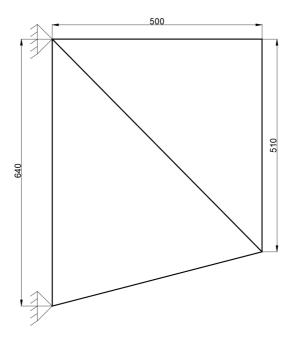
Bancada de motor - 1

El siguiente problema representa la bancada de motor de una aeronave bimotor turbohélice. La misma se encuentra equipada con motores Pratt & Whitney PW118 y una hélice Hamilton Sundstrand 14RF-9.



El equipo de diseño le entrega los siguientes datos calculados de acuerdo a lo especificado por la norma *FAR 25 - Subpart C: Structure*, para la condición de despegue:

Cargas verticales: 9096 N

- Tracción: 31543 N

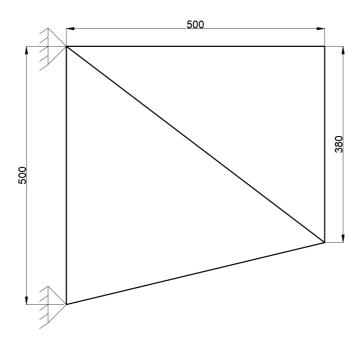
Con los datos de la estructura y de cargas, calcule los desplazamientos de todos los nodos de la bancada para la condición propuesta. El material a utilizar es caño de 2" y 0.095" de espesor, SAE4130. (Ver tabla adjunta)

Nota: Considerar que las cargas se reparten de forma equivalente en los 2 nodos de la derecha. Expresar los resultados en el SI.

tht Ins. Dural	2.80	4.73	3,04 4,00 5,06	64.4.4.4.4.4.4.4.4.4.4.4.4.4.4.4.4.4.4.	4.82 0.03 8.83 8.80 8.80			8.78 11.00	6.58 8.35 9.52 11.95	7.09 9.01 10.25	7.60 9.67 11.04	8.12 10.32 11.78 14.80	21.55	
Weight Lb/100 ins. Steel Dura	7.95	13,25	.50 10.03* 11.19 14.16	9.59 11.30 12.64 16.01	10.68 12.60 14.09*	20.34 11.78 13.90 15.50*	22.48 16.18 16.95	24.56 30.76	18.40 23.38 26.66 33.43	19.85 25.20 28.70	21.30 27.06 30.84	22.75 28.95 32.95 41.40*	60,40*	
D/t	38.25	28.80	40,80 34,45 30,75 24,10	45.90 38.80 34.60	\$1.00 43.10 38.45	26.30 47.40 42.30	51.70 46.20	31.58 31.58 25.00	39.15 34.20 27.10	53.80 42.20 36.85 29.15	57.60 45.20 39.50 31.25	61.50 42.20 42.10 33.33	28.80	
1/7	12500	20050	14299 16696 18514 2301	. 1824 . 2369 . 2953	2655	.4158 .2759 .3233 .3596	. 5084 . 3868 . 4305	.7518	. 5077 . 6376 . 7217 . 8906	.5914 .7435 .8422 1.0411	.6814 .8576 .9722 1,2035	.9799 .9799 1.1114 1.3776	2,2347	
ı	.08565	15156	.14299 .16696 .18514 .2300	. 2052 2401 2665 3322	.2834 .3318 .3688 .4607	. 5197 . 3793 . 4446 . 4944	. 6991 . 6457	. 9156 1,1276	.8251 1.0361 1.1727 1.4472	1,0349 1,3012 1,4739 1,8220	1.2777 1.6080 1.8228 2.2565	1.5557 1.9597 2.2228 2.7552 3.6732	5.0282	TUBING
م	.6458	6404	.6869 .6845 .8783	7753	. 8667 . 8635 . 8613 . 8550	. 9551 . 0521 . 9496	. 9393 1.0403 1.0380	1,0276	1,1263 1,1201 1,1160	1,2085 1,2043 1,1958		1,3852 1,3852 1,3810 1,3725 1,4557	1.5369	9
٧	2023	.4673	.3951 .3951 .4999	3388	. 3773 . 4450 . 4972 . 6302	.4158 .4905 .5483		.8670 1,0857 5816	.6504 .8258 .9416	.7014 .8910 1.0162	. 7525 . 9562 1. 0908 1. 3685	.8035 1.0214 1.1655 1.4627 1.7327	2,1289	×
Gage	0.035	.083	058 058 065 083	.058 .065 .083	0.058	. 049 . 058 . 065	.095 .095 .065	120	.083 .095 .120	.065 .083 .095		.065 .083 .120	.156	
Dia.	1 7/8		01	2 1/4	2 1/2	2 3/4	n	3 1/4		3 1/2	3 3/4	4 1,	4 1/2	
tht Jins. Dural	. 20	.38	.52	. 54 . 90 1. 05		.76 .94* 1.29 1.51 1.68	1.07* 1.48 1.74 1.93	1.21	1.35* 1.87* 2.20	2.43	1.63 2.26 2.66	3.74 2.89 3.23	4.06 1.91 2.65	3.12
Weight Lb/100 ins Steel Dura	3.5	1.06	1.17	1.49 1.84 2.51 2.93	3.57	2.62 3.60 4.22 4.66	3.01* 4.15 4.86 5.41	3.40* 4.68* 5.51	3,78* 6,13* 6,86	4.17 5.78 6.80 7.58	4.56 6.32 7.45 8.30		11.40 5.32 7.42*	8.73 9.75 12.32
D/t	8.33	13.39	17.85 14.28 10.20	22.30 17.85 12.77 10.79	21.42 15.30 12.94 11.53	31.23 25.00 17.85 15.10	28.56 20.40 17.25 15.38	32.10 22.95 19.40	35.70 25.50 21.55	39.25 28.05 23.70	42.80 30.60 25.85 23.05	18.08 46.40 33.15 28.00 25.00	19.58	30.20 26.90 21.10
1/4	.000825	.002912	.004641 .005559	.007503 .009065 .011852 .013425	013429 017762 02027 02208	.015289 .018653 .02487 .02853	.02474 .03319 .03822 .04193	.03168	.03948 .05342 .06187	.04814 .06534 .07583	.05765 .07847 .09121	.06803 .09279 .10801	.07927	13977
	.000103	.000162	.001160 .001390 .001786	.002345 .002833 .003704 .004195	005036 006661 007601	.006689 .008161 .010882 .012484	.012368 .016594 .019111	.01782 .02402 .02775	.02467 .03339 .03867	.03309 .04492 .05213	.04324 .05885 .06841	.09305 .05528 .07540 .08776	.06936	11046 12230 19136
م	.0810	1231	.1672 .1649 .1576	.2090 .2090 .2044 .2016	2531 2485 2455 2433	2996 2973 2925 2896 2865	.3414 .3367 .3337	3856 3808 3780	4297 4250 4219 4196	4739 4691 4661 4638	5181 5132 5102 5079	.5018 .5622 .5575 .5544	. 6065	5962
4	.01576	.03063	.04152 .05113 .06943	.05252 .06487 .08867 .10331	.07862 .10791 .12609 .13988	.09236 .12715 .14887	.10611 .14640 .17164 .19093	.11985 .16564 .19442	13360 18488 2172	. 1473 . 2041 . 2400 . 2675	. 2234 . 2628 . 2930	. 3695 . 1748 . 2426 . 2855	.4021	.3441
Gage	.022	035	.035	0.028	035	.028 .035 .058	.035 .049 .058	035	0.035	035 049 058	035	.083 .049 .058	035	058
Dia.	1/4	3/8	1/2	8/8	,	1/8		1 1/8	1 1/4	1 3/8	1 1/2	1 5/8	1 3/4	

Bancada de motor - 2

El siguiente problema representa la bancada de motor de una aeronave bimotor turbohélice. La misma se encuentra equipada con motores Pratt & Whitney PW118 y una hélice Hamilton Sundstrand 14RF-9.



El equipo de diseño le entrega los siguientes datos calculados de acuerdo a lo especificado por la norma *FAR 25 - Subpart C: Structure,* para la condición de crucero:

Cargas verticales: 10915 N

- Tracción: 13248 N

Con los datos de la estructura y de cargas, calcule los desplazamientos de todos los nodos de la bancada para la condición propuesta. El material a utilizar es caño de 1 7/8" y 0.083" de espesor, SAE4130. (Ver tabla adjunta)

Nota: Considerar que las cargas se reparten de forma equivalente en cada nodo. Expresar los resultados en el SI.

ht ins. Dural	2.00	4.73	3.04 5.06 7.06 7.06	5.4.4.05 4.05.43	6.03 8.50 9.83 8.38	7. 24 4. 27 5. 55 4. 4. 4. 4. 4. 4. 4. 4. 4. 4. 4. 4. 4.	8,03 6,06	11.00	6.58 8.35 9.52 11.95	7.09 9.01 10.25	7.60 9.67 11.04	10.32 11.78 14.80*	27, 20
Weight Lb/100 ins. Steel Dural	7.95	13,25	.50 10.03# 11.19 14.16	9.59 11.30 * 12.64 16.01	10.68 12.60 14.09*	20.34 11.78 13.90 15.50*	16.18	24.56 30.76	18.40 23.38* 26.66	19.85 25.20 28.70*	21.30 27.06 30.84 38.70	28.95 32.95 41.40*	60.40* 76.25*
D/t	38.60		40.80 34.45 30.75 24.10	45.90 38.80 34.60	51.00 43.10 38.45	26.30 47.40 42.30	51.70	31.58	39.15 34.20 27.10	53.80 42.20 36.85 29.15	31.25	42.20 42.10 33.33	28.80
1/7	.12500	16166	.14299 .16696 .18514 .2301	. 1824 . 2134 . 2953	2257 2655 2950 3686	.4158 .2759 .3233 .3596	3868	.7518	.5077 .6376 .7217 .8906	.5914 .7435 .8422 1.0411	.6814 .8576 .9722 1.2035	.9799 1.1114 1.3776 1.7408	2,2347
п	.08565	15156	.14299 .16696 .18514 .2300	2052 2401 3322	.2834 .3318 .3688	. 5197 . 3793 . 4446 . 4944	. 5802 . 6457	.9156 1.1276	.8251 1.0361 1.1727 1.4472	1.0349 1.3012 1.4739 1.8220	1.2777 1.6080 1.8228 2.2565	1.9597 2.2228 2.7552 3.6732	5.0282 7.0213 TUBING
م	6458	6404	. 6869 . 6845 . 8783 . 6744	7753	. 8667 . 8667 . 8635 . 8550	. 9551 . 0521 . 9496	. 9393 1. 0403 1. 0380	1,0276		1.2147 1.2085 1.2043 1.1958	3031 2968 2927 2841	1.3852 1.3852 1.3725 1.4557	1.5369 1.6143 STANDARD TI
4	.2023	.4673	.3539 .3951 .4999	3388	.3773 .4450 .4972	.4158 .4905 .5483		00r u	.6504 .8258 .9416	.7014 .8910 1.0162		1.0214 1.1655 1.4627	2.1289 2.6944 * AN S
Gage	035	.083	.058 .058 .065 .083	.058 .065 .083	.049 .058 .065	.095 .058 .065			.083 .083 .120	.083 .083 .095		.134	.188
Dia.	1 7/8		cq.	2 1/4	2 1/2	2 3/4	n		7 7 7	3 1/2	3/4	4 1/4	4 3/4
ins. Jural	.20	.38	. 52*	.66* .90	. 80. 1. 09 1. 28	.94* 1.29 1.51 1.68	1.07* 1.48 1.74 1.93	1.21	1.35* 1.87* 2.20	1.49 2.43 2.70	1.63 2.26 2.66	2. 2. 2. 2. 4. 4. 4. 4. 4. 4. 4. 4. 4. 4. 4. 4. 4.	1.91 3.12 4.40
Weight Lb/100 ins. Steel Dural	. 55	1.06	1.17 1.45* 1.96		2.23 3.06 3.57 3.96	2.62 3.60 4.22 4.66	3.01 * 4.15 4.86 5.41	3.40 5.51		5.78 * 6.80	6.32* 7.45 8.30	4.95 6.87 8.09 9.05	5.32 7.42* 8.73* 9.75
D/t	11.38 8.23	13.39	17.85 14.28 10.20	22.30 17.85 12.77 10.79	25.80 21.42 15.30 12.94 11.53	31.23 25.00 17.85 15.10	28.56 20.40 17.25 15.38	32.10 22.95 19.40	35.70 25.50 21.55	39.25 28.05 23.70	42.80 30.60 25.85	46.40 33.15 28.00 25.00	
۲/۱	.000825	.002466	.005559 .005559	.007503 .009065 .011852	.011052 .013429 .017762 .02027	.015289 .018653 .02487 .02853	.02474 .03319 .03822	.04270	.03948 .05342 .06187	.04814 .06534 .07583	.05765 .07847 .09121	.06803 .09279 .10801 .11948	.07927 .10832 .12624 .13977
-	.000103	.000546	.001160 .001390 .001786	.002345 .002833 .003704 .004195	.005036 .005661 .007601	.006689 .008161 .010882 .012484	.012368 .016594 .019111	02402	.02467 .03339 .03867 .04260	.03309 .04492 .05213	.04324 .05885 .06841 .07558	.05528 .07540 .08776 .09707	06936 09478 11046 12230 19136
م	.0810	1231	.1672	.2090 .2044 .2016	.2531 .2485 .2455	2996 2973 2925 2886 2865	.3367 .3337 .3314	3856	.4297 .4250 .4219	.4691 .4661 .4638	.5132 .5132 .5102 .5079	.5575 .5544 .5520 .5459	.6065 .5986 .5962 .5962
4	.01576	.03739	.05113	.05252 .06487 .08867 .10331	.07862 .10791 .12609	.09236 .12715 .14887 .16541	.10611 .14640 .17164 .19093	11985	13360 18488 2172 2420	.1473 .2041 .2400	.2234 .2628 .2930	.1748 .2426 .2855 .3186	.1885 .2618 .3083 .3441
Gage	.022	028	. 035 . 040	.035 .049 .058	.035 .049 .058	.028 .035 .058	.035 .049 .058	0.035	0.035	049 058 065	. 049 . 058 . 065	035 058 065 083	.035 .049 .058 .065
Dia.	1/4	3/8	1/2	8/8	*	1/8		1 1/8	1 1/4	1 3/8	1 1/2	1 5/8	1 3/4