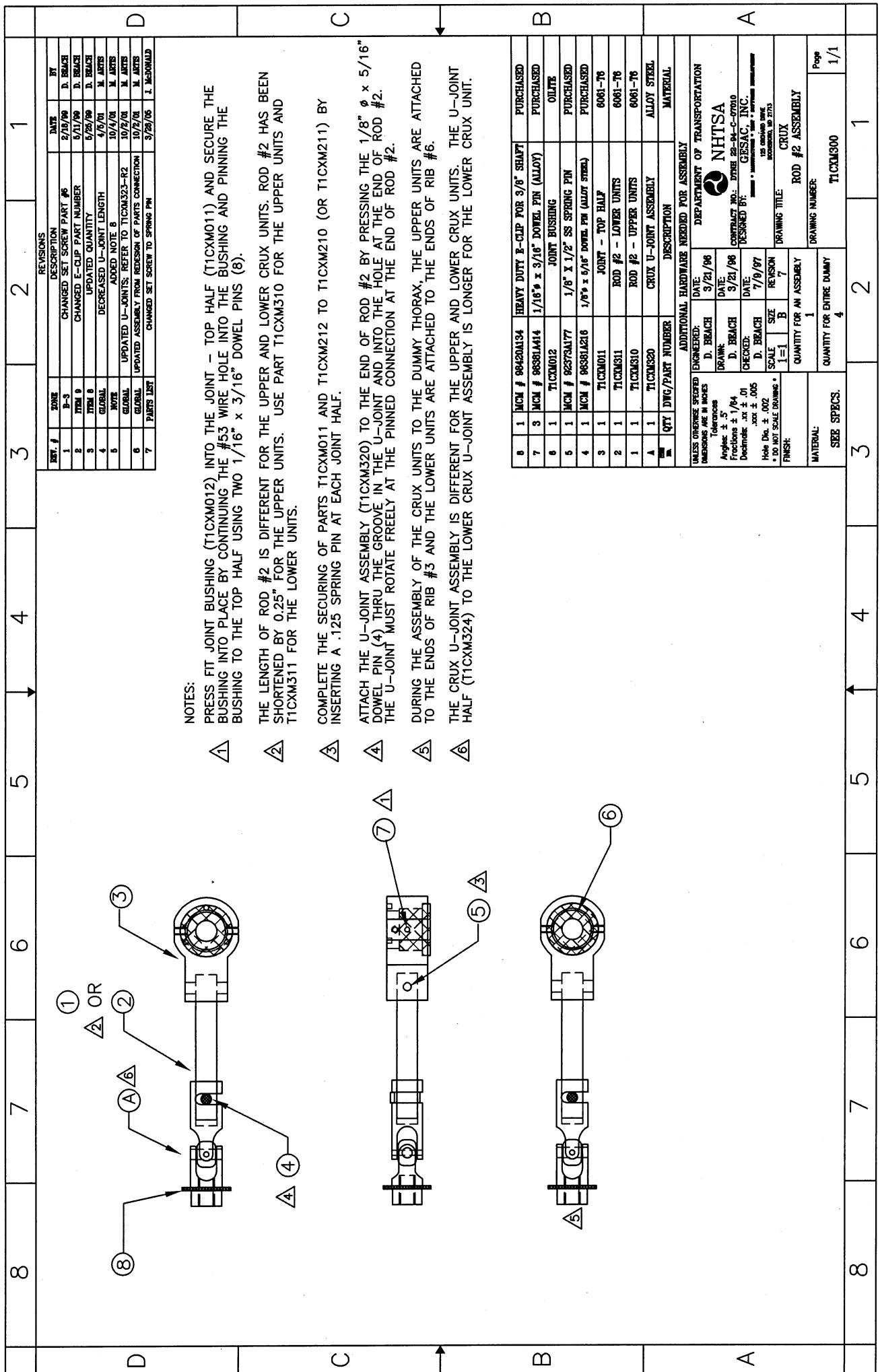
A



NOTES:
 MANUFACTURE THIS PART FROM 6-32 UNC x 3/8"
 ALLEN HEAD SET SCREW

REV. #	QTY	MCM #	DWG/PART NUMBER	#6-32 x 3/8" CUP POINT S.S.S. (ALLOY)	DESCRIPTION	PURCHASED MATERIAL
1		91375A146			ADDITIONAL HARDWARE NEEDED FOR ASSEMBLY	
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES						
Tolerances						
Angles: ± .5°						
Fractions: ± 1/64						
Decimals: .xx ± .01						
.xxx ± .005						
Hole Dia. ± .002						
* DO NOT SCALE DRAWING *						
FINISH						
		ENGINEERED:	D. BEACH	DATE:	9/21/96	
		DRAWN:	D. BEACH	DATE:	9/21/96	
		CHECKED:	D. BEACH	DATE:	7/9/97	
		SCALE	2=1	SIZE	A	
		REVISION	2	QUANTITY FOR AN ASSEMBLY	2	
		DRAWING NUMBER:		TTCXM214		Page 1/1
		DRAWING TITLE:		SET SCREW		
		MATERIAL:		ALLOY STEEL		

4 3 2 1



REV. #	ZONE	DESCRIPTION	DATE	BY
1	B-3	CHANGED SET SCREW PART #6	2/20/90	D. BRACH
2	ITEM 9	CHANGED E-CLIP PART NUMBER	5/31/90	D. BRACH
3	ITEM 9	UPDATED QUANTITY	5/25/90	D. BRACH
4	GENERAL	DECREASED U-JOINT LENGTH	4/7/91	M. AKERS
5	NOTE	ADDED NOTE 8	10/4/91	M. AKERS
6	GENERAL	UPDATED U-JOINTS; REFER TO T1CXM323-R2	10/2/91	M. AKERS
7	GENERAL	UPDATED ASSEMBLY FROM REVISION OF PARTS CONNECTION	10/2/91	M. AKERS
	PARTS LIST	CHANGED SET SCREW TO SPRING PIN	3/29/95	J. McDONALD

NOTES:

- ① PRESS FIT JOINT BUSHING (T1CXM012) INTO THE JOINT - TOP HALF (T1CXM011) AND SECURE THE BUSHING INTO PLACE BY CONTINUING THE #53 WIRE HOLE INTO THE BUSHING AND PINNING THE BUSHING TO THE TOP HALF USING TWO 1/16" x 3/16" DOWEL PINS (8).
- ② THE LENGTH OF ROD #2 IS DIFFERENT FOR THE UPPER AND LOWER CRUX UNITS. ROD #2 HAS BEEN SHORTENED BY 0.25" FOR THE UPPER UNITS. USE PART T1CXM310 FOR THE UPPER UNITS AND T1CXM311 FOR THE LOWER UNITS.
- ③ COMPLETE THE SECURING OF PARTS T1CXM011 AND T1CXM212 TO T1CXM210 (OR T1CXM211) BY INSERTING A .125 SPRING PIN AT EACH JOINT HALF.
- ④ ATTACH THE U-JOINT ASSEMBLY (T1CXM320) TO THE END OF ROD #2 BY PRESSING THE 1/8" ϕ x 5/16" DOWEL PIN (4) THRU THE GROOVE IN THE U-JOINT AND INTO THE HOLE AT THE END OF ROD #2. THE U-JOINT MUST ROTATE FREELY AT THE PINNED CONNECTION AT THE END OF ROD #2.
- ⑤ DURING THE ASSEMBLY OF THE CRUX UNITS TO THE DUMMY THORAX, THE UPPER UNITS ARE ATTACHED TO THE ENDS OF RIB #5 AND THE LOWER UNITS ARE ATTACHED TO THE ENDS OF RIB #6.
- ⑥ THE CRUX U-JOINT ASSEMBLY IS DIFFERENT FOR THE UPPER AND LOWER CRUX UNITS. THE U-JOINT HALF (T1CXM324) TO THE LOWER CRUX U-JOINT ASSEMBLY IS LONGER FOR THE LOWER CRUX UNIT.

QTY	DWG/PART NUMBER	DESCRIPTION	MATERIAL
0	MCM # 98420M134	HEAVY DUTY E-CLIP FOR 3/8" SHAFT	PURCHASED
7	MCM # 98381A144	1/16" ϕ x 3/16" DOWEL PIN (ALLOY)	PURCHASED
6	T1CXM012	JOINT BUSHING	OLITE
5	MCM # 92373M177	1/8" X 1/2" SS SPRING PIN	PURCHASED
4	MCM # 98381A216	1/8" x 9/16" DOWEL PIN (ALLOY STEEL)	PURCHASED
3	T1CXM011	JOINT - TOP HALF	6061-T6
2	T1CXM311	ROD #2 - LOWER UNITS	6061-T6
1	T1CXM310	ROD #2 - UPPER UNITS	6061-T6
A	T1CXM320	CRUX U-JOINT ASSEMBLY	ALLOY STEEL
		ADDITIONAL HARDWARE NEEDED FOR ASSEMBLY	MATERIAL

UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN INCHES

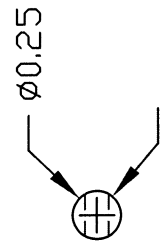
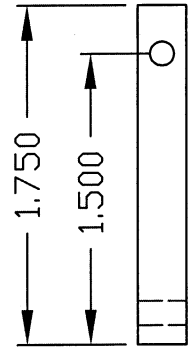
ENGINEERED: DATE: 3/21/98
 D. BRACH
 Tolerances
 Angles: $\pm .5^\circ$
 Fractions: $\pm 1/64$
 Decimals: .xx $\pm .01$
 .xxx $\pm .005$
 Hole Dia. $\pm .002$
 * DO NOT SCALE DRAWING *
 FINISH: 1=1 B 7

DEPARTMENT OF TRANSPORTATION
 NHTSA
 CONTRACT NO.: DOT/HS 22-94-C-07010
 DESIGNED BY: GESAC, INC.
 DRAWING TITLE: CRUX
 ROD #2 ASSEMBLY

QUANTITY FOR AN ASSEMBLY: 1
 QUANTITY FOR ENTIRE DUMMY: 4
 DRAWING NUMBER: T1CXM300
 Page: 1/1

2X $\phi 0.125$ THRU

0.162 ± 0.002



$\phi 0.250^{+0.000}_{-0.002}$
0.375 FROM EACH END

REV. #	ZONE	DESCRIPTION	DATE	BY
01	GLOBAL	REDESIGN SHAFT CONNECTION FROM THREAD AND SET SCREW TO ROLL PIN	9/15/04	B. SREX
02	2,B	ADD TOLERANCE TO .250 SHAFT DIA. AT EACH END	12/9/04	J. McDONALD

QTY	DWG/PART NUMBER	DESCRIPTION	MATERIAL
ADDITIONAL HARDWARE NEEDED FOR ASSEMBLY			
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES			
ENGINEERED:	D. BEACH	DATE:	3/5/96
DRAWN:	D. BEACH	DATE:	3/5/96
CHECKED:	D. BEACH	DATE:	7/10/97
SCALE:	1=1	SIZE:	A
FINISH:		REVISION:	B1
MATERIAL:		QUANTITY FOR AN ASSEMBLY:	1
6061-T6		QUANTITY FOR ENTIRE DUMMY:	2
		DRAWING TITLE:	CRUX
		ROD #2 - UPPER UNITS	
		DRAWING NUMBER:	T1CKM310
		Page	1/1

DEPARTMENT OF TRANSPORTATION
NHTSA
CONTRACT NO.: DTMB 96-94-C-07010
DESIGNED BY: GESSAC, INC.
151 GUYARD ST.
ROCKFORD, IL 61103

DRAWING TITLE: CRUX
ROD #2 - UPPER UNITS
DRAWING NUMBER: T1CKM310

Page 1/1

1

2

3

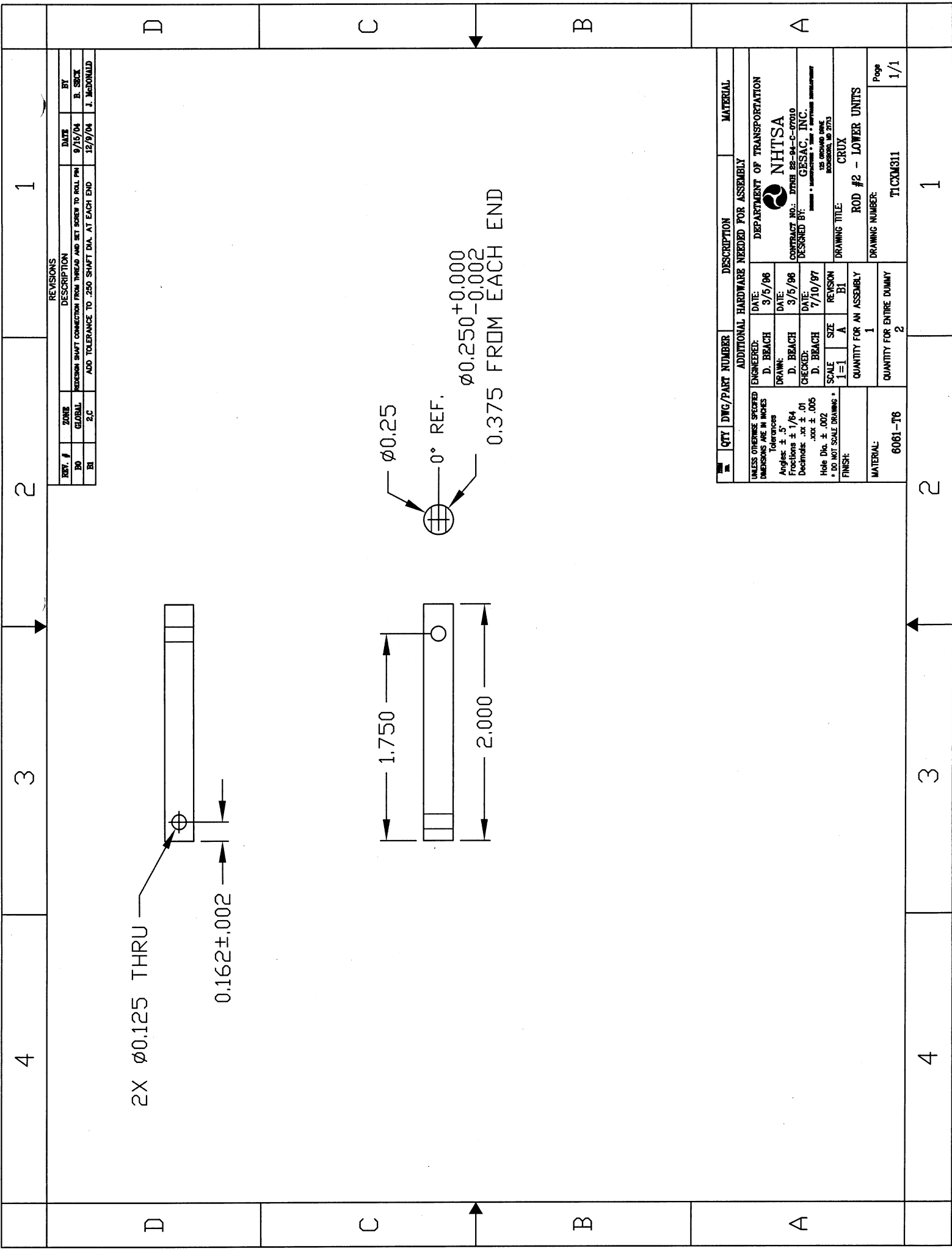
4

1

2

3

4



2X $\phi 0.125$ THRU

0.162 ± 0.002

1.750

2.000

$\phi 0.25$

0° REF.

$\phi 0.250^{+0.000}_{-0.002}$
 0.375 FROM EACH END

REVISIONS		
REV. #	ZONE	DESCRIPTION
01	GLOBAL	REVISION SHAFT CONNECTION FROM THREAD AND SET SCREW TO ROLL PIN
02	2C	ADD TOLERANCE TO .250 SHAFT DIA. AT EACH END

DATE	BY
9/15/04	B. SECK
12/9/04	J. McDONALD

QTY	DWG/PART NUMBER	DESCRIPTION	MATERIAL
		ADDITIONAL HARDWARE NEEDED FOR ASSEMBLY	
	ENGINEERED: D. BEACH	DATE: 3/5/06	
	DRAWN: D. BEACH	DATE: 3/5/06	
	CHECKED: D. BEACH	DATE: 7/10/07	
	SCALE: 1=1	SIZE: A	
	REVISION: B1		
	QUANTITY FOR AN ASSEMBLY: 1		
	QUANTITY FOR ENTIRE DUMMY: 2		
	MATERIAL: 6061-T6		
		DEPARTMENT OF TRANSPORTATION	
		NHTSA	
		CONTRACT NO.: DTPE 28-94-C-07010	
		DESIGNED BY: GESAC, INC.	
		10000 W. UNIVERSITY BLVD. • ANNAPOLIS, MD 20713	
		DRAWING TITLE: CRUX	
		ROD #2 - LOWER UNITS	
		DRAWING NUMBER: T1CXM311	Page 1/1

REVISIONS				
REV. #	ZONE	DESCRIPTION	DATE	BY
1	FROM 1,2,3	CHANGED MATERIAL TO SS	5/11/96	D. BEACH
2	GLOBAL	DECREASED U-JOINT LENGTH	4/5/01	M. ARTS
3	GLOBAL	MADE MODS ACCORDING TO TICXM323-R3	10/4/01	M. ARTS
	DA	ADDED ADDITIONAL HARDWARE-ITEM 6	10/4/01	M. ARTS
	NOTES	RE-NUMBERED NOTES AND CREATED NOTE 4	10/4/01	M. ARTS
	AI	MODIFIED DWG DESCRIPTION FOR ITEM 1	10/4/01	M. ARTS
4	NOTES	ADDED NOTE 6 AND EDITED HARDWARE LIST	12/4/04	J. McDONALD

NOTES:

THE U-JOINT IS ASSEMBLED USING THE PARTS FROM A KIT WHICH CONTAINS A SOLID, UNASSEMBLED 3/8" BELDEN U-JOINT THE JOINT COMES COMPLETE WITH ALL PARTS REQUIRED FOR ASSEMBLY, INCLUDING THE PINS AND CENTER BLOCK.

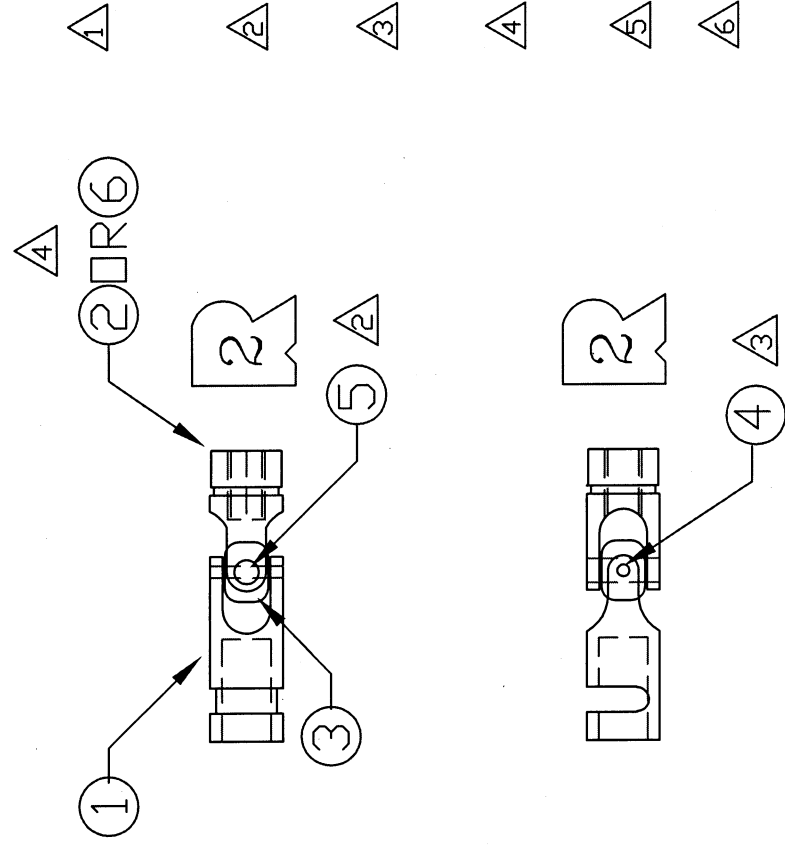
THE CENTER BLOCK IS PINNED TO THE RIB CONNECTION END TICXM323 USING THE 1/8" ϕ PIN. THE 1/16" HOLE IN THE CENTER BLOCK AND THE 1/8" PIN ARE ALIGNED.

THE ROTATION END (TICXM322) IS PINNED TO THE CENTER BLOCK USING THE 1/16" PIN. THIS PIN IS SECURED IN PLACE BY GENTLY PEENING THE ENDS OF THE PIN WITH A SMALL TACK HAMMER.

THE LENGTH OF THE U-JOINT HALF-RIB CONNECTION ON THE UPPER AND LOWER CRUX UNITS ARE DIFFERENT. USE PART TICXM323 FOR THE UPPER CRUX UNITS AND TICXM324 FOR THE LOWER CRUX UNITS.

AFTER THE ASSEMBLY IS COMPLETE, THE U-JOINT IS CHECKED FOR SMOOTH MOTION AND REASSEMBLED IF NECESSARY.

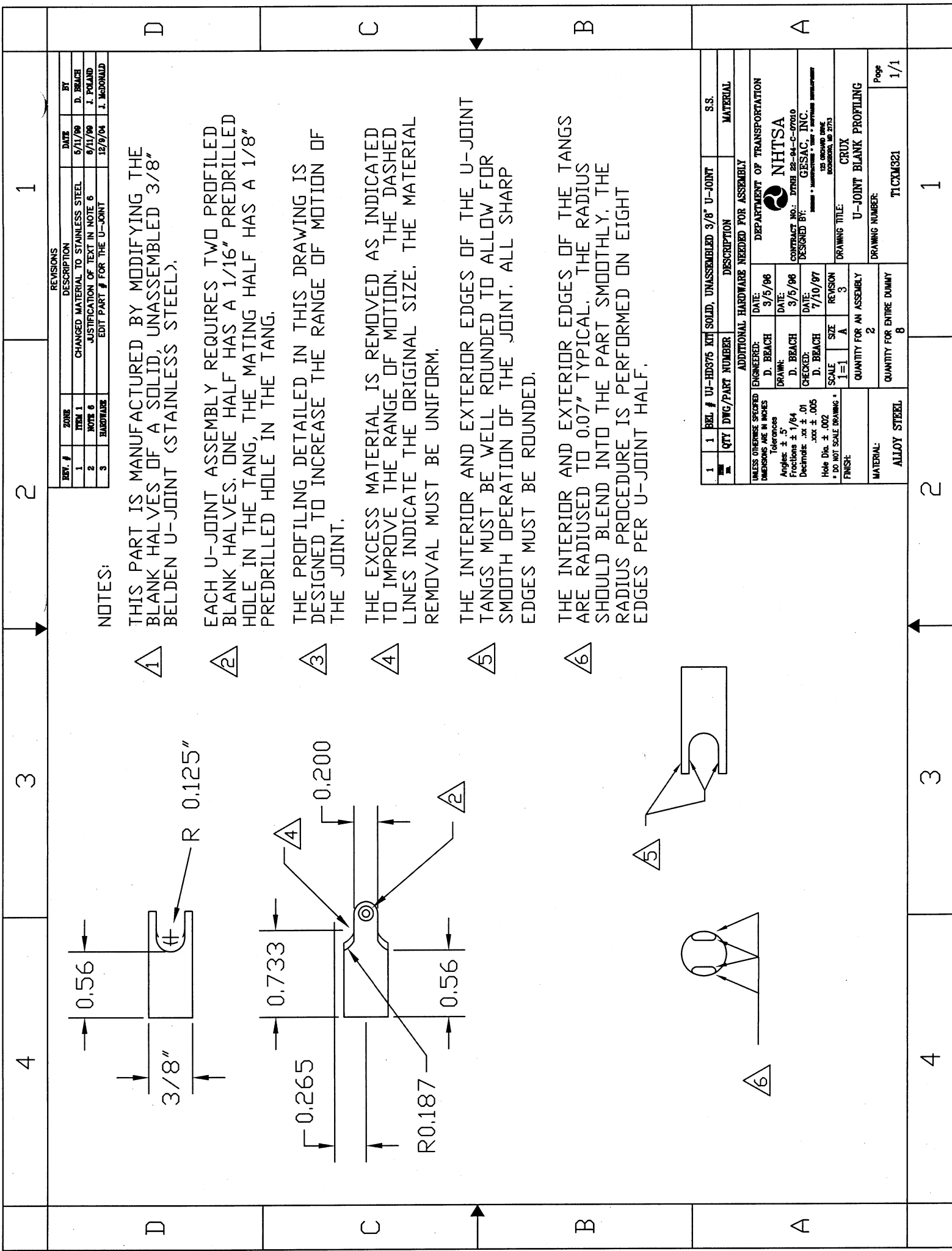
PARTS ARE INCLUDED IN A BELDEN KIT LISTED AS A HARDWARE ITEM OF DRAWING TICXM321.



QTY	DWG/PART NUMBER	DESCRIPTION	MATERIAL
6	1	TICXM324	U-JOINT HALF - RIB END (LOWER UNIT)
5	1	①	1/8" ϕ \pm 0.375 U-JOINT PIN
4	1	②	1/16" ϕ \pm 0.40" U-JOINT PIN
3	1	③	U-JOINT CENTER BLOCK
2	1	TICXM323	U-JOINT HALF - RIB END (UPPER UNIT)
1	1	TICXM322	U-JOINT HALF - ROTATION END

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES	
ENGINEERED:	D. BEACH
DATE:	3/5/96
DRAWN:	D. BEACH
DATE:	3/5/96
CHECKED:	D. BEACH
DATE:	7/10/97
SCALE:	1=1
Hole Dia. \pm .002	SIZE
* DO NOT SCALE DRAWING *	A
FINISH:	4

ADDITIONAL HARDWARE NEEDED FOR ASSEMBLY	
DEPARTMENT OF TRANSPORTATION	NHTSA
CONTRACT NO.: DPNB 82-94-C-07010	DESIGNED BY: GESAC, INC.
125 DEERING DRIVE, ROCKFORD, IL 61113	
DRAWING TITLE:	CRUX
U-JOINT - MECHANICAL ASSEMBLY	DRAWING NUMBER:
TICXM320	Page 1/1



NOTES:

THIS PART IS MANUFACTURED BY MODIFYING THE BLANK HALVES OF A SOLID, UNASSEMBLED 3/8" BELDEN U-JOINT (STAINLESS STEEL).

EACH U-JOINT ASSEMBLY REQUIRES TWO PROFILED BLANK HALVES. ONE HALF HAS A 1/16" PREDRILLED HOLE IN THE TANG, THE MATING HALF HAS A 1/8" PREDRILLED HOLE IN THE TANG.

THE PROFILING DETAILED IN THIS DRAWING IS DESIGNED TO INCREASE THE RANGE OF MOTION OF THE JOINT.

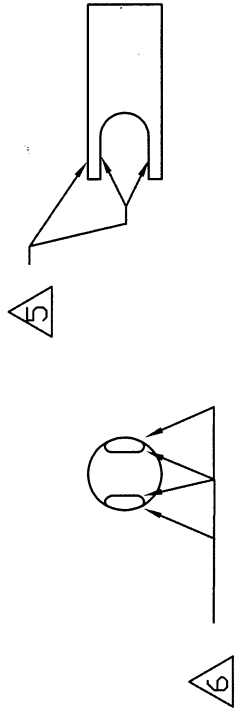
THE EXCESS MATERIAL IS REMOVED AS INDICATED TO IMPROVE THE RANGE OF MOTION. THE DASHED LINES INDICATE THE ORIGINAL SIZE. THE MATERIAL REMOVAL MUST BE UNIFORM.

THE INTERIOR AND EXTERIOR EDGES OF THE U-JOINT TANGS MUST BE WELL ROUNDED TO ALLOW FOR SMOOTH OPERATION OF THE JOINT. ALL SHARP EDGES MUST BE ROUNDED.

THE INTERIOR AND EXTERIOR EDGES OF THE TANGS ARE RADIUS TO 0.07" TYPICAL. THE RADIUS SHOULD BLEND INTO THE PART SMOOTHLY. THE RADIUS PROCEDURE IS PERFORMED ON EIGHT EDGES PER U-JOINT HALF.

REVISIONS				
REV. #	ZONE	DESCRIPTION	DATE	BY
1		CHANGED MATERIAL TO STAINLESS STEEL	5/11/98	D. BEACH
2		JUSTIFICATION OF TEXT IN NOTE 6	6/11/98	J. POLLARD
3		EDIT PART # FOR THE U-JOINT	12/9/04	J. McDONALD

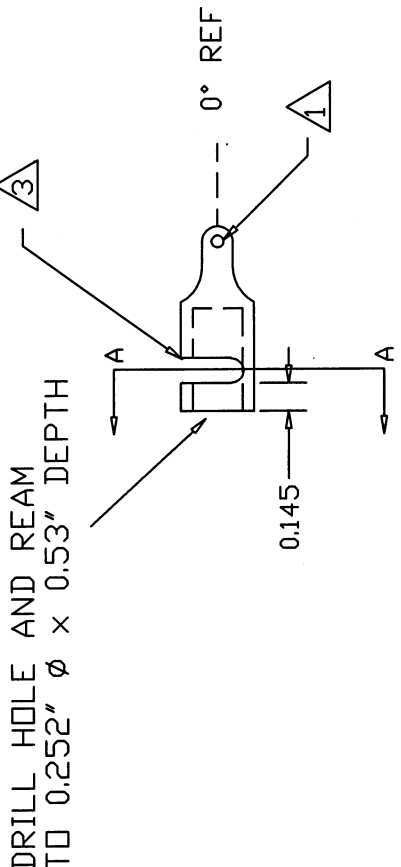
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QTY	DWG/PART NUMBER	DESCRIPTION		MATERIAL	
1	BEL # UJ-HD376 KIT SOLID, UNASSEMBLED 3/8" U-JOINT	S.S.			
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES					
Tolerances					
Angles: ± .5°					
Fractions: ± 1/64					
Decimals: .xx ± .01					
Hole Dia: ± .002					
* DO NOT SCALE DRAWING *					
FINISH:					
ENGINEERED:		DATE:		S.S.	
D. BEACH		3/5/98			
DRAWN:		DATE:		MATERIAL	
D. BEACH		3/5/98		NHTSA	
CHECKED:		DATE:		DEPARTMENT OF TRANSPORTATION	
D. BEACH		7/10/97		CONTRACT NO.: DTMB 28-94-C-07010	
SCALE:		REVISION		DESIGNED BY: GESAC, INC.	
1=1		A		125 WOODLAND DRIVE	
QUANTITY FOR AN ASSEMBLY		2		DRAWING TITLE: CRUX	
QUANTITY FOR ENTIRE DUMMY		8		U-JOINT BLANK PROFILING	
MATERIAL:		ALLOY STEEL		DRAWING NUMBER: T1CXKM321	
				Page 1/1	



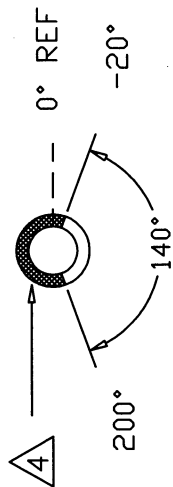
REVISIONS				
REV. #	ZONE	DESCRIPTION	DATE	BY
1	1	CHANGED MATERIAL TO STAINLESS STEEL	6/11/96	D. BEACH
2	3	CORRECTED SPELLING ERROR IN NOTE 3	6/11/96	J. POWLAND
3		EDIT HARDWARE LISTING AND NOTE 1	12/9/04	J. McKNOWLD

NOTES:

- ① THIS PART IS MANUFACTURED FROM A SOLID, 3/8" BELDEN U-JOINT HALF WITH A (1/16"Ø) PRE-DRILLED HOLE IN THE TANG. THE U-JOINT HALF IS INCLUDED IN THE KIT LISTED ON DRAWING TICXM321.
- ② THE U-JOINT HALF MUST BE PROFILED AS INDICATED IN TICXM321.
- ③ MACHINE GROOVE CENTERED AT A DISTANCE OF 0.210" THRU THE WALL DEPTH. GROOVE SPANS ANGULAR AREA FROM -20 TO 200 DEGREES.
- ④ END VIEW OF GROOVED SECTION. THE SHADED AREA INDICATES THE MATERIAL TO BE REMOVED.
- ⑤ ENDS OF GROOVE HAVE 0.0625" RADIUS (TYP.)



SECTION A-A DETAIL

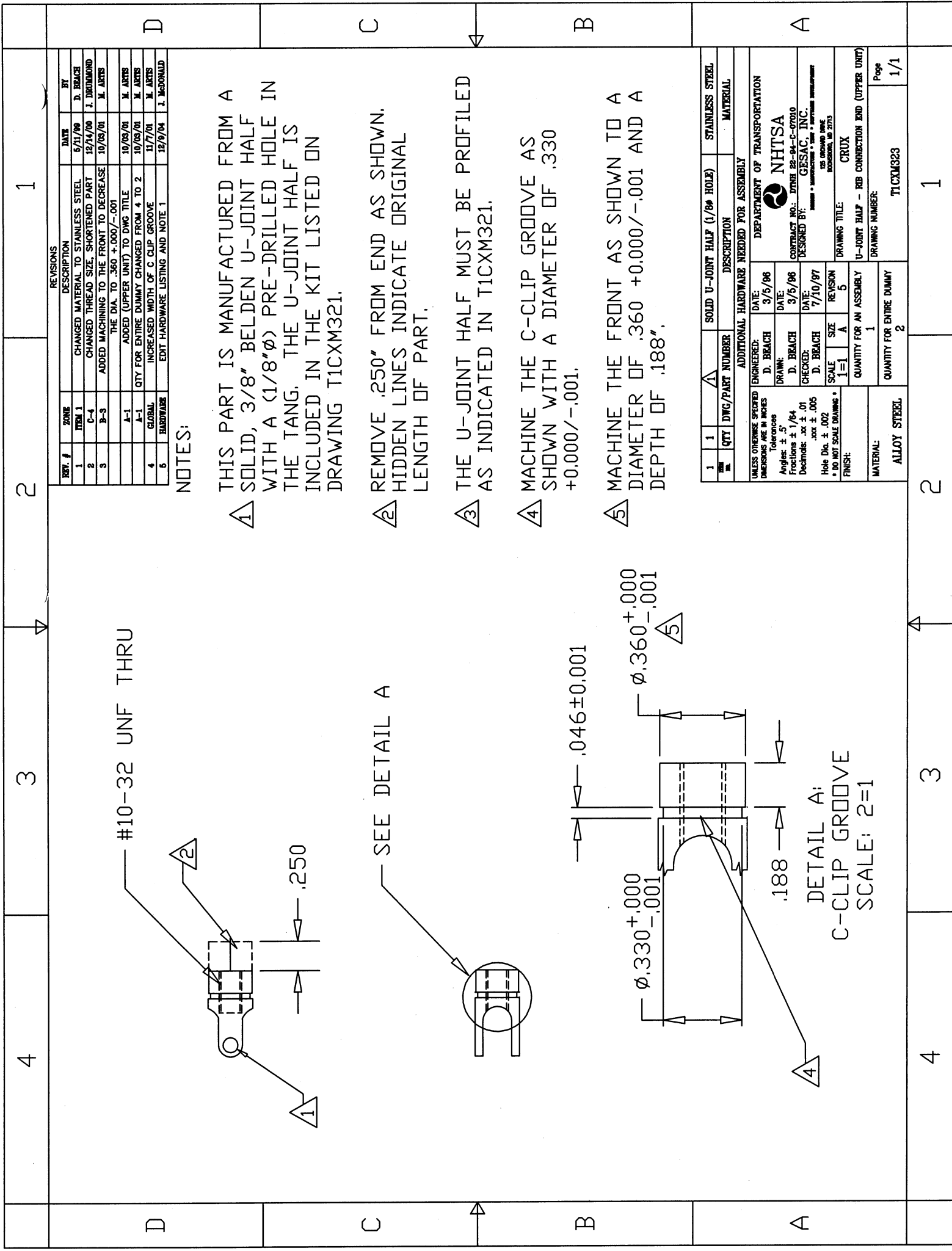


QTY	DWG/PART NUMBER	DESCRIPTION	S.S.	MATERIAL
1	A	SOLID U-JOINT HALF (1/16" HOLE)		

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES	
ENGINEERED:	DATE: 3/5/96
D. BEACH	
DRAWN:	DATE: 3/5/96
D. BEACH	
CHECKED:	DATE: 7/10/97
D. BEACH	
SCALE:	SIZE: REVISION
1=1	A 3
Hole Dia. ± .002	
• DO NOT SCALE DRAWING •	
FINISH:	

ADDITIONAL HARDWARE NEEDED FOR ASSEMBLY	
QUANTITY FOR AN ASSEMBLY	1
QUANTITY FOR ENTIRE DUMMY	4

DEPARTMENT OF TRANSPORTATION	NHTSA
CONTRACT NO.: DTMB 22-94-C-07010	DESIGNED BY: GESAC, INC.
125 ORCHARD DRIVE BOSTON, MA 02133	
DRAWING TITLE:	CRUX
U-JOINT HALF - ROTATION END	DRAWING NUMBER: TICXM322
Page	1/1



REV. #	ZONE	DESCRIPTION	DATE	BY
1		CHANGED MATERIAL TO STAINLESS STEEL	5/11/99	D. BEACH
2		CHANGED THREAD SIZE, SHORTENED PART	12/14/00	J. DRUMMOND
3		ADDED MACHINING TO THE FRONT TO DECREASE THE DIA. TO .360 +.000/-.001	10/09/01	M. ARTS
		ADDED (UPPER UNIT) TO DWG TITLE	10/09/01	M. ARTS
		QTY FOR ENTIRE DUMMY CHANGED FROM 4 TO 2	10/09/01	M. ARTS
4	GLOBAL	INCREASED WIDTH OF C CLIP GROOVE	11/7/01	M. ARTS
6	HARDWARE	EDT HARDWARE LISTING AND NOTE 1	12/9/04	J. McDONALD

NOTES:

- 1 THIS PART IS MANUFACTURED FROM A SOLID, 3/8" BELDEN U-JOINT HALF WITH A (1/8"Ø) PRE-DRILLED HOLE IN THE TANG. THE U-JOINT HALF IS INCLUDED IN THE KIT LISTED ON DRAWING TICXM321.
- 2 REMOVE .250" FROM END AS SHOWN. HIDDEN LINES INDICATE ORIGINAL LENGTH OF PART.
- 3 THE U-JOINT HALF MUST BE PROFILED AS INDICATED IN TICXM321.
- 4 MACHINE THE C-CLIP GROOVE AS SHOWN WITH A DIAMETER OF .330 +.000/-.001.
- 5 MACHINE THE FRONT AS SHOWN TO A DIAMETER OF .360 +.000/-.001 AND A DEPTH OF .188".

QTY	DWG/PART NUMBER	DESCRIPTION	MATERIAL
1	1	SOLID U-JOINT HALF (1/8" HOLE)	STAINLESS STEEL

UNLESS OTHERWISE SPECIFIED:	
ENGINEERED:	D. BEACH 3/5/96
DRAWN:	D. BEACH 3/5/96
CHECKED:	D. BEACH 7/10/97
SCALE:	1=1 A
SIZE:	A
REVISION:	5

QUANTITY FOR AN ASSEMBLY	
1	QUANTITY FOR ENTIRE DUMMY
2	QUANTITY FOR ENTIRE DUMMY

MATERIAL:	
1	ALLOY STEEL
2	ALLOY STEEL

ADDITIONAL HARDWARE NEEDED FOR ASSEMBLY	
DATE:	3/5/96
DEPARTMENT:	DEPARTMENT OF TRANSPORTATION
CONTRACT NO.:	DTNIE 22-94-C-07010
DESIGNED BY:	GESAC, INC.
125 NEWCASTLE BLVD ROCKVILLE, MD 20850	
DRAWING TITLE:	CRUX
U-JOINT HALF - RB CONNECTION END (UPPER UNIT)	
DRAWING NUMBER:	TICXM323
Page	1/1

DETAIL A:
C-CLIP GROOVE
SCALE: 2=1

1

2

3

4

REVISIONS			
REV. #	ZONE	DESCRIPTION	DATE
1	GLOBAL	INCREASED WIDTH OF C CLIP GROOVE	11/7/01
2	HARDWARE	EDIT HARDWARE LISTING AND NOTE 1	12/9/04
3	GLOBAL	INCREASE LENGTH OF MACHINED PART BY .125	1/27/06

#10-32 UNF THRU

NOTES:

1 THIS PART IS MANUFACTURED FROM A SOLID, 3/8" BELDEN U-JOINT HALF WITH A (1/8"Ø) PRE-DRILLED HOLE IN THE TANG. THE U-JOINT HALF IS INCLUDED IN THE KIT LISTED ON DRAWING T1CXM321.

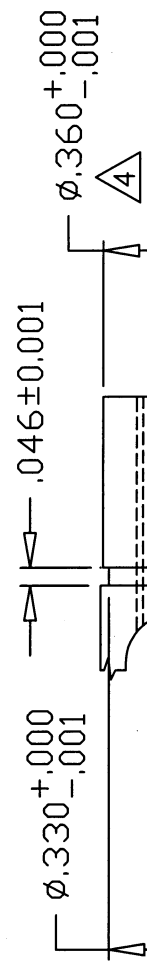
2 THE U-JOINT HALF MUST BE PROFILED AS INDICATED IN T1CXM321.

3 MACHINE THE C-CLIP GROOVE AS SHOWN WITH A DIAMETER OF .330 +.000/- .001.

4 MACHINE THE FRONT AS SHOWN TO A DIAMETER OF .360 +0.000/- .001 AND A DEPTH OF .441".

.937 (STOCK LENGTH)

SEE DETAIL A



DETAIL A:
C-CLIP GROOVE
SCALE: 2=1

D

C

B

A

REV. #	QTY	DWG/PART NUMBER	DESCRIPTION	MATERIAL
1	1	A	SOLID U-JOINT HALF (1/8" HOLE)	STAINLESS STEEL

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES	
ENGINEERED:	D. BEACH
DATE:	3/5/06
DRAWN:	D. BEACH
DATE:	3/5/06
CHECKED:	M. ARTIS
DATE:	10/08/01
Hole Dia. ± .002	SCALE 1=1
± .001	SIZE A
± .005	REVISION 3
± .01	QUANTITY FOR AN ASSEMBLY 1
± .01	QUANTITY FOR ENTIRE DUMMY 2

ADDITIONAL HARDWARE NEEDED FOR ASSEMBLY	
DEPARTMENT OF TRANSPORTATION	
NHTSA	
CONTRACT NO.: DTMB 22-94-C-07010	
DESIGNED BY: GBSAC, INC.	
12500 WOODBURN BLVD	
GREENSBORO, NC 27409	
DRAWING TITLE: CRUX	
U-JOINT HALF - RB CONNECTION END (LOWER UNIT)	
DRAWING NUMBER: T1CXM324	
Page: 1/1	

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D

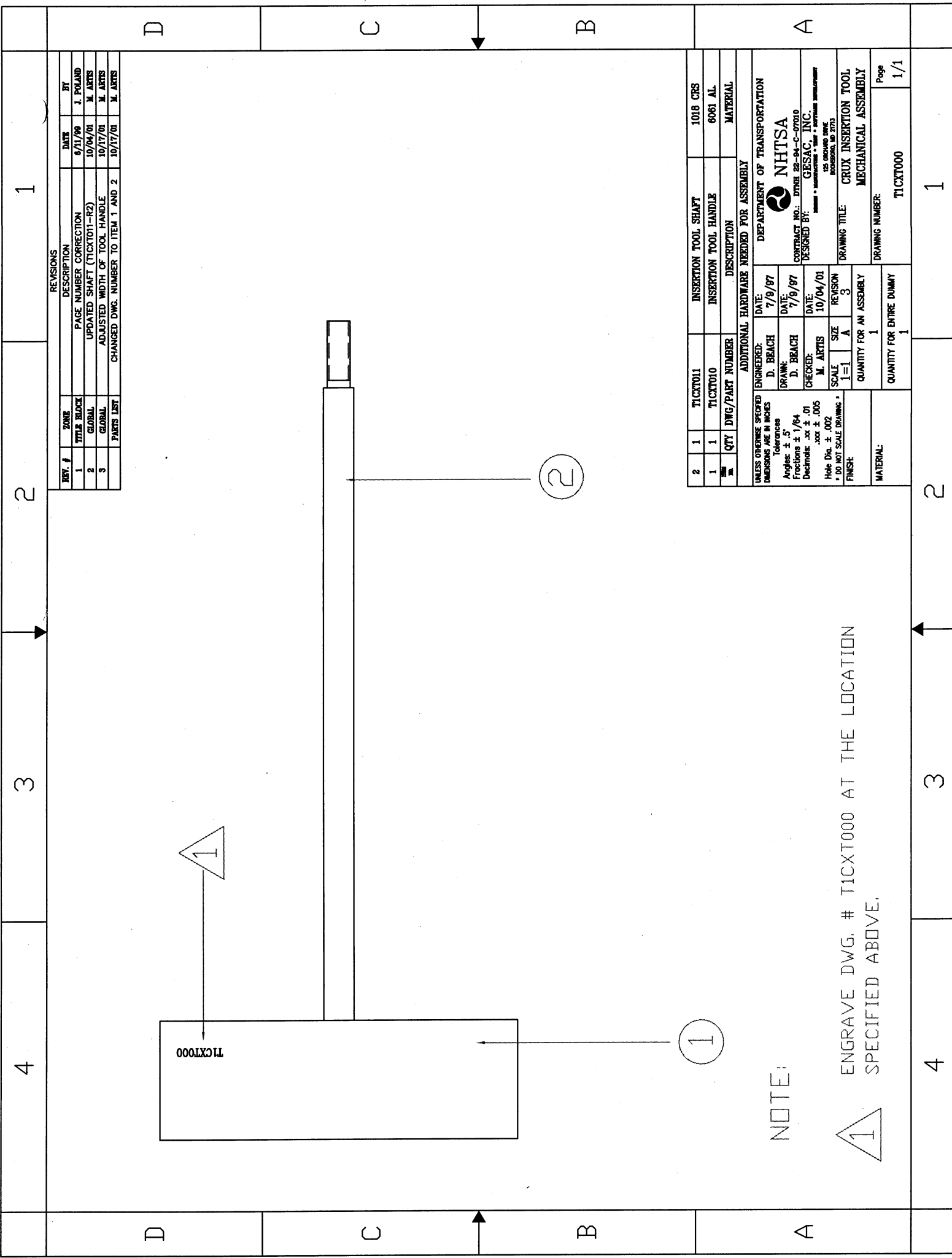
C

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8	7	6	5	4	3	2	1																																																																																
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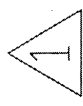


REVISIONS				
REV. #	ZONE	DESCRIPTION	DATE	BY
1	GLOBAL	PAGE NUMBER CORRECTION	9/11/99	J. POLAND
2	GLOBAL	UPDATED SHAFT (TICKT01-R2)	10/04/01	M. ARTIS
3	GLOBAL	ADJUSTED WIDTH OF TOOL HANDLE	10/17/01	M. ARTIS
	PARTS LIST	CHANGED DWG. NUMBER TO ITEM 1 AND 2	10/17/01	M. ARTIS

2	1	TICKT011	INSERTION TOOL SHAFT	1018 CRS	
1	1	TICKT010	INSERTION TOOL HANDLE	6061 AL	
		QTY	DWG/PART NUMBER	DESCRIPTION	MATERIAL
ADDITIONAL HARDWARE NEEDED FOR ASSEMBLY					
UNLESS OTHERWISE SPECIFIED		ENGINEERED:	D. BEACH	DATE:	7/9/97
DIMENSIONS ARE IN INCHES		DRAWN:	D. BEACH	DATE:	7/9/97
Tolerances		CHECKED:	M. ARTIS	DATE:	10/04/01
Angles: ± .5°		SCALE	1=1	SIZE	A
Fractions ± 1/64		REVISION	3	QUANTITY FOR AN ASSEMBLY	1
Decimals: .xx ± .01				QUANTITY FOR ENTIRE DUMMY	1
.xxx ± .005					
Hole Dia. ± .002					
* DO NOT SCALE DRAWING *					
FINISH:					
MATERIAL:					

NOTE:

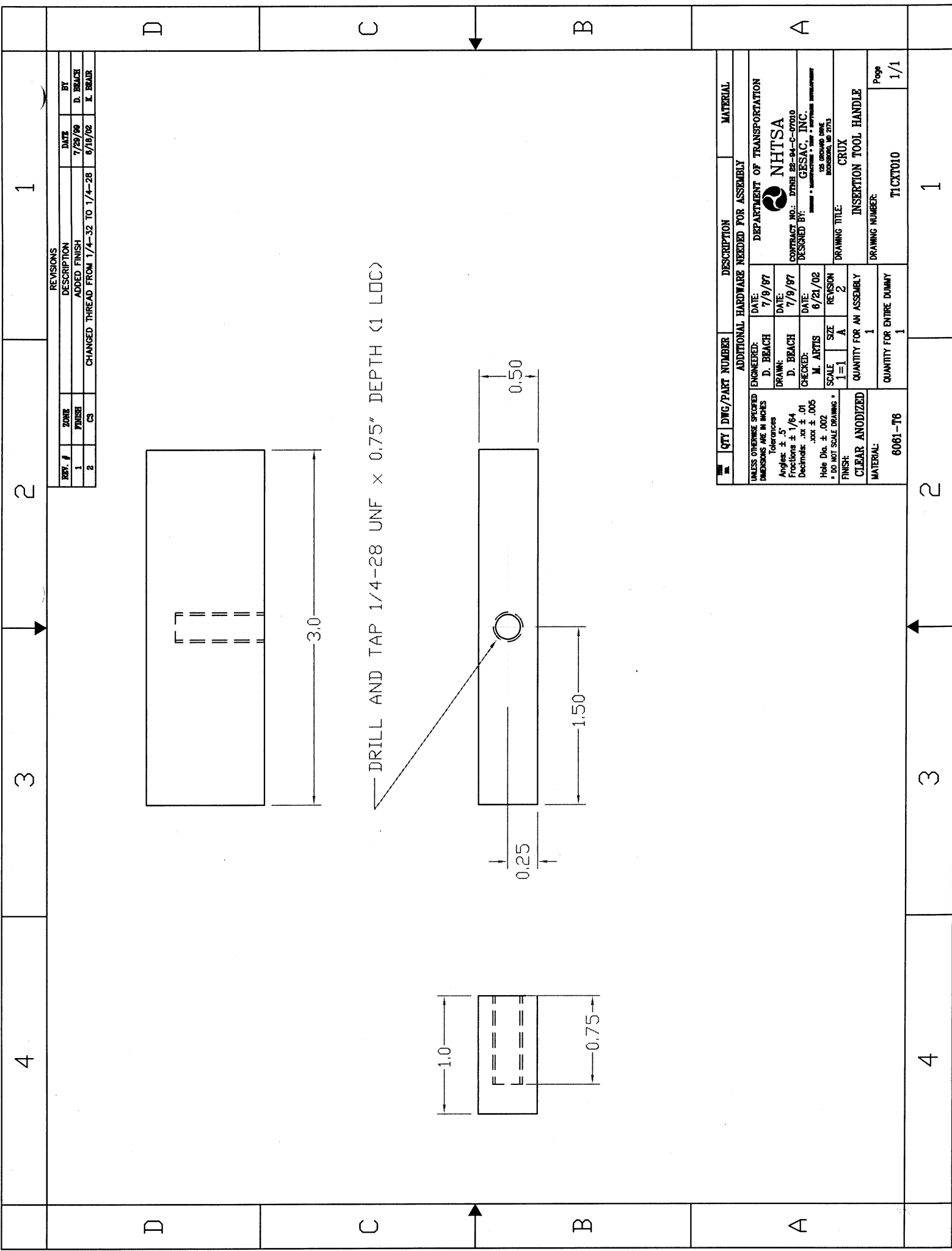
ENGRAVE DWG. # TICKT000 AT THE LOCATION SPECIFIED ABOVE.



TICKT000

DEPARTMENT OF TRANSPORTATION
NHTSA
 CONTRACT NO.: DTMB 22-94-C-07010
 DESIGNED BY: GESAC, INC.
125 ROCKAWAY DRIVE
 ROCKFORD, IL 61153

DRAWING TITLE: CRUX INSERTION TOOL
 MECHANICAL ASSEMBLY
 DRAWING NUMBER: TICKT000
 Page 1/1



DRILL AND TAP 1/4-28 UNF x 0.75" DEPTH (1 LOC)

REV. #		ZONE	DESCRIPTION	DATE	BY
1	CS	FINISH	ADDED FINISH	7/28/99	D. BEACH
2	CS		CHANGED THREAD FROM 1/4-32 TO 1/4-28	9/18/02	I. BEAUR

QTY	DWG/PART NUMBER	DESCRIPTION	MATERIAL
1	6061-T6	INSERTION TOOL HANDLE	CRUX
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES Tolerances Angles: ± 3° Fractions: ± 1/64 Decimals: .xx ± .01 .xxx ± .005 Hole Dia. ± .002 * DO NOT SCALE DRAWING * FINISH: CLEAR ANODIZED			
ADDITIONAL HARDWARE NEEDED FOR ASSEMBLY ENGINEERED: D. BEACH DATE: 7/9/97 DRAWN: D. BEACH DATE: 7/9/97 CHECKED: M. ARTIS DATE: 6/21/02 SCALE: SIZE A 1=1 QUANTITY FOR AN ASSEMBLY: 1 QUANTITY FOR ENTIRE DUMMY: 1			
DEPARTMENT OF TRANSPORTATION NHTSA CONTRACT NO.: DTMB 98-94-C-0700 DESIGNED BY: GESAC, INC. <small>DESIGN • MANUFACTURE • TEST • SUPPORT • MAINTENANCE</small> DRAWING TITLE: INSERTION TOOL HANDLE DRAWING NUMBER: T1CXT010 Page: 1/1			

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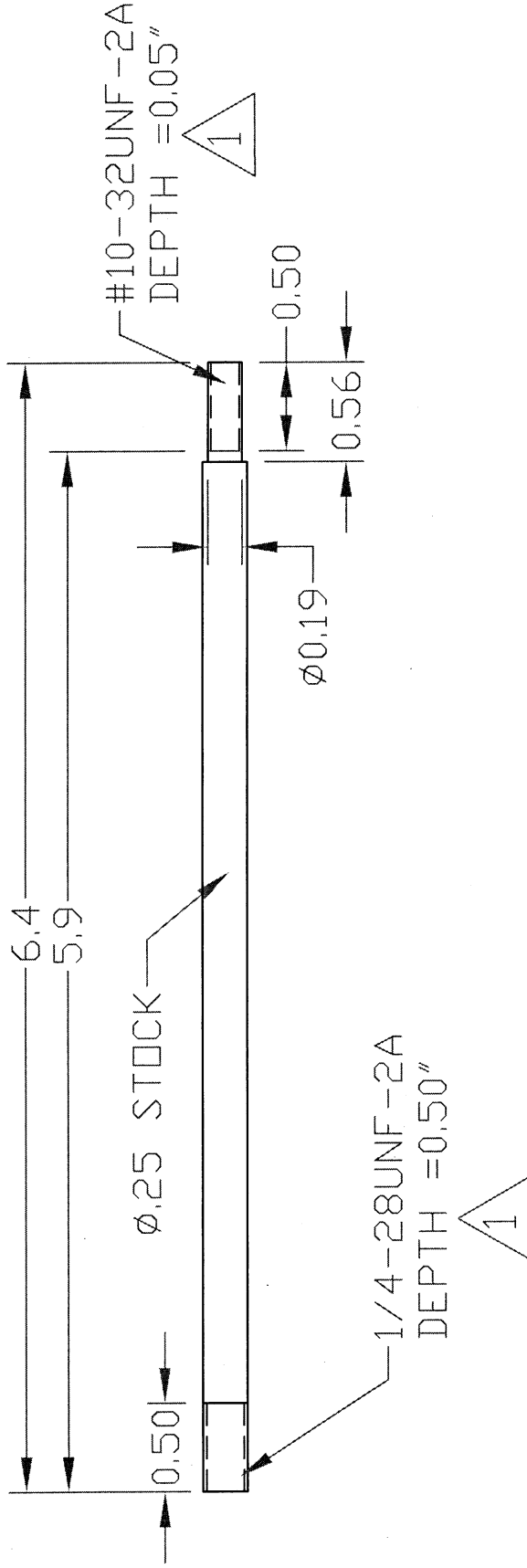
REVISIONS		
REV. #	ZONE	DESCRIPTION
1	B-3	CHANGED DIMENSION TEXT
2	GLOBAL	DECREASED LENGTH AND CHANGED THREADS ON 1 SIDE ADDED COATING

D

C

B

A



NOTE:

MASK THE THREADS BEFORE APPLYING TEFLON COATING.



QTY	DWG/PART NUMBER	DESCRIPTION	MATERIAL
1	1018 CRS	TEFLON COATING	1018 CRS
1	1	QUANTITY FOR AN ASSEMBLY	CRUX
1	1	QUANTITY FOR ENTIRE DUMMY	INSERTION TOOL SHAFT
1	1	QUANTITY FOR ENTIRE DUMMY	TICKT011

ADDITIONAL HARDWARE NEEDED FOR ASSEMBLY	
ENGINEERED:	DATE: 7/9/97
D. BEACH	DATE: 10/04/01
DRAWN:	DATE: 10/04/01
M. ARTIS	DATE: 10/04/01
CHECKED:	DATE: 10/04/01
M. ARTIS	DATE: 10/04/01
SCALE:	SIZE: A
1=1	REVISION: 2

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES	
Tolerances	
Angles	± 5'
Fractions	± 1/64
Decimals	.xxx ± .01
Decimals	.xxxx ± .005
Hole Dia.	± .002
* DO NOT SCALE DRAWING *	
FINISH: TEFLON COATING	

DEPARTMENT OF TRANSPORTATION	
NHTSA	
CONTRACT NO.: DTMB 85-94-C-07010	
DESIGNED BY: GESAC, INC.	
10500 ROCKHILL ROAD, SUITE 100 ROCKHILL, MD 2773	
DRAWING TITLE: CRUX	
INSERTION TOOL SHAFT	
DRAWING NUMBER:	TICKT011
Page	1/1

1

2

3

4