

	SURFACE VEHICLE RECOMMENDED PRACTICE	SAE J577 JUN2011
		Issued 1940-01 Reaffirmed 2011-06
		Superseding J577 JUL2005
Vibration Test Machine and Operation Procedure		

RATIONALE

J577 has been reaffirmed to comply with the SAE 5-Year Review policy.

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1. Scope

This SAE Recommended Practice provides procedures, and information to conduct vibration (impact) tests on lighting devices and their components as well as other safety equipment used on vehicles.

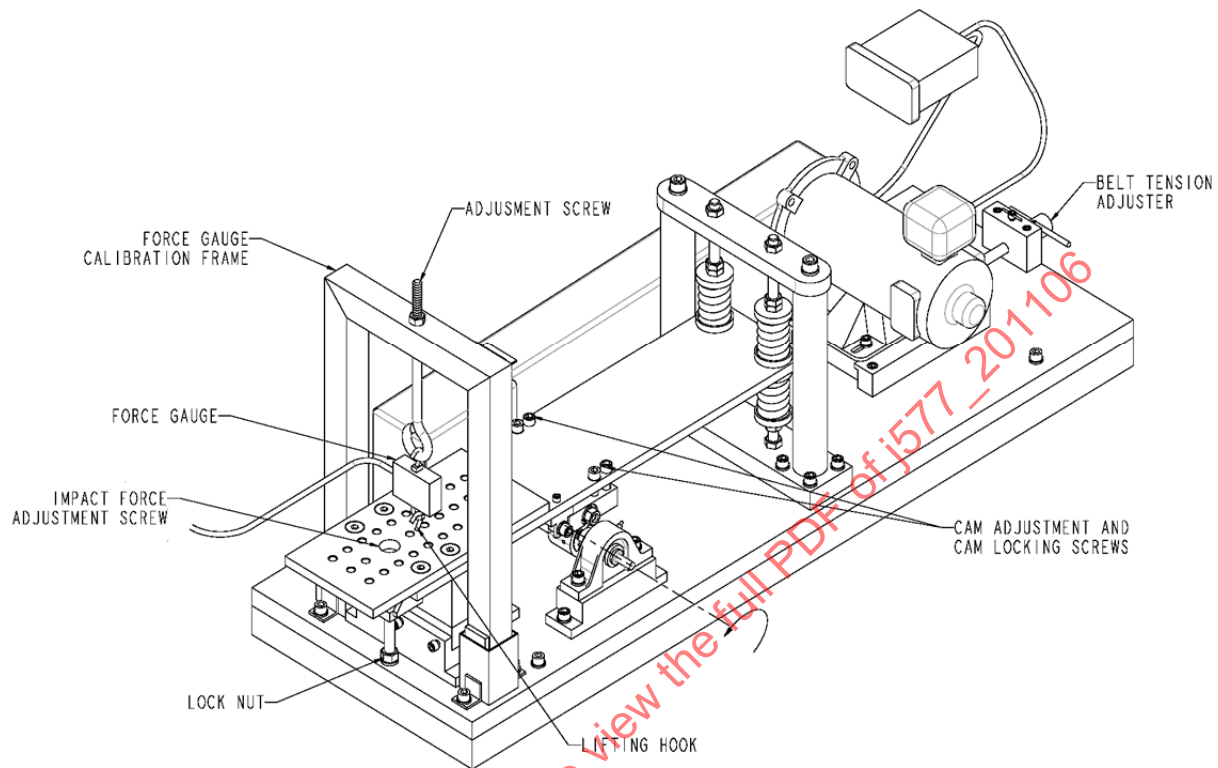


FIGURE 1—VIBRATION TEST MACHINE

2. References

2.1 Related Publications

2.1.1 SAE PUBLICATIONS

Available from SAE, 400 Commonwealth Drive, Warrendale, PA 15096-0001.

SAE J575—Tests for Motor Vehicle Lighting Devices and Components

SAE J2139—Tests for Lighting Devices, Reflective Devices and Components Used on Vehicles
2032 mm or more in Overall Width

SAE 861957—Headlight Vibration Testing for Heavy Duty Trucks

SAE 840501—Automotive Component Vibration: A Practical Approach to Accelerated Vibration Durability
Testing

SAE 790747—Vibration Test for Motor Vehicle Lighting Devices and Components

2.1.2 FMVSS PUBLICATIONS

Available from the National Highway Traffic Safety Administration, 400 Seventh SW, Washington, DC
20024-0002.

FMVSS-108—Lamps Reflective Devices, And Associated Equipment (Available as 49 CFR 571.108)

2.1.3 OTHER PUBLICATIONS

U.S. Department of Agriculture General Technical Report FPL 22—An Assessment of the Common
Carrier Shipping Environment

3. Definitions

3.1 Anvil

The member located at the front of the machine on the lower base plate, that is struck by the hammer
when the top plate is falling.

3.2 Cam Follower

A mechanism that contains a roller(s) that comes in contact with the cam(s) surface and thereby reduces
the friction and wear on the cam by rotating rather than rubbing.

3.3 Hammer

The member located at the front of the machine on the upper plate, that strikes the anvil when the top
plate is falling.

3.4 Vibration Test Fixture

A fixture specifically designed to support the device under test in its designed operating position during the vibration test.

4. Lighting Identification Code

Not applicable.

5. Tests

5.1 Calibration Equipment and Instrumentation

Equipment listed is a guide for standardization only. Equivalent instrumentation equipment is available, however test results should be checked for accuracy

5.1.1 FORCE GAGE

5.1.1.1 Force/Torque Indicator with 50 x 0.02 kgf Capacity, 500 x 0.2 N, accuracy $\pm 0.2\%$ of full scale ± 1 digit.

5.1.1.2 Force Sensor with 50 x 0.02 kgf Capacity, accuracy $\pm 0.15\%$ of full scale ± 1 digit.

5.1.2 GO-NO-GO GAGES

5.1.2.1 Gages specified in Figures 2, 3, and 4 below should be used to set the machine up and for recalibration.

5.2 Vibration Test

This test evaluates the ability of a device to resist damage from vibration-induced (impact-induced) stresses.

5.3 Vibration Test Procedures

5.3.1 A sample of the device, mounted in the specified vibration test fixture shall be bolted to the anvil end of the table on the vibration test machine and vibrated at $12.5 \pm .17$ Hz (750 ± 10 cpm) through a vertical distance of $3.2 \text{ mm} \pm .25 \text{ mm}$. The table shall be spring mounted at one end and fitted with a steel hammer on the underside of the other end. The hammer shall contact the steel anvil once during each cycle at the completion of the fall. The impact force shall be $290 \text{ N} \pm 20 \text{ N}$.

6. Vibration Machine Requirements

6.1 The vibration system shall consist of a vibration machine and the mounting base.

6.2 The machine shall meet the specifications as outlined in drawing number 251942, which may be purchased from SAE Headquarters.

NOTE—Deviation from the specifications as listed could compromise the performance of the vibration test.

- 6.3** The mounting base for the machine shall meet the specifications as outlined in drawing number 230050, which may be purchased from SAE Headquarters.

7. Machine Set-Up and Calibration

The vibration isolator system on the mounting base should be pressurized to a minimum of 275.6 kPa.

7.1 Calibration and Instrumentation Sequence

- a. Vee block rollers
- b. Rear spring set-up
- c. Verify top plate is parallel to machine base plate.
- d. Adjust hammer and anvil gap
- e. Adjust top plate spring tension
- f. Program cycles per minute into the controller

7.2 Vee Block Roller Adjustment

- 7.2.1 Remove the fixture mounting plate mounted on top of the top plate to access the two mounting screws holding the vee block in place.
- 7.2.2 Place a 0.25 mm gage or shim stock between each roller and the vee block as shown in Figure 5. Position the vee block so that it makes contact with the shim stock on both rollers.
- 7.2.3 Tighten the two mounting bolts for the vee block and replace the fixture plate.
- 7.2.4 Remove the gages or shim stock(s).

7.3 Rear Spring Set-Up

- 7.3.1 The lifting cams should be rotated to their lowest point (not engaged). Rotate the cams counterclockwise, when viewed from the pulley side, until they touch the cam followers. The hammer and anvil must be touching.
- 7.3.2 Measure the height of the top plate from the machine's bottom plate using the "GO-NO-GO" gage shown in Figure 2. The measurement should be made at the front (both sides) to make sure it is at the proper height, then measure the rear of the top plate (both sides) to make sure they are at the same height. If the rear of the top plate is higher or lower than the front, adjust the rear springs until the gage fits both front and rear.
- 7.3.3 Use the "GO-NO-GO" gage per Figure 3 to gage the correct spring compression to obtain the force required. The gage should "go" over the spring keeper and interfere with the "NO-GO" portion of the gage. The spring force is determined by the spring rate to determine the amount of compression plus the wall thickness of the two spring keepers.

- 7.3.4 Recheck the height of the top plate using the “GO-NO-GO” gage from Figure 2 to make sure it is the same as the front (both sides).
- 7.3.5 Place a piece of manila folder between the hammer and anvil and run the machine for 60 seconds. Check the imprint on the manila paper to make sure the hammer and anvil are making contact over the entire surface. If they are not making even contact from side to side and front to back it is recommended that the hammer and anvil and holder assembly be surface ground. After grinding repeat the manila paper imprint test. Caution should be taken not to grind too much off the hammer and anvil so that the top plate is no longer level. It is recommended that no shims be used under the hammer or the anvil as this can cause dampening of the machine. Replace a worn anvil.

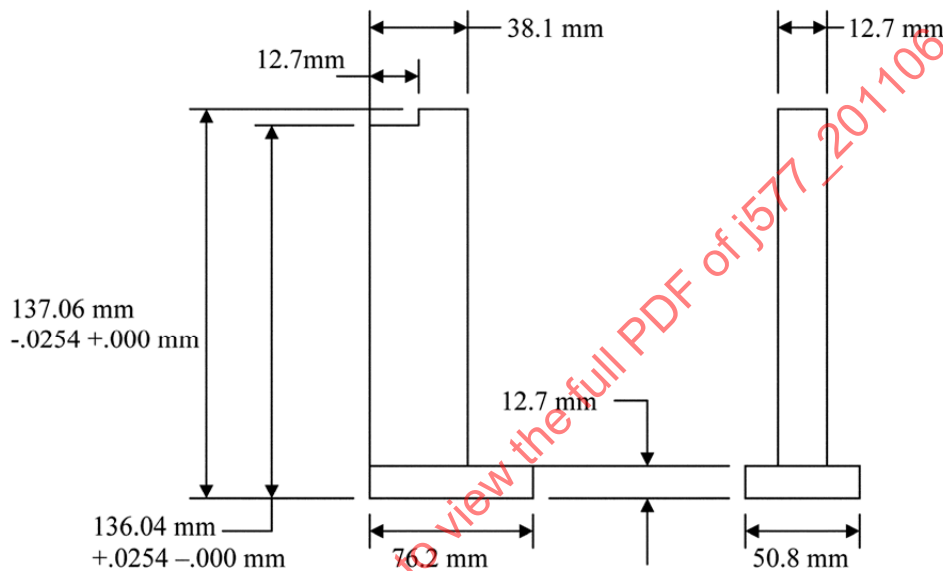


FIGURE 2—TOP PLATE GAGE

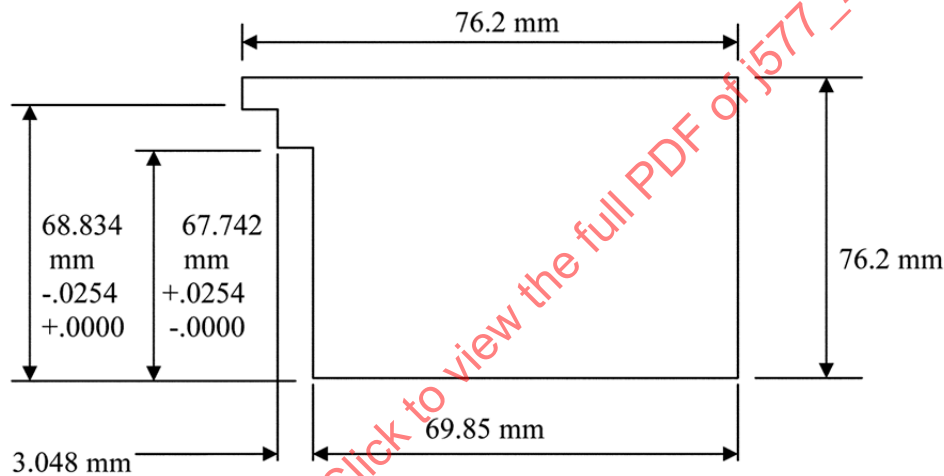
7.4 Calibration Procedure

7.4.1 CAM SET-UP

- 7.4.1.1 Care should be taken to assemble the cams on the machine correctly. When viewing the cams from the pulley side of the machine, the cams should rotate clockwise.
- 7.4.1.2 Manually rotate the cams to Top-Dead-Center (TDC). This will provide the largest gap between the hammer and anvil.
- 7.4.1.3 Check the gap using the “GO-NO-GO” gage in Figure 4. Adjust the cantilevered cam followers until the “GO” portion of the gage fits between the hammer and anvil.

7.4.2 SPRING FORCE CALIBRATION

- 7.4.2.1 Rotate the cam from TDC backwards until the highest point on the cam stops at the cam follower. This is the lowest point on the cam and the hammer should be touching the anvil.
- 7.4.2.2 Place the calibration frame in the receptacles as shown on the drawings referenced in 6.2. Install the lifting hook in the accelerometer-mounting hole in the fixture mounting plate directly over the center of the anvil.
- 7.4.2.3 Attach the force gage specified in 5.1.1 to the calibration frame and attach it to the hook installed in the accelerometer-mounting hole on the fixture plate. Tighten the screw on top of the calibration frame until the gap between the hammer and anvil fits the "GO-NO-GO" gage in Figure 4.
- 7.4.2.4 Adjust the socket head capscrew for the front compression spring through the hole in the fixture plate until the calibration gage has a reading between $290\text{ N} \pm 20\text{ N}$.



Recommended width of the gage is 25.4 mm.

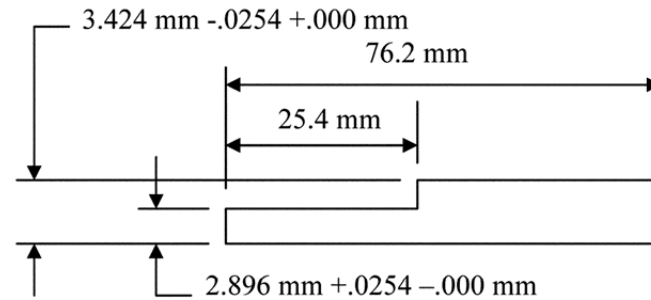
FIGURE 3—REAR SPRING GAGE

7.4.3 MACHINE CYCLE CALIBRATION

- 7.4.3.1 Set the controller at 750 cycles per minute.

8. Test Fixture Design

- 8.1 The combined weight of the fixture plate, the DUT, and the fixture shall be a minimum of 13.5 kg and a maximum of 27.0 kg.
- 8.2 The center of gravity of the fixture and the DUT should be centered as near as practicable over the anvil.



Recommended width of the gage is 25.4 mm.

FIGURE 4—GAP GAGE

9. Guidelines

9.1 Preventive Maintenance and Re-calibration

- 9.1.1 Calibration of the machine should be checked after 150 hours of tests or per the companies re-calibration schedule, which ever is less . Repair or replacement of worn machine components requires recalibration.
- 9.1.2 The machine should be inspected before and after each test to see if there is any wear appearing on the components and that all of the springs are functioning properly.
- 9.1.3 The machine should be lubricated on a quarterly basis or per the companies preventive maintenance schedule, which ever is less.

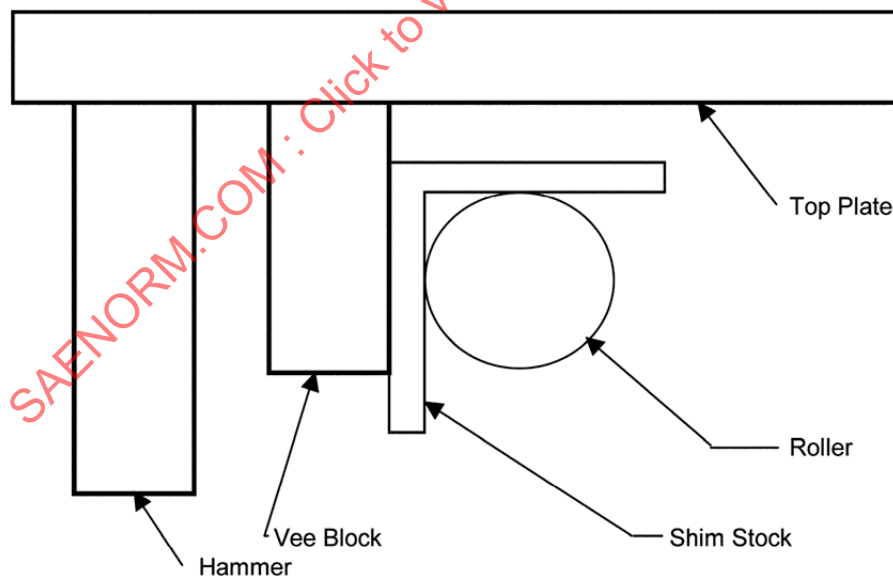


FIGURE 5—VEE BLOCK AND ROLLER SPACING ADJUSTMENT

J577 VIBRATION MACHINE SET-UP FLOW CHART

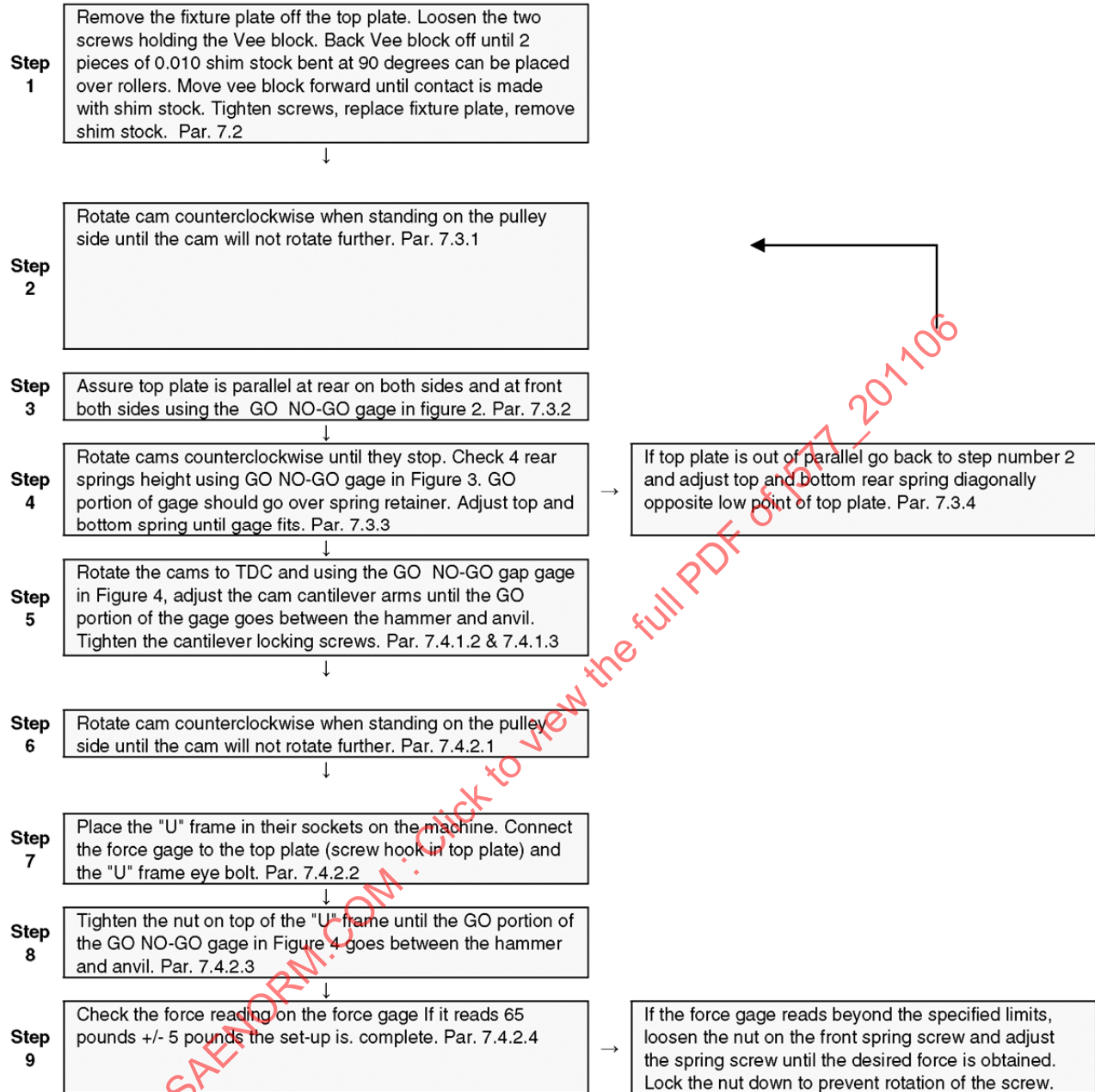
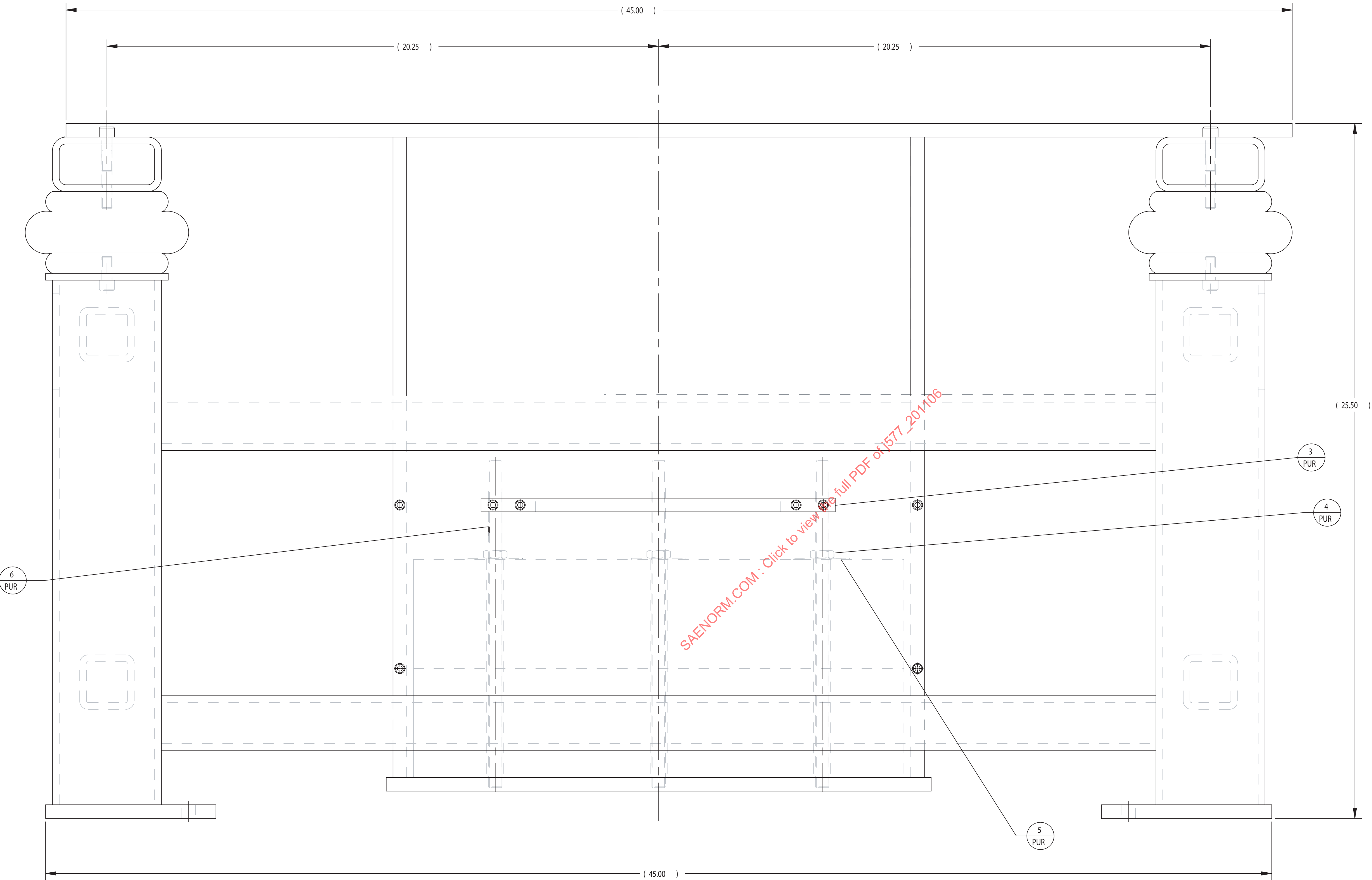


TABLE 1—MOUNTING BASE BILL OF MATERIAL

ITEM	ASY SHT	DTL SHT	QTY	MATERIAL	FINISH SIZE OR NAME
1	2		1	PUR	CARR LANE, SWING BOLT #CL-2-SB
2	2		4	PUR	FIRESTONE, AIRMOUNTS STYLE #16
3	2		1	PUR	McMASTER-CARR, DRAWER & DOOR
					PULLS #187A64
4	2		3	PUR	McMASTER-CARR, HEX THIN (JAM)
					NUT #91847A520
5	2		3	PUR	McMASTER-CARR, LARGE O.D. FLAT
					WASHER #91090A118
6	2		3	PUR & ALT	McMASTER-CARR, THREADED ROD
					#98847A033
7	3	5	1	WELDMENT	BASE WELDMENT ASSEMBLY
8	3	6	1	WELDMENT	MOUNTING PLATE SUB-ASSEMBLY
9	3	7	2	STEEL TUBE	MOUNTING PLATE CROSSMEMBER
10	3	8	1	1018	WEIGHT RACK COVER
11	3	9	4	1018	WEIGHT
					23050-01

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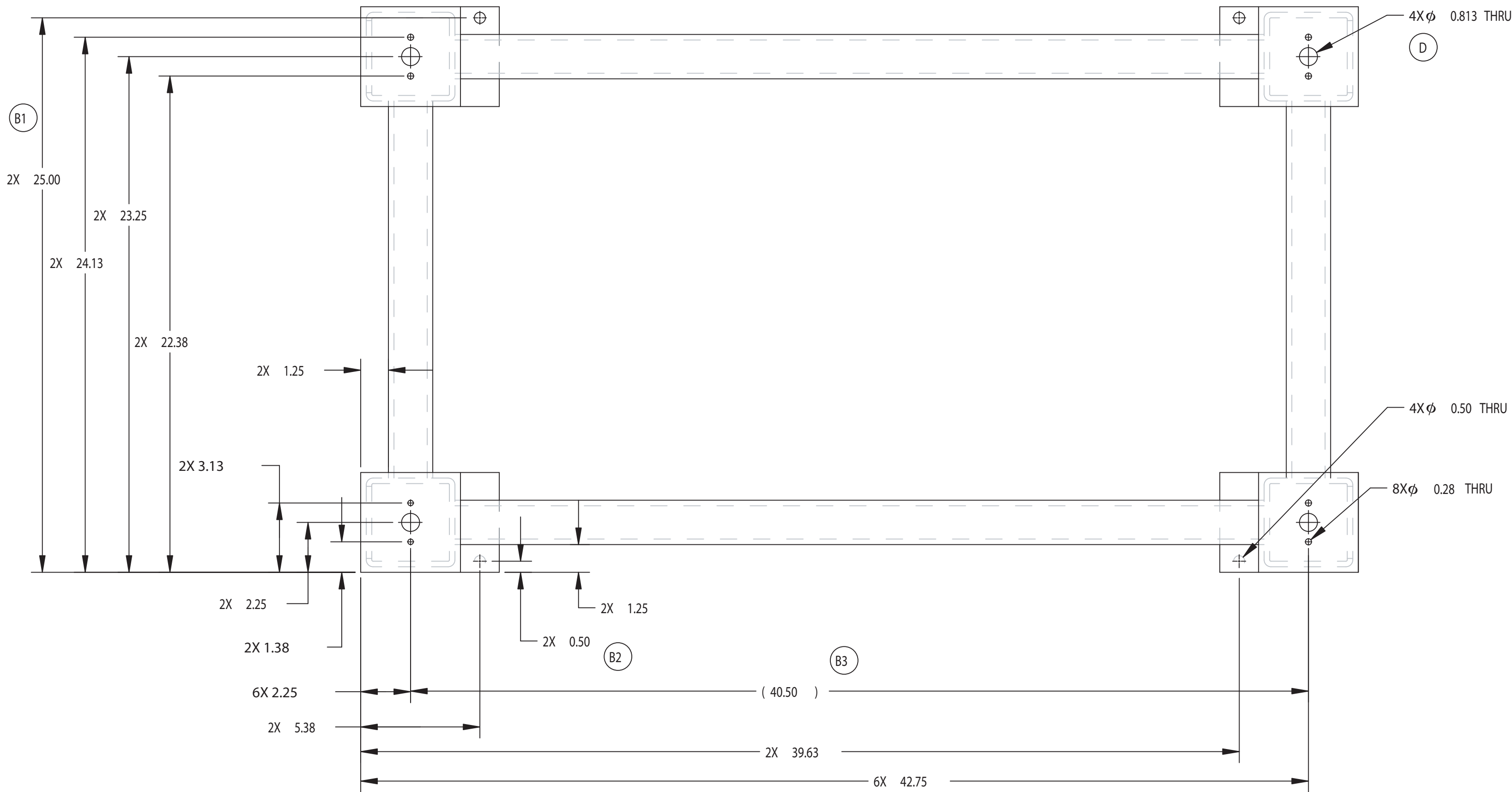


BASE ASSEMBLY

- B** NOTES:
- 1) IT IS RECOMMENDED THAT THE FIRESTONE VIBRATION ISOLATORS BE INTERCONNECTED WITH EACH OTHER USING 1/4" TUBING.
 - 2) THE SYSTEM SHOULD INCLUDE AN AIR INLET VALVE TO PRESSURIZE THE SYSTEM.
 - 3) THE SYSTEM SHOULD BE PRESSURIZED TO 40 PSI.

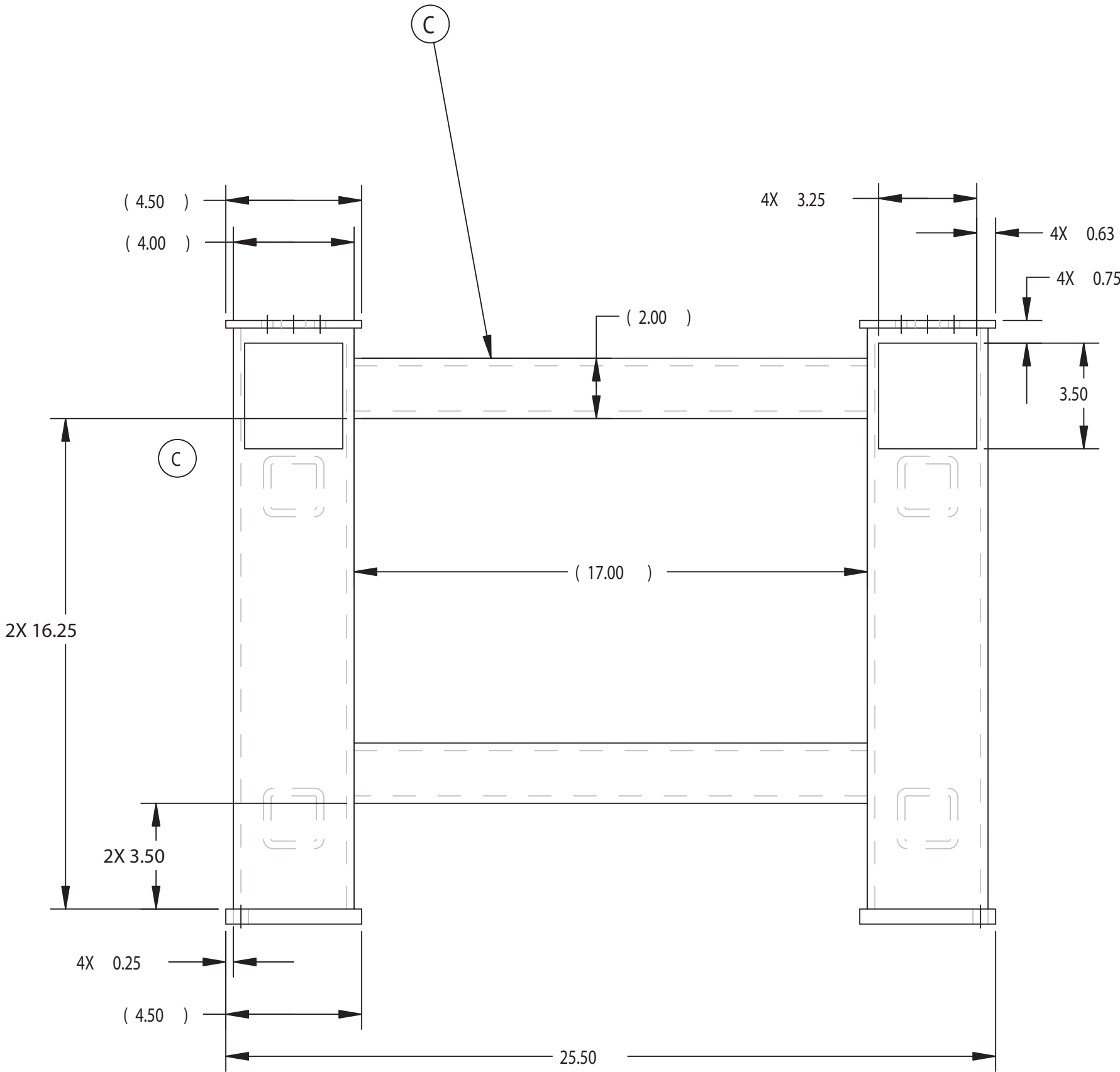
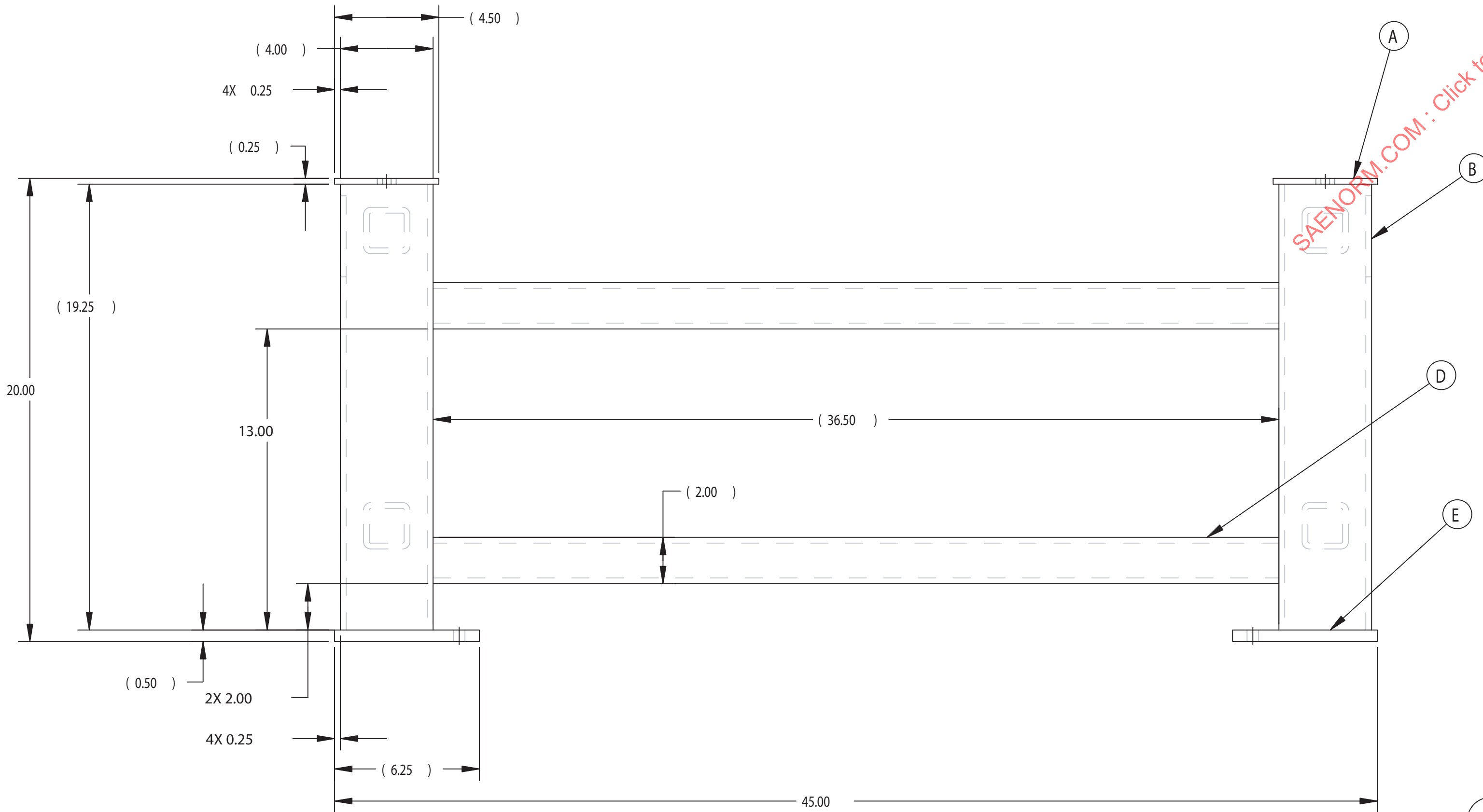
REV		DESCRIPTION	ENG APPL	ECN/ECO NO AND DATE
A MDN	RELEASED			(230050) 11/13/01
B MDN	ADDED NOTES			(230050) 07/08/02

FIGURE 6—MOUNTING BASE ASSEMBLY



BILL OF MATERIAL
FINISHED SIZES GIVEN

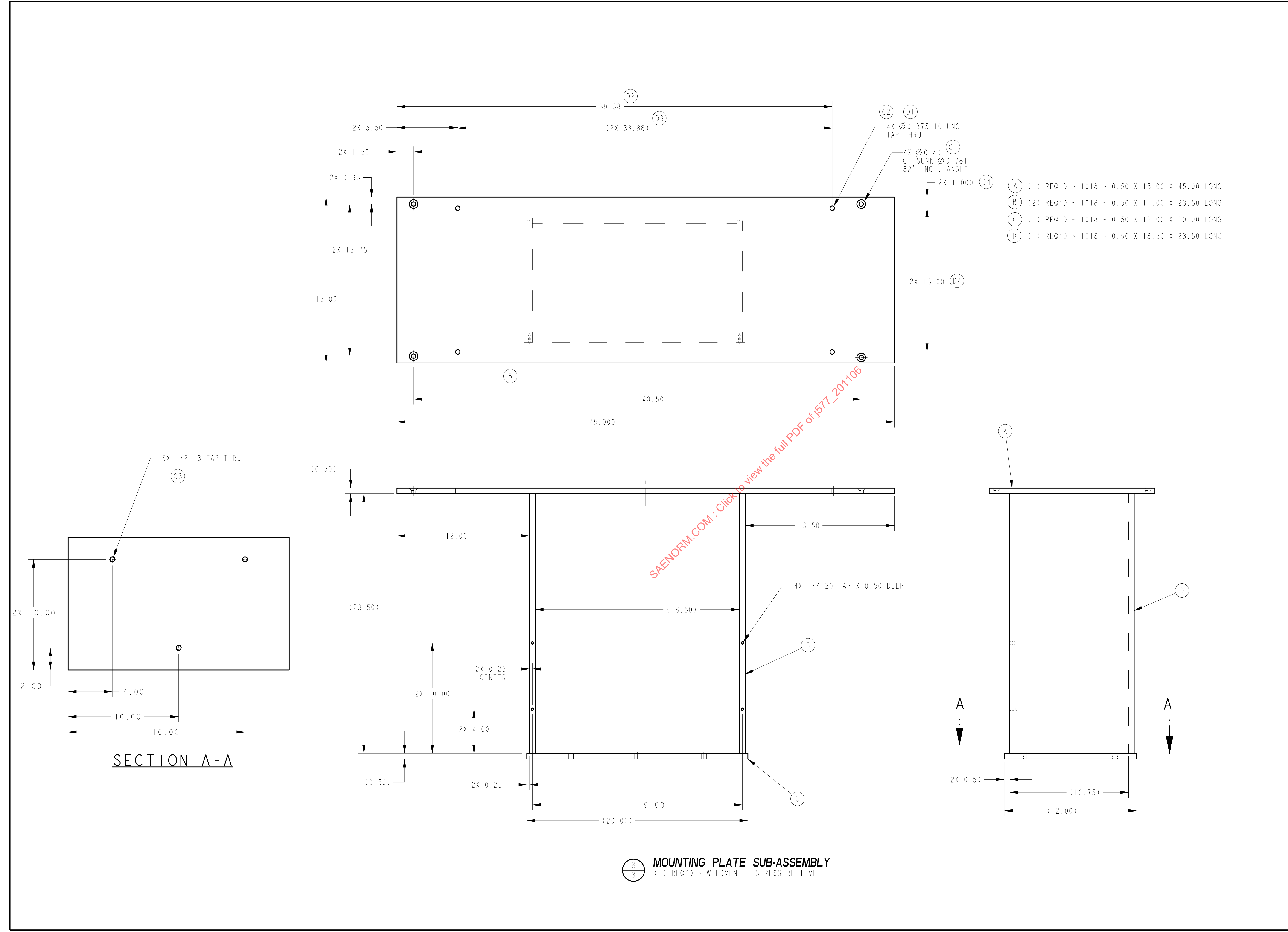
- (4) REQ'D ~ 1018 ~ 0.25 X 4.50 X 4.50 LONG
(4) REQ'D ~ 1018 ~ 4" SQ.TUBING X 0.25 WALL X 19.25 LONG
(4) REQ'D ~ 1018 ~ 2" SQ.TUBING X 0.125 WALL X 17.00 LONG
(4) REQ'D ~ 1018 ~ 2" SQ.TUBING X 0.125 WALL X 37.50 LONG
(4) REQ'D ~ 1018 ~ 0.50 X 4.50 X 6.25 LONG



7
3
BASE WELDMENT
(1) REQ'D ~ STRESS RELIEVE

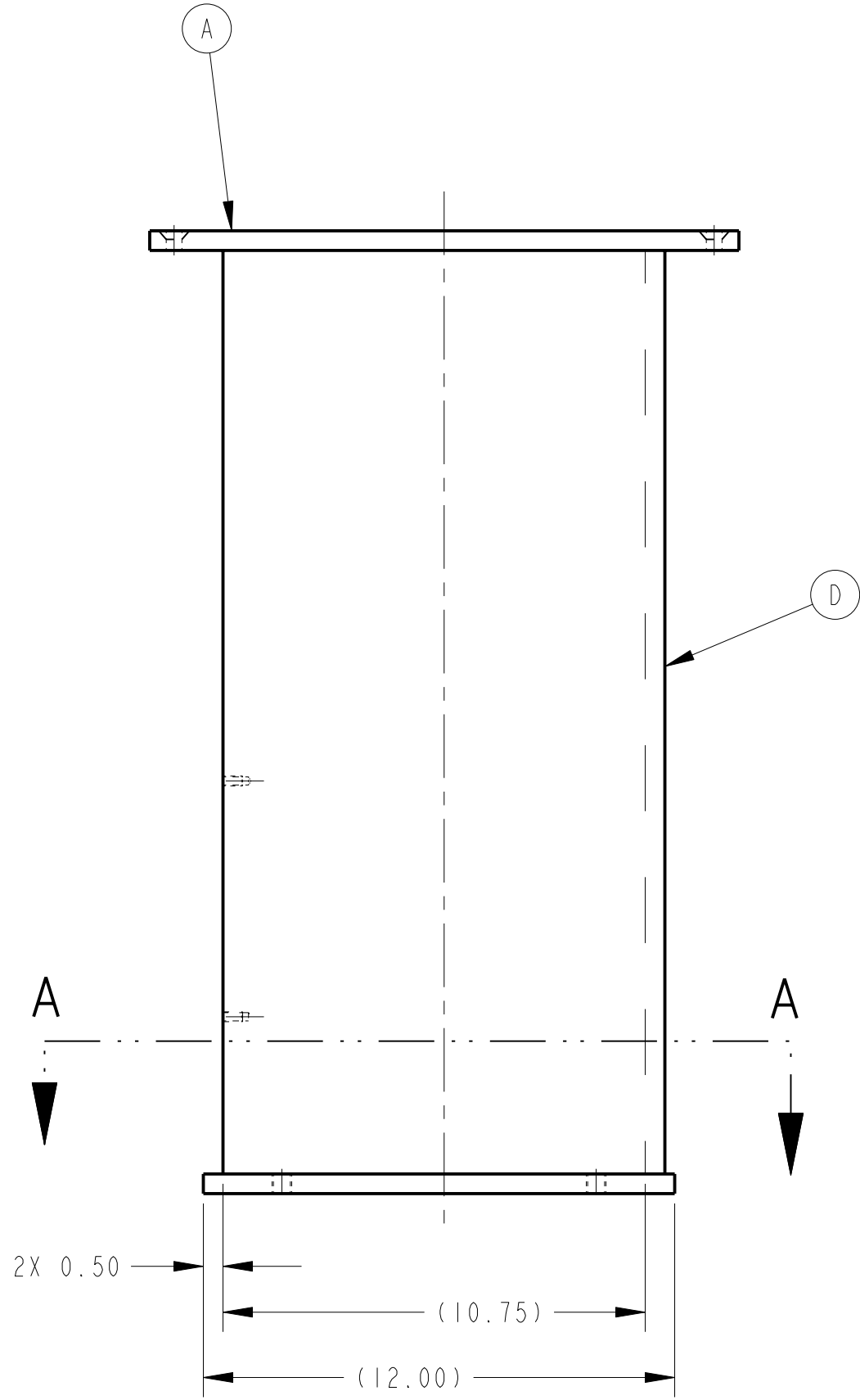
FIGURE 9—BASE WELDMENT

REV	DESCRIPTION	ENG APPL	ECN/ECO NO AND DATE
A	RELEASED		(230050) 11/13/01
MDN			
B1	25.00 WAS 23.25		230050
B2	0.50 WAS 2.25		
B3	ADDED (40.50) DIMENSION		02/11/02
MDN			
C	REMOVED TAPPED HOLE		230050 2/27/02
CDB			
D	ADDED 4X Ø 0.813 THRU		(230050) 07/09/02
MDN			



8
3

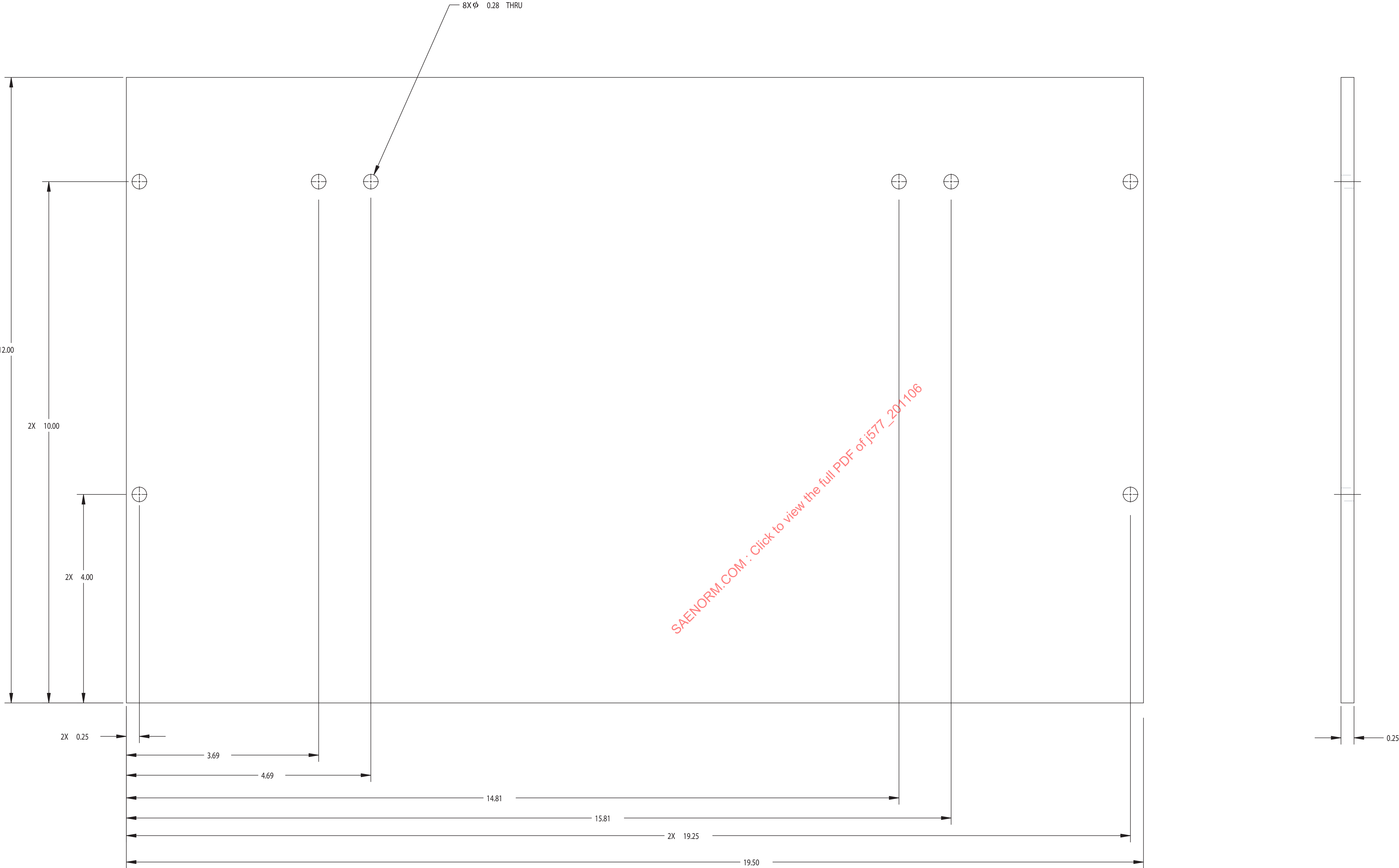
MOUNTING PLATE SUB-ASSEMBLY
(1) REQ'D ~ WELDMENT ~ STRESS RELIEVE



REV	DESCRIPTION	ENG APP'L	ECN/ECO NO AND DATE
A	RELEASED		(230050) 1/1/13/01
B	MOVED TAPPED HOLE		230050 2/27/02
C1	ADDED C BORE		(230050)
C2	4X WAS 8X		
C3	MODIFIED TAP HOLE		07/09/02
D1	Ø 0.375-16 UNC WAS Ø 0.40		
D2	39.38 WAS 39.50		
D3	(2X 33.88) WAS (2X 34.00)		
D4	ADDED DIMENSIONS		01-10-07
RF			

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GCC DENOTES GROTE CONTROL CHARACTERISTIC			
DR. BY:		M. NOE	SCALE: 1/4
DATE:		06-Nov-01	UNITS: IN
MATERIAL NO.		N/A	DO NOT SCALE DRAWING
CHECKED BY:			
MAT'L DESCRIPTION N/A			
TITLE MOUNTING BASE, J577 VIB. MACHINE			
Grote GROTE INDUSTRIES, LLC. MADISON, INDIANA U.S.A.			
SIZE	PART/DWG NO.	REV.	SHT #
D	230050-06	D	1 of 1
SYSTEM/REV. Pro/E WF2.0		3D DATA: no	

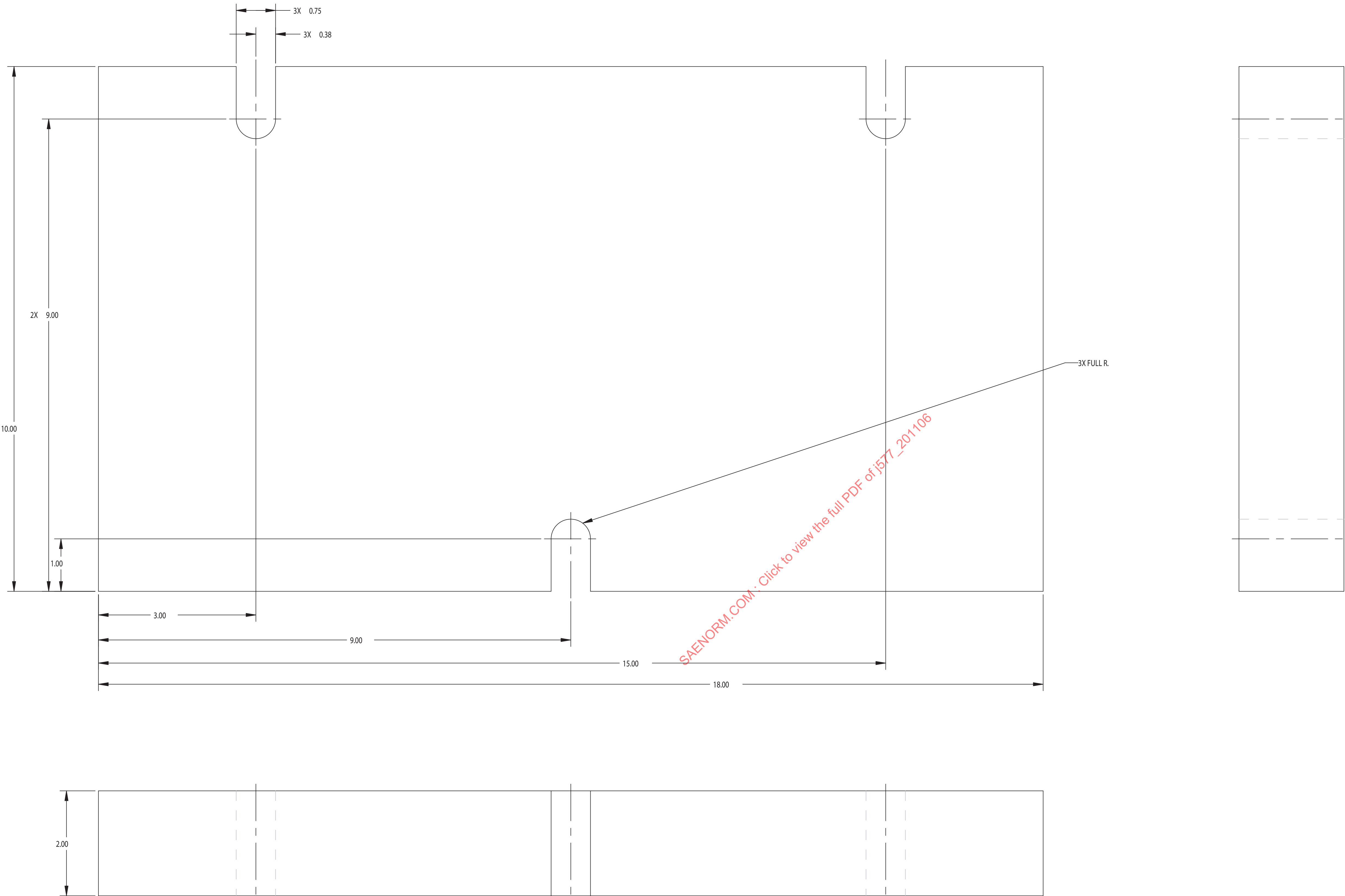
FIGURE 10—MOUNTING PLATE ASSEMBLY



WEIGHT RACK COVER
(1) REQ'D ~ 1018

REV		DESCRIPTION	ENG APPL	ECN/ECNO AND DATE
A	MDN	RELEASED		(230050) 11/13/01
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GCC DENOTES GROTE CONTROL CHARACTERISTIC			THIRD ANGLE PROJECTION	
DR. BY:		M. NOE	SCALE:	FULL UNITS: IN
DATE:		07-Nov-01	DO NOT SCALE DRAWING	
MATERIAL NO.		N/A	CHECKED BY:	
MAT'L DESCRIPTION		N/A		
TITLE				
MOUNTING BASE, J577 VIB. MACHINE				
		GROTE INDUSTRIES, LLC. MADISON, INDIANA U.S.A.		
SIZE	PART/DWG NO.		REV.	SHT #
D	230050-08		A	1 of 1
SYSTEM REV. Proj'E 2008			3D DATA: no	

FIGURE 12—WEIGHT RACK COVER



WEIGHT
(4) REQ'D ~ 1018

11
3

FIGURE 13—WEIGHT

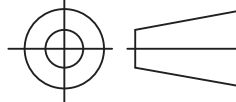
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GCC DENOTES GROTE CONTROL CHARACTERISTIC			THIRD ANGLE PROJECTION	
DR. BY:		M. NOE	SCALE:	FULL UNITS: IN
DATE:		08-Nov-01	DO NOT SCALE DRAWING	
MATERIAL NO.		N/A	CHECKED BY:	
MAT'L DESCRIPTION		N/A		
TITLE				
MOUNTING BASE, J577 VIB. MACHINE				
Grote GROTE INDUSTRIES, LLC. MADISON, INDIANA U.S.A.				
SIZE	PART/DWG NO.		REV.	SHT #
D	230050-09		A	1 of 1
SYSTEM REV. Prio/E 2000i			3D DATA: NO	

TABLE 2—J577 MACHINE BILL OF MATERIAL

BILL OF MATERIALS		
QTY	Part No.	Description
1	251942-01	Main Assembly
1	251942-02	Weldment Detail #2
1	251942-03	Weldment Detail #3
1	251942-04	Weldment Detail # 4
1	251942-05	Weldment Detail #5
4	251924-06	Weldment Detail #6
2	251942-07	Weldment Detail #8
1	251942-08	1.000 X 15.000 X 45.000 CRS
2	251942-09	1.670 DIA X 10.250 LG CRS
1	251942-12	1.250 SQ X 6.000 LG. # 4140 STL.
1	251942-13	1.250 X 1.500 X 6.000 LG. CRS
1	251942-14	0.750 X 1.000 X 4.125 LG. CRS
2	251942-15	FAFNIR PILLOW BLOCK #G1012KRRB, RAK 3/4
1	251942-16	0.500 X 6.000 X 26.625 LG. CRS
1	251942-17	0.750 X 2.000 X 11.000 CRS
1	251942-18	1.250 DIA X 13.375 LG. D2 58/62Rc STL.
1	251942-21	1.250 SQ. X 2.500 LG. #4140 STL.
1	251942-22	1.250 SQ. X 4.500 LG. CRS
2	251942-23	1.625 X 1.750 X 6.500 LG. CRS
1	251942-24	1.250 X 2.750 X 6.000 LG. D2 STL.
1	251942-25	1.000 X 2.875 X 11.875 LG. CRS
4	251942-26	Century Spring #11996
1	251942-27	Electric Motor, Baldor # CDP3320
1	251942-28	Bushed Gearbelt Pulley, Browning # 18LG075
1	251942-29	Bushed Gearbelt Pulley, Browning # 40LH075
1	251942-30	Timing Belt, Gates # 600L075
2	251942-31	Cam Follower, Roller Bearing Co. of America # S40L
2	251942-32	Cam follower # S32LW & Lube Fitting #36235 Roller Bearing Co. of America
4	251942-33	1.810 DIA X 0.344 LG. Tool STL
4	251942-34	1.810 DIA X 0.564 LG. Tool STL
1	251942-35	0.500 DIA X 2.250 X 4.000 LG CRS
2	251942-37	0.250 SQ. X 1.360 LG. Key
2	251942-38	E-Ring, McMaster Carr #98407A156
2	251942-40	1/8" Grease Zerk, McMaster Carr # 1095K11
2	251942-41	2.000 DIA X 1.500 LG Hardened D2 STL
1	251942-42	0.500 X 6.000 X12.000 LG. CRS
2	251942-43	2.000 SQ. X 14 GA. Tubing X 3.000 LG
2	251942-44	1.500 SQ X 0.125 Wall Tubing X 18.000 LG.
1	251942-45	1.500 SQ X 0.125 Wall Tubing X 11.250 LG.
1	251942-46	12GA. X 17.605 X 40.908 LG. CRS

TABLE 2—J577 MACHINE BILL OF MATERIAL (CONTINUED)

BILL OF MATERIALS		
QTY	Part No.	Description
1	251942-47	Inline Force/Torque Indicator Mark -10, Model BGI, Series SSM100
2	251942-49	0.125 SQ. X 2.000 LG. Key
1	251942-50	Red Oak Quarter Sawn 1.625 X 15.000 X 45.000 LG.
3	251942-52	Hook, Purchased W/ P/N 251942-47
2	251942-53	0.125 X 1.000 X 1.000 Angle X 1.250 LG.
1	251942-54	2.250 X 2.188 X 7.500 LG. CRS
1	251942-56	1.250 X 4.500 X 6.000 LG. CRS
2	251942-61	1.250 SQ. X 8.000 LG. CRS
1	251942-62	Sub-Assembly
1	251942-63	1.000 X 2.000 X 3.000 LG. CRS
1	251942-65	Sub-Assembly
1	251942-66	Hinge, McMaster Carr # 16175A15
1	251942-67	0.750 X 1.000 X 4.125 LG. CRS
4	251942-68	0.125 X 1.000 X 1.000 Angle X 1.000 LG.
2	251942-69	1.250 DIA X 0.437 LG. Hardened Tool STL
1	251942-70	Sub-Assembly
1	251942-71	0.250 X 1.750 X 2.125 LG. CRS
1	251942-72	Honda ATV Valve Spring #14751-KCY-670
1	251942-73	Bushing, Browning # H 3/4
1	251942-74	Bushing, Browning # G 5/8
1	251942-75	Dart Tachometer #MDIOP
1	251942-76	Dart Pulse Generator # PU2E
2	251942-77	0.125 X 1.000 X 1.500 Angle X 1.000 LG.
2	251942-78	0.250 X 1.380 X 3.000 LG. CRS
1	251942-79	0.500 X 2.375 X 2.000 Angle X 1.500 LG.
1	251942-80	1.000 DIA X 1.500 LG. ROD
1	251942-81	0.250 DIA X 4.000 LG. ROD
1	251942-82	1/4-20UNC SHCS X 1.250 LG
1	251942-83	0.093 DIA X 1.250 LG. ROD

PREPARED BY THE SAE HEAVY DUTY LIGHTING STANDARDS COMMITTEE

REAFFIRMED BY THE SAE TEST METHODS AND EQUIPMENT COMMITTEE

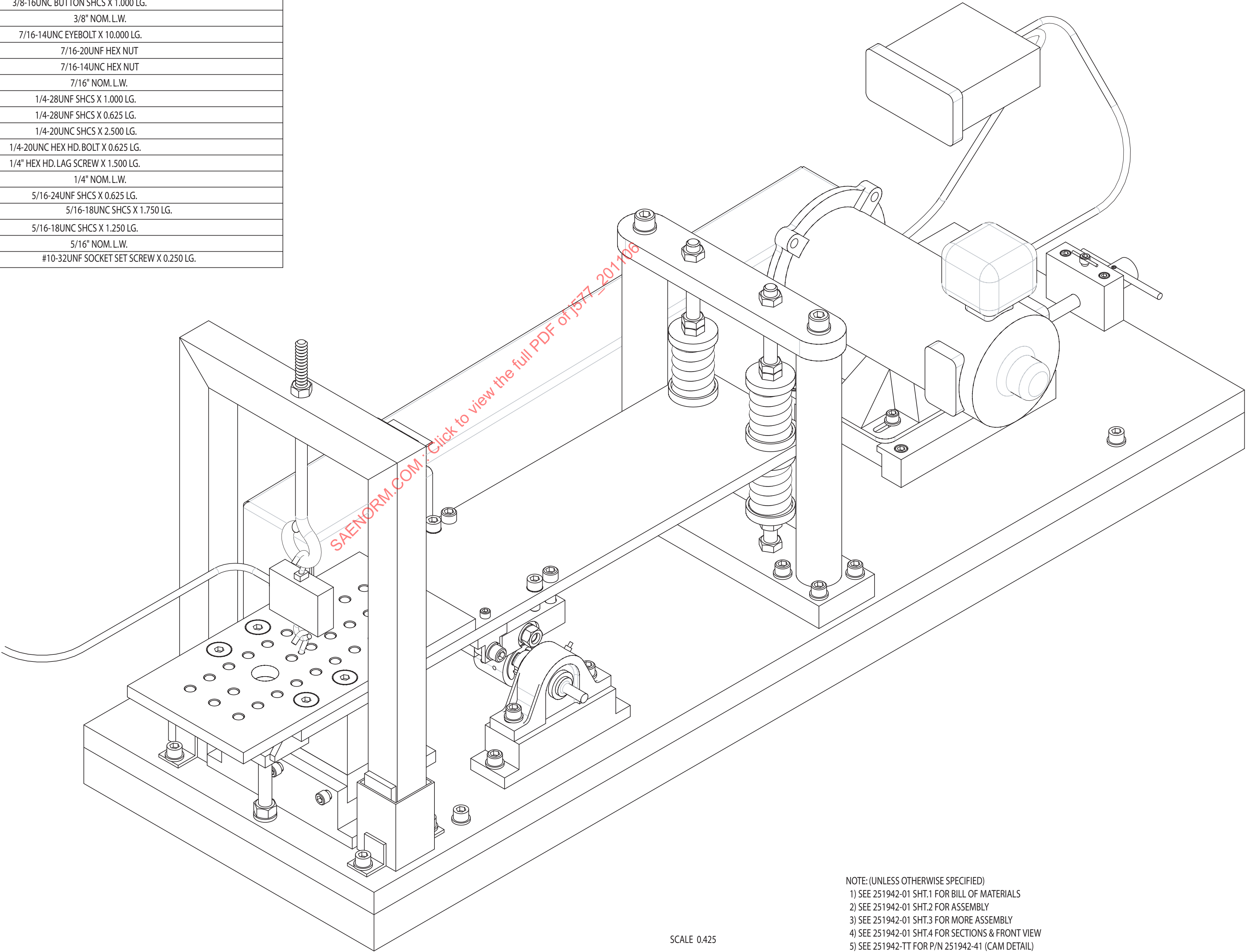
BILL OF MATERIAL			FASTENERS		
QTY.	PART NO.	DESCRIPTION	QTY.	PART NO.	DESCRIPTION
1	251942-01	MAIN ASSEMBLY	2		1/2-13UNC SHCS X 2.000 LG.
1	251942-02	WELDMENT DETAIL #2	1		1/2-13UNC SHCS X 5.500 LG.
1	251942-03	WELDMENT DETAIL #3	2		1/2-13UNC FLAT HD. SHCS X 1.250 LG.
1	251942-04	WELDMENT DETAIL #4	6		1/2-13UNC FLAT HD. SHCS X 1.000 LG.
1	251942-05	WELDMENT DETAIL #5	2		1/2-13UNC ALL-THD. X 12.500 LG.
4	251942-06	WELDMENT DETAIL #6	1		1/2-13UNC ALL-THD. X 9.250 LG.
2	251942-07	WELDMENT DETAIL #8	2		1/2-20UNF HEX NUT
1	251942-08	1.000 X 15.000 X 45.000 CRS	1		1/2-13UNC HEX NUT
2	251942-09	ϕ 1.670 X 10.250 LG. CRS	12		1/2-13UNC HEX JAM NUT
1	251942-12	1.250 SQ. X 6.000 LG. #4140 STL.	5		1/2" NOM. L.W.
1	251942-13	1.250 X 1.500 X 6.000 LG. CRS	8		3/8-16UNC SHCS X 2.000 LG.
1	251942-14	0.750 X 1.000 X 4.125 LG. CRS	12		3/8-16UNC SHCS X 1.500 LG.
2	251942-15	FAFNIR PILLOW BLOCK #G1012KRRB, RAK 3/4	2		3/8-16UNC SHCS X 1.250 LG.
1	251942-16	0.500 X 6.000 X 26.625 LG. CRS	2		3/8-16UNC SHCS X 1.875 LG.
1	251942-17	0.750 X 2.000 X 11.000 CRS	6		3/8-16UNC SHCS X 1.000 LG.
1	251942-18	ϕ 1.250 X 13.375 LG. D2 58/62Rc STL.	4		3/8-16UNC SHCS X "A" LG.
1	251942-21	1.250 SQ. X 2.500 LG. #4140 STL.	2		3/8-16UNC BUTTON SHCS X 1.000 LG.
1	251942-22	1.250 SQ. X 4.500 LG. CRS	30		3/8" NOM. L.W.
2	251942-23	1.625 X 1.750 X 6.500 LG. CRS	1		7/16-14UNC EYEBOLT X 10.000 LG.
1	251942-24	1.250 X 2.750 X 6.000 LG. D2 STL.	2		7/16-20UNF HEX NUT
1	251942-25	1.000 X 2.875 X 11.875 LG. CRS	1		7/16-14UNC HEX NUT
4	251942-26	CENTURY SPRING #11996	2		7/16" NOM. L.W.
1	251942-27	ELECTRIC MOTOR, BALDOR #CDP3320	2		1/4-28UNF SHCS X 1.000 LG.
1	251942-28	BUSHED GEARBELT PULLEY, BROWNING #18LG075	4		1/4-28UNF SHCS X 0.625 LG.
1	2519472-29	BUSHED GEARBELT PULLEY, BROWNING #40LH075	2		1/4-20UNC SHCS X 2.500 LG.
1	251942-30	TIMING BELT, GATES #600L075	4		1/4-20UNC HEX HD. BOLT X 0.625 LG.
2	251942-31	CAM FOLLOWER, ROLLER BEARING CO. OF AMERICA #540L	4		1/4" HEX HD. LAG SCREW X 1.500 LG.
2	251942-32	CAM FOLLOWER #532LW & LUB FITTING #36235 ROLLER BEARING CO. OF AMERICA	8		1/4" NOM. L.W.
4	251942-33	ϕ 1.810 X 0.344 LG. TOOL STL.	3		5/16-24UNF SHCS X 0.625 LG.
4	251942-34	ϕ 1.810 X 0.564 LG. TOOL STL.	4		5/16-18UNC SHCS X 1.750 LG.
1	251942-35	0.500 X 2.250 X 4.000 LG. CRS	4		5/16-18UNC SHCS X 1.250 LG.
2	251942-37	0.250 SQ. X 1.360 LG. KEY	9		5/16" NOM. L.W.
2	251942-38	E-RING, MCMASTER CARR #98407A156	4		#10-32UNF SOCKET SET SCREW X 0.250 LG.
2	251942-40	1/8" GREASE ZERK, MCMASTER CARR #1095K11			
2	251942-41	ϕ 2.000 X 1.500 LG. HARDENED D2 STL.			
1	251942-42	0.500 X 6.000 X 12.000 LG. CRS			
2	251942-43	2.000 SQ. X 14GA. TUBING X 3.000 LG.			
2	251942-44	1.500 SQ. X 0.125 WALL TUBING X 18.000 LG.			
1	251942-45	1.500 SQ. X 0.125 WALL TUBING X 11.250 LG.			
1	251942-46	12GA. X 17.605 X 40.908 LG. CRS			
1	251942-47	INLINE FORCE/TORQUE INDICATOR MARK-10, MODEL BGI, SERIES SSM100			
2	251942-49	0.125 SQ. X 2.000 LG. KEY			
1	251942-50	RED OAK QUARTER SAWN 1.625 X 15.000 X 45.000 LG.			
3	251942-52	HOOK, PURCHASED W/ P/N 251942-47			
2	251942-53	0.125 X 1.000 X 1.000 ANGLE X 1.250 LG.			
1	251942-54	2.250 X 2.188 X 7.500 LG. CRS			
1	251942-56	1.250 X 4.500 X 6.000 LG. CRS			
2	251942-61	1.250 SQ. X 8.000 LG. CRS			
1	251942-62	SUB-ASSEMBLY			
1	251942-63	1.000 X 2.000 X 3.000 LG. CRS			
1	251942-65	SUB-ASSEMBLY			
1	251942-66	HINGE, MCMASTER CARR #16175A15			
1	251942-67	0.750 X 1.000 X 4.125 LG. CRS			
4	251942-68	0.125 X 1.000 X 1.000 ANGLE X 1.000 LG.			
2	251942-69	ϕ 1.250 X 0.437 LG. HARDENED TOOL STL.			
1	251942-70	SUB-ASSEMBLY			
1	251942-71	0.250 X 1.750 X 2.125 LG. CRS			
1	251942-72	HONDA ATV VALVE SPRING #14751-KCY-670			
1	251942-73	BUSHING, BROWNING #H 3/4			
1	251942-74	BUSHING, BROWNING #G 5/8			
1	251942-75	DART TACHOMETER #MD10P			
1	251942-76	DART PULSE GENERATOR #PU2E			
2	251942-77	0.1250 X 1.000 X 1.500 ANGLE X 1.000 LG.			
2	251942-78	0.250 X 1.380 X 3.000 LG. CRS			
1	251942-79	0.500 X 2.375 X 2.000 ANGLE X 1.500 LG.			
1	251942-80	ϕ 1.000 X 1.500 LG. ROD			
1	251942-81	ϕ 0.250 X 4.000 LG. ROD			
1	251942-82	1/4-20UNC SHCS X 1.250 LG.			
1	251942-83	ϕ 0.093 X 1.250 LG. ROD			

F1

E1

E2

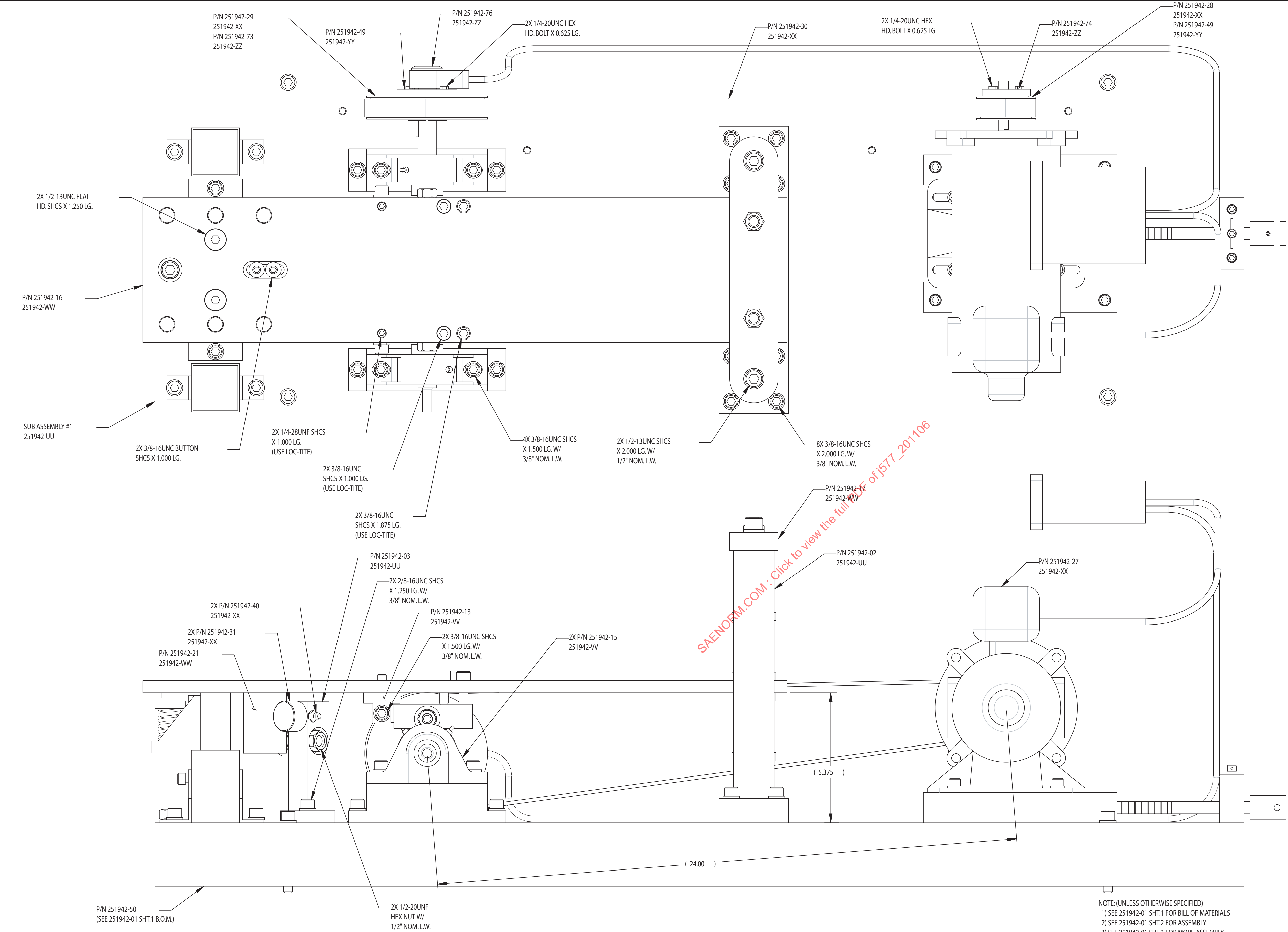
F2



- NOTE: (UNLESS OTHERWISE SPECIFIED)
- 1) SEE 251942-01 SHT.1 FOR BILL OF MATERIALS
 - 2) SEE 251942-01 SHT.2 FOR ASSEMBLY
 - 3) SEE 251942-01 SHT.3 FOR MORE ASSEMBLY
 - 4) SEE 251942-01 SHT.4 FOR SECTIONS & FRONT VIEW
 - 5) SEE 251942-TT FOR P/N 251942-41 (CAM DETAIL)
 - 6) SEE 251942-UU FOR WELDMENTS & SUB-ASSEMBLY'S
 - 7) SEE 251942-VV FOR WELDMENTS, SUB-ASSEMBLY'S, & PARTS
 - 8) SEE 251942-WW FOR PARTS
 - 9) SEE 251942-XX FOR PARTS
 - 10) SEE 251942-YY FOR PARTS
 - 11) SEE 251942-ZZ FOR PARTS

REV	DESCRIPTION	ENG APPL	ECN/ECO NO AND DATE	
B GDS	REDRAWN & UPDATED ON PRO/E		251942 07/10/03	
C GDS	P/N 251942-18 - 58/62Rc STL WAS 62/94Rc STL		251942 11/14/03	
D CDB	P/N 251942-37- 0.250 x 0.360 WAS 0.190 x 0.380		251942 12/11/03	
E1 E2 CDB	DELETED P/N 251942-48 P/N 251942-49 QTY 2 WAS 1		251942 12/22/03	
F1 F2 GDS	P/N 251942-32- ADDED LUB FITTING P/N 251942-71- 1.750 X 2.125 WAS 2.000 X 2.375		251942 05/27/04	
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GCC DENOTES GROTE CONTROL CHARACTERISTIC  THIRD ANGLE PROJECTION				
DR. BY: G.SMITH		SCALE: 1/2	UNITS: IN	
DATE: 10-July-03		DO NOT SCALE DRAWING		
MATERIAL NO. N/A		CHECKED BY:		
MAT'L DESCRIPTION N/A				
TITLE VIBRATION TEST STAND PER SAE J577 (BILL OF MATERIALS)				
 GROTE INDUSTRIES, LLC. MADISON, INDIANA U.S.A.				
SIZE D	PART/DWG NO. 251942-01		REV. F	SHT # 1 of 4
SYSTEM/REV. Proj'E 2001			3D DATA: YES	

FIGURE 14—VIBRATION TEST MACHINE ASSEMBLY



P/N 251942-50
(SEE 251942-01 SHT.1 B.O.M.)

2X 1/2-20UNF
HEX NUT W/
1/2" NOM.L.W.

NOTE:(UNLESS OTHERWISE SPECIFIED)
1) SEE 251942-01 SHT.1 FOR BILL OF MATERIALS
2) SEE 251942-01 SHT.2 FOR ASSEMBLY
3) SEE 251942-01 SHT.3 FOR MORE ASSEMBLY
4) SEE 251942-01 SHT.4 FOR SECTIONS & FRONT VIEW
5) SEE 251942-TT FOR P/N 251942-41 (CAM DETAIL)
6) SEE 251942-UU FOR WELDMENTS & SUB-ASSEMBLY'S
7) SEE 251942-VV FOR WELDMENTS, SUB-ASSEMBLY'S, & PARTS
8) SEE 251942-WW FOR PARTS
9) SEE 251942-XX FOR PARTS
10) SEE 251942-YY FOR PARTS
11) SEE 251942-ZZ FOR PARTS

REV	DESCRIPTION	ENG APPL	ECN/ECONO AND DATE
B	REDRAWN & UPDATED ON PROJ.E		251942 07/10/03
C	P/N 251942-18 - 58/62Rc STL.WAS 62/94Rc STL.		251942 11/14/03
D	P/N 251942-37 -0.250 x 0.360 WAS 0.190 x 0.360		251942 12/11/03
E	SEE SHEET 1		251942 12/22/03
F	SEE SHEET 1		251942 05/27/04

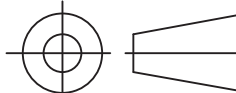
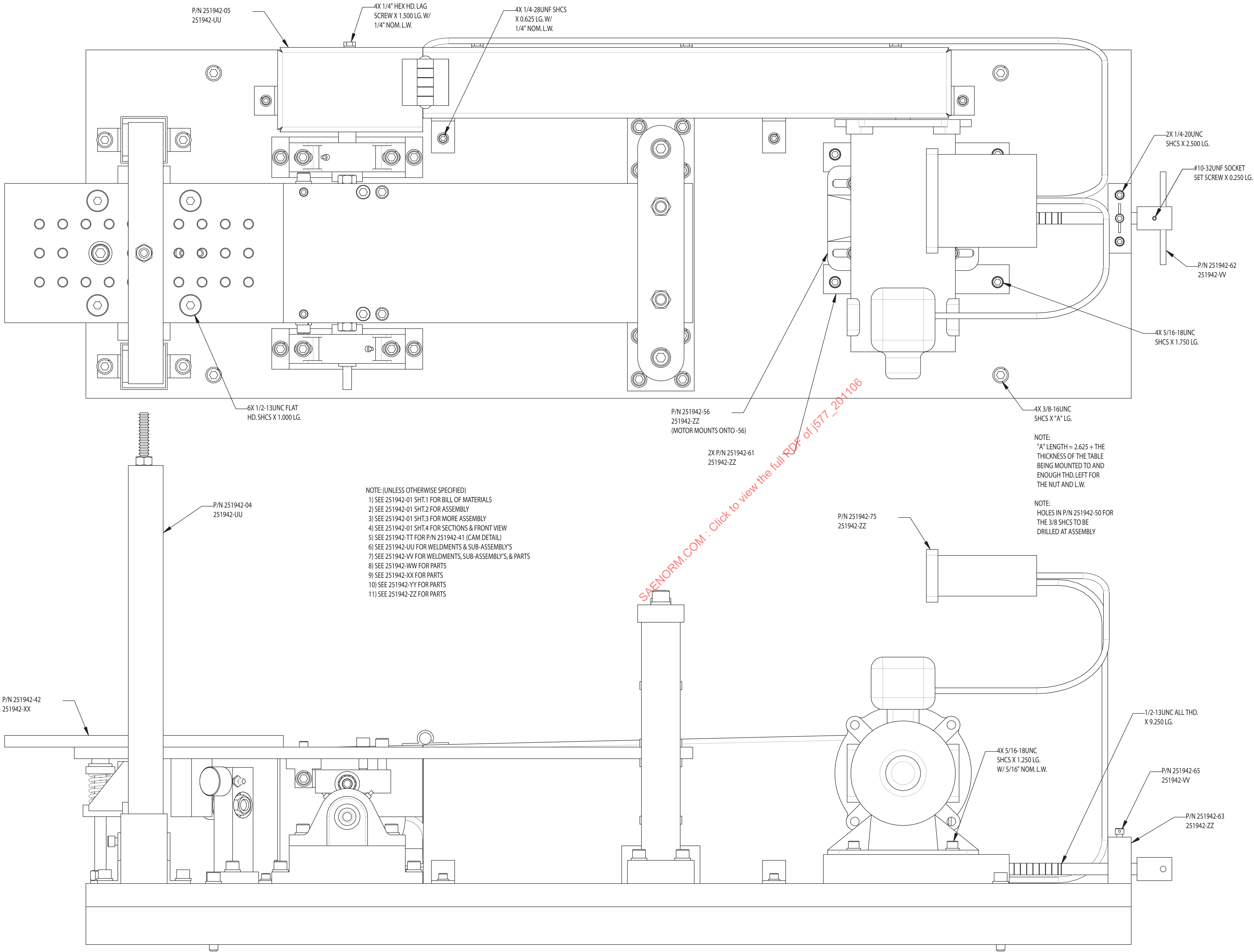
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GCC DENOTES GROTE CONTROL CHARACTERISTIC		 THIRD ANGLE PROJECTION	
DR. BY:	G.SMITH	SCALE:	1/2 UNITS: IN
DATE:	11-July-03	DO NOT SCALE DRAWING	
MATERIAL NO.	N/A	CHECKED BY:	
MATERIAL DESCRIPTION			
N/A			
TITLE			
VIBRATION TEST STAND PER SAE J577 (ASSEMBLY)			
Grote GROTE INDUSTRIES, LLC. MADISON, INDIANA U.S.A.			
SIZE	PART/DWG NO.	REV.	SHT #
D	251942-01	F	2 of 4
SYSTEM REV. Proj'E 2001		3D DATA: YES	

FIGURE 15—VIBRATION MACHINE TOP AND SIDE VIEWS



REV	DESCRIPTION	ENG APPL	ECN/ECO NO AND DATE
B	REDRAWN & UPDATED ON PROE		251942 07/10/03
C	P/N 251942-18 - 58/62Rc STL WAS		251942 11/14/03
D	P/N 251942-37 - 0.250 x 0.360 WAS		251942 12/11/03
E	SEE SHEET 1		251943 12/22/03
F	SEE SHEET 1		251942 05/27/04

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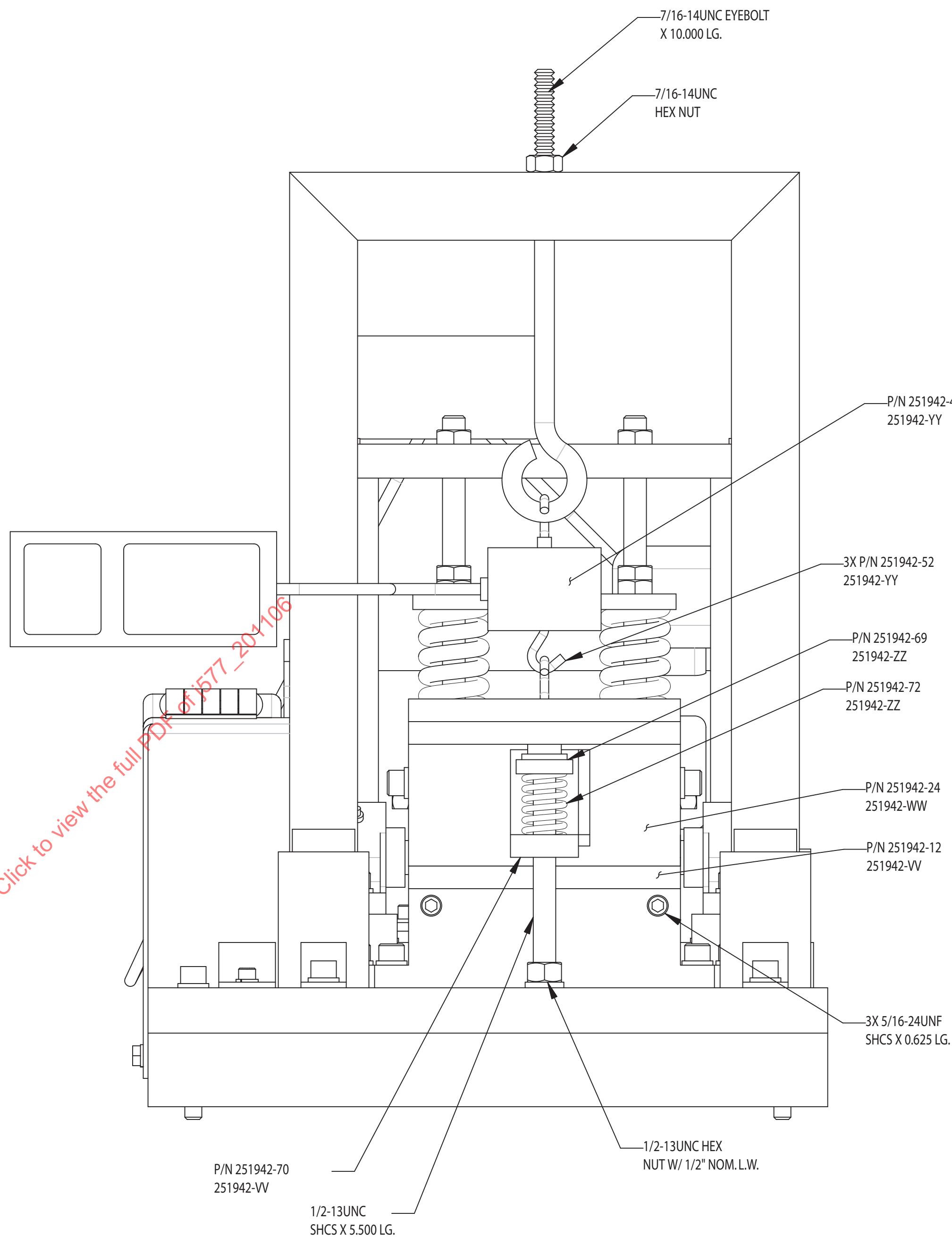
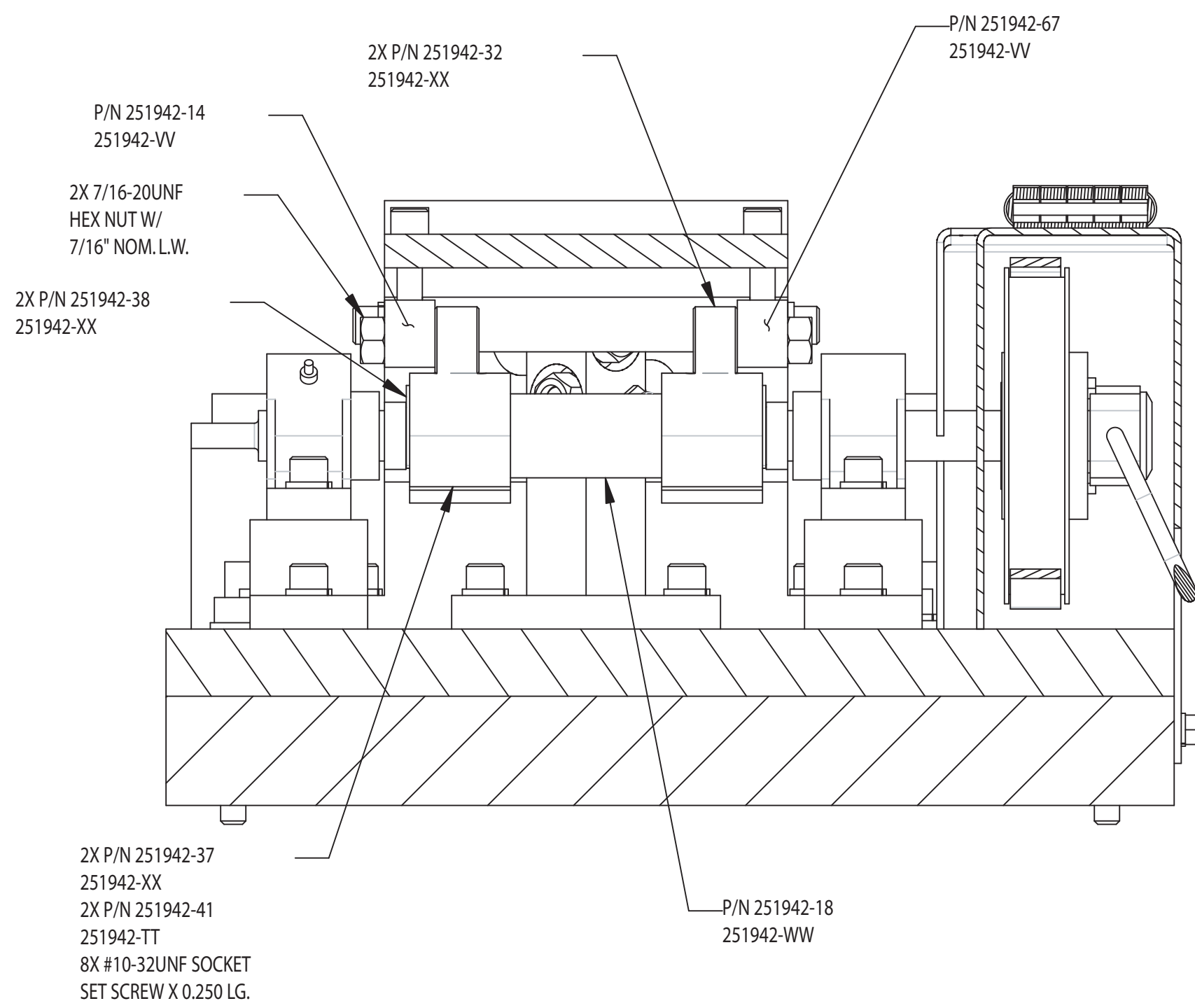
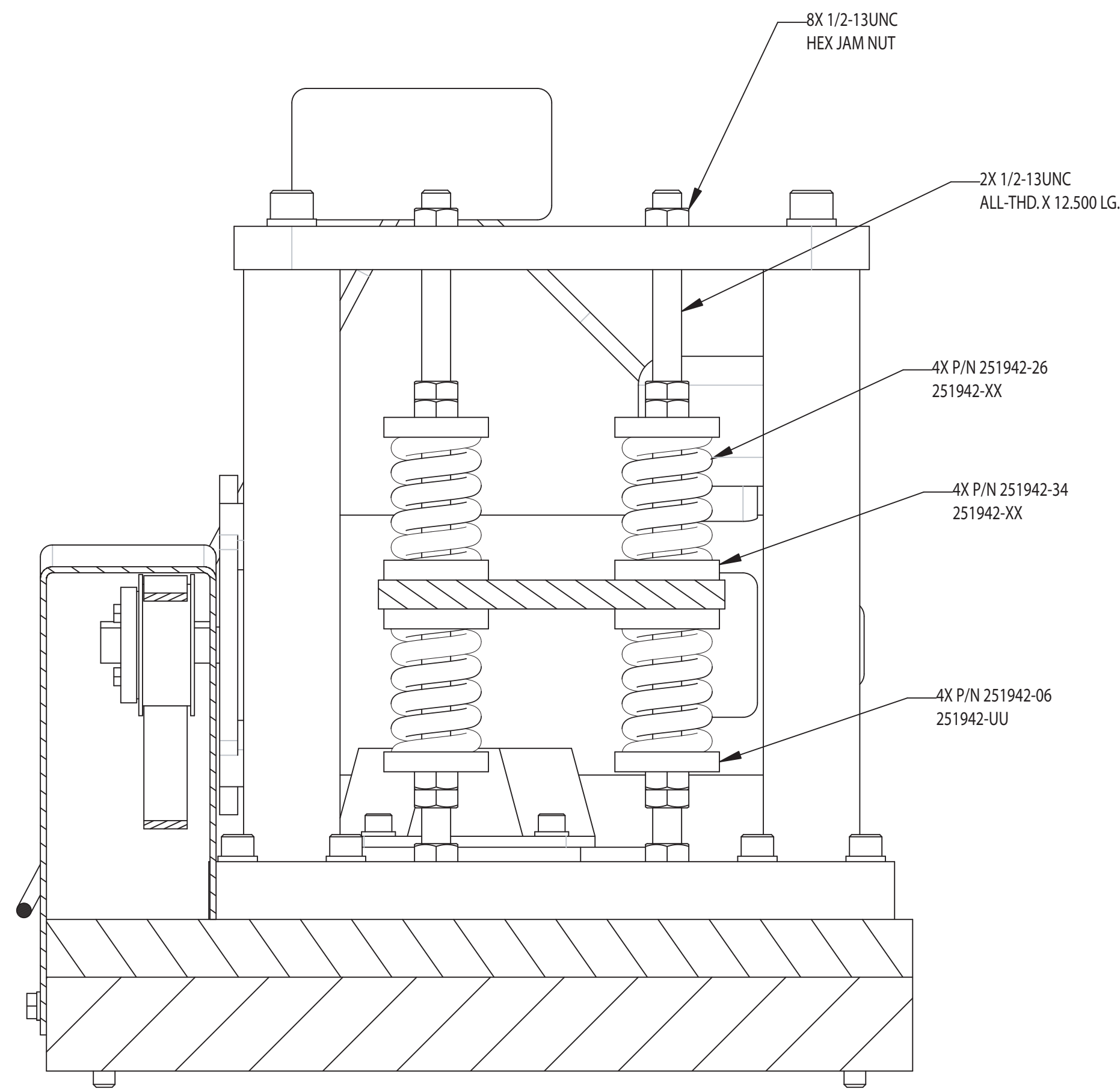
GCC
DENOTES GROTE CONTROL CHARACTERISTIC

THIRD ANGLE PROJECTION

DR. BY:	G.SMITH	SCALE:	1/2	UNITS:	IN
DATE:	11-July-03	DO NOT SCALE DRAWING			
MATERIAL NO.	N/A	CHECKED BY:			
MATL DESCRIPTION N/A					
TITLE VIBRATION TEST STAND PER SAE J577 (MORE ASSEMBLY)					
Grote GROTE INDUSTRIES, LLC MADISON, INDIANA U.S.A.					
SIZE	PART/DWG NO.	REV:	SHT #		
D	251942-01	F	3 of 4		

SYSTEM REV:	3D DATA:	YES
Proj/E 2001		

FIGURE 16—VIBRATION MACHINE WITH CALIBRATION FRAME



- NOTE: (UNLESS OTHERWISE SPECIFIED)
- 1) SEE 251942-01 SHT.1 FOR BILL OF MATERIALS
 - 2) SEE 251942-01 SHT.2 FOR ASSEMBLY
 - 3) SEE 251942-01 SHT.3 FOR MORE ASSEMBLY
 - 4) SEE 251942-01 SHT.4 FOR SECTIONS & FRONT VIEW
 - 5) SEE 251942-TT FOR P/N 251942-41 (CAM DETAIL)
 - 6) SEE 251942-UU FOR WELDMENTS & SUB-ASSEMBLY'S
 - 7) SEE 251942-VV FOR WELDMENTS, SUB-ASSEMBLY'S, & PARTS
 - 8) SEE 251942-WW FOR PARTS
 - 9) SEE 251942-XX FOR PARTS
 - 10) SEE 251942-YY FOR PARTS
 - 11) SEE 251942-ZZ FOR PARTS

REV	DESCRIPTION	ENG APPL	ECN/ECO NO AND DATE
B	REDRAWN & UPDATED ON PROJE		251942 07/10/03
C	P/N 251942-18 - 58/62Rc STL WAS		251942 11/14/03
D	P/N 251942-37 - 0.250 x 0.360 WAS		251942 12/11/03
E	SEE SHEET 1		251943 12/22/03
F	SEE SHEET 1		251942 05/27/04

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GCC

DENOTES GROTE CONTROL CHARACTERISTIC

THIRD ANGLE PROJECTION

DR. BY:	G.SMITH	SCALE:	0.500	UNITS:	IN
DATE:	11-July-03	DO NOT SCALE DRAWING			
MATERIAL NO.	CHECKED BY:				
MATL DESCRIPTION					
TITLE					
VIBRATION TEST STAND PER SAE J577 (SECTIONS & FRONT VIEW)					
Grote GROTE INDUSTRIES, LLC. MADISON, INDIANA U.S.A.					
SIZE	PART/OWG NO.	REV	SHT #		
D	251942-01	F	4 of 4		

SYSTEM REV:	3D DATA:	YES
Proj/E 2001		

FIGURE 17—VIBRATION MACHINE CROSS SECTIONS