

Macalloy



TENSION STRUCTURES.

TENSION RODS | COMPRESSION STRUTS | STAINLESS CABLES
CONNECTION SOLUTIONS | SITE SERVICE



Welcome

With innovation at the heart of our company ethos, Macalloy has been developing new systems and technologies in Tensile Structures since the early 1980's.

Macalloy is a proven market leader in the design, manufacture and supply of threaded bar systems. Macalloy has experience in liaising with world renowned specifiers and contractors for the development of some truly unique and pioneering structures.

Macalloy's Tension Structures range is approved with European Technical Approval – ETA 07/0215, providing the CE certification, alongside other globally recognised certifications.





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Tension Rods

Material Properties						
Product Name	Material	Min. Yield Stress N/mm ²	Min. Breaking Stress N/mm ²	Min. Elongation %	Min. Charpy Impact Value J@ -20°C	Young Modules kN/mm ²
Macalloy 460	Carbon Steel	460	610	19	27	205
Macalloy S460	Stainless Steel	460	610	15	27	205
Macalloy 520	Carbon Steel	520	690	19	27	205
Macalloy S520	Stainless Steel	520	690	15	27	205

Tendon Capacities for Carbon and Stainless Macalloy 460																	
Thread	Units	M10	M12	M16	M20	M24	M30	M36	M42	M48	M56	M64	M76	M85	M90	M100	M105
Nominal Bar Dia.	mm	10	11	15	19	22	28	34	39	45	52	60	72	82	87	97	102
Min. Yield Load	kN	25	36	69	108	156	249	364	501	660	912	1204	1756	2239	2533	3172	3520
Min. Break Load	kN	33	48	91	143	207	330	483	665	875	1209	1596	2329	2969	3358	4206	4667
Design Resistance to EC3 N _{R,d}	kN	24	35	66	103	149	238	348	479	630	870	1149	1677	2138	2418	3029	3360
Nominal Bar Weight	kg/m	0.5	0.75	1.4	2.2	3.0	4.8	7.1	9.4	12.5	16.7	22.2	32	41.5	46.7	58	64.1

Tendon Capacities for Carbon and Stainless Macalloy 520																	
Thread	Units	M10	M12	M16	M20	M24	M30	M36	M42	M48	M56	M64	M76	M85	M90	M100	M105
Nominal Bar Dia.	mm	10	11	15	19	22	28	34	39	45	52	60	72	82	87	97	102
Min. Yield Load	kN	28	41	78	122	176	284	412	567	746	1031	1361	1986	2563	2863	3586	3979
Min. Break Load	kN	38	55	103	162	234	374	546	752	990	1368	1806	2635	3401	3799	4758	5279
Design Resistance to EC3 N _{R,d}	kN	27	39	74	117	168	269	393	541	713	985	1300	1897	2449	2735	3426	3801
Nominal Bar Weight	kg/m	0.5	0.75	1.4	2.2	3	4.8	7.1	9.4	12.5	16.7	22.2	32	41.5	46.7	58	64.1

M85 to M100 in stainless and M105 in both systems are not covered by ETA but are available by special request

Maximum Length of Individual Bars			
Diameter	Stainless Steel	Carbon	Galvanised
M10 - M16	6.0m	11.95m	6.0m
M20 - M30	6.0m	11.95m	8.0m
M36 - M105	6.0m	11.95m	11.95m

Longer lengths can be supplied as made to order if required.

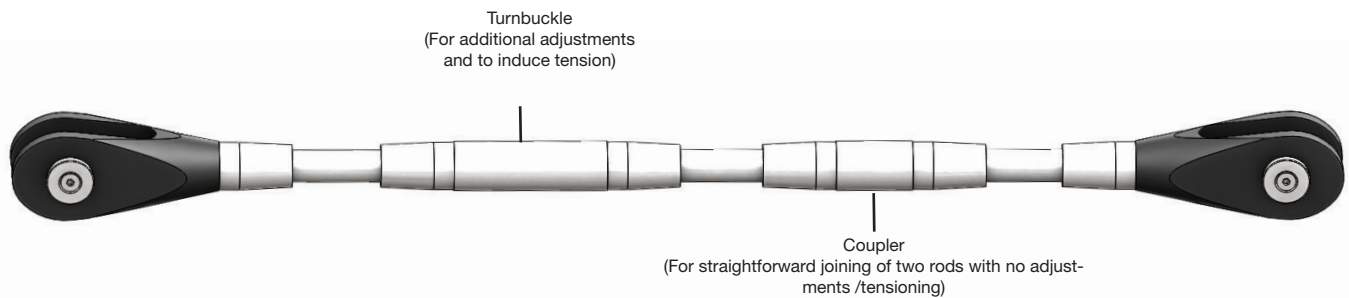
Corrosion Protection

Carbon steel tension bars can be supplied primed and ready for an appropriate paint covering or galvanised. Galvanising can be applied prior to, or after, bar threading as required. Please note that all standard carbon Macalloy fittings (forks, pins and Lock Covers) are provided with a hot dipped galvanised coating in accordance with BS EN 1461: 2009

Fatigue

Threads are rolled on to the bar and are therefore more resistant to fatigue. Testing a range of diameters has been carried out over 2 million cycles, the results of which are available from the macalloy technical department.

Final Assembly Example



Fork Adjustment and Set Up Points

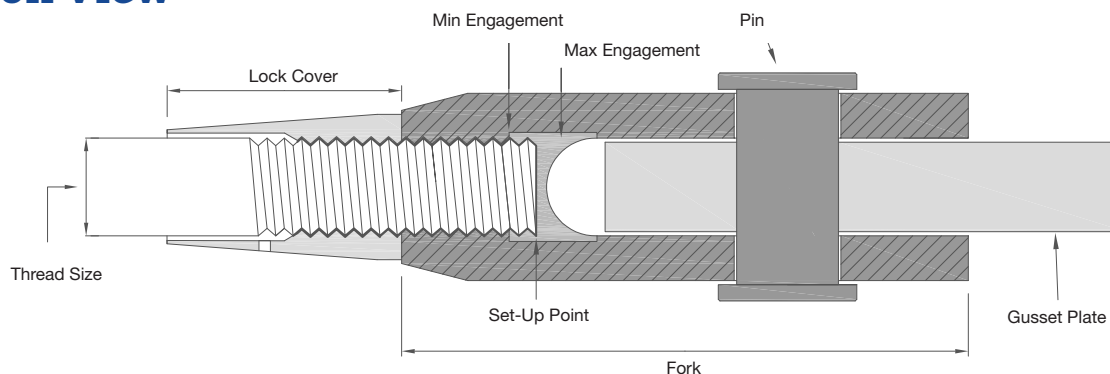
Fork Adjustment – M10 to M56: $\pm 1/2$ thread diameter in each fork end.

Fork Adjustment – M64 to M100: ± 25 mm in each fork end.

Set-Up Point – M10 to M56: $1\frac{1}{2}$ x thread diameter in each fork end.

Set-Up Point – M64 to M100: 1 x thread diameter plus 25mm in each fork end.

Section View



Turnbuckle Adjustment and Set Up Points

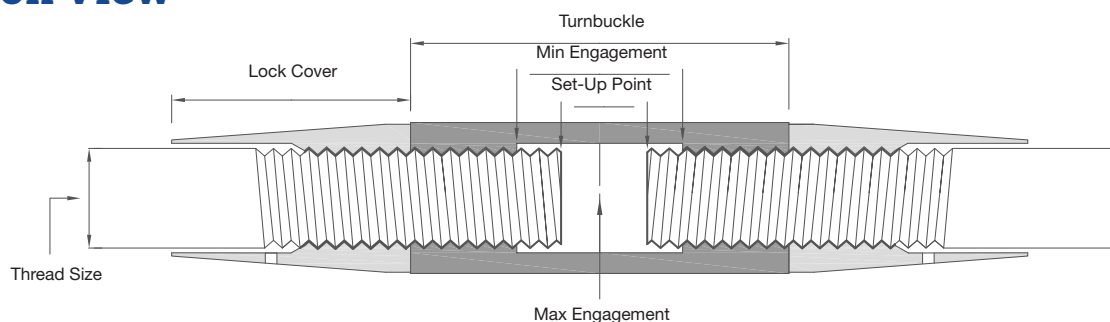
Turnbuckle Adjustment – M10 to M24: ± 25 mm.

Turnbuckle Adjustment – M30 to M100: ± 50 mm.

Set-Up Point – M10 to M24: 1 x thread diameter + 12.5mm in each end of the turnbuckle.

Set-Up Point – M30 to M100: 1 x thread diameter + 25mm in each end of the turnbuckle.

Section View



Tension Rods

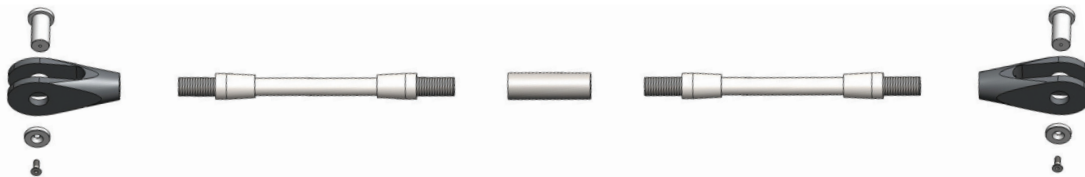
Assembly and Installation

For both pre-assembled and non-assembled tendons please follow the assembly and installation instructions to ensure correct set up points and thread engagement.

- 1 Note the thread direction of each bar end.



- 2 Screw tapered Lock Covers on to the bar as far as thread allows with taper pointing away from fork, coupler or turnbuckle.



- 3 Screw forks, turnbuckles and couplers on to bars noting set up points on page 5. Couplers should be fully engaged.

- 4 Position bar in place and secure with pins.



- 5 Where no turnbuckle is used, turn the bar to induce the load/adjustment required.

- 6 Where a turnbuckle is used turn the turnbuckle to induce the required load/adjustment

- 7 Screw Lock Covers back against forks/couplers and turnbuckles.



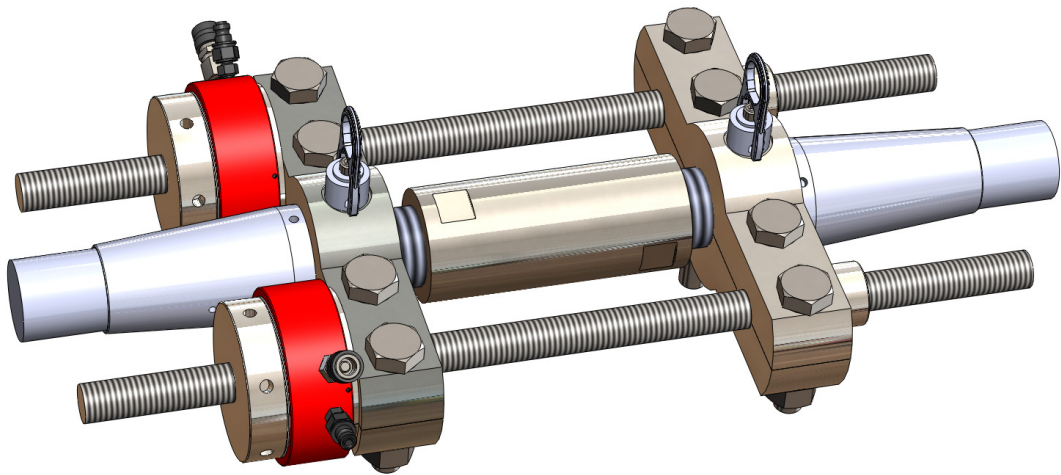
- 8 Seal as per fork and lock cover diagram on page 7.

- 9 Assembly and installation is complete.

- To ensure full strength of threaded joints a minimum of 1 x thread diameter should be engaged in fork/turnbuckle joints.
- Where large loads need to be induced in a tension bar the Macalloy TechnoTensioner can be used. See page 7 for more information.
- Spanner flats available on request on bars and turnbuckles, please specify at time of order.

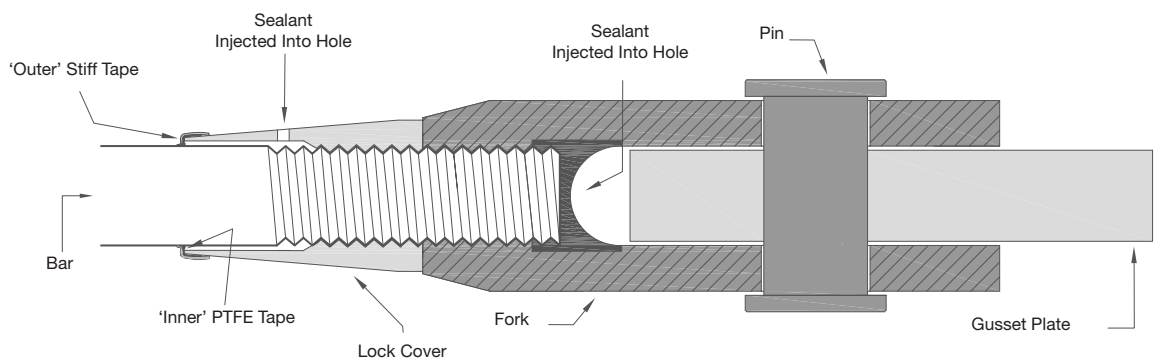
TechnoTensioner

The Macalloy TechnoTensioner is hydraulic acting equipment which allows you to induce an accurate load into Macalloy tendons where a turnbuckle is used. The Macalloy TechnoTensioner works by gripping the tension bars on either side of the turnbuckle and pulling the bars together into tension thus loosening the turnbuckle. The turnbuckle can then be tightened with a strap, chain or stilson wrench.



Fork and Lock Cover Sealing

Recommended for use with all finishes to protect against vibration and corrosion. All lock covers should be sealed whether used with a fork, coupler or turnbuckle.



Fork and Lock Cover sealing method statements are available on our website and on request. If no lock cover is used, an alternative sealing method should be introduced as described in the method statement.

Adjustable Compression Struts

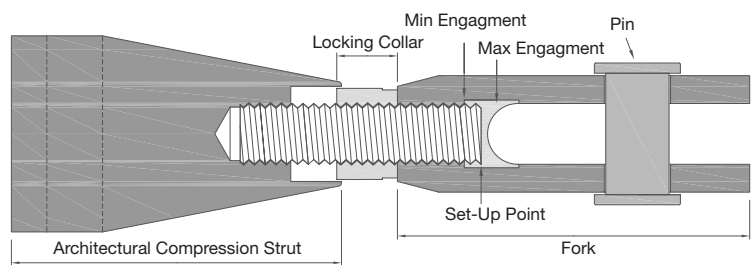
Capacity and Lengths of Architectural and Standard Compression Struts															
System Ref		M12	M16	M20	M24	M30	M36	M42	M48	M56	M64	M76	M85	M90	M100
Maximum Compressive Capacity to EN1993	kN	14.0	28.1	44.7	69.3	121.6	189.6	274.0	369.7	530.0	728.7	1063.9	1395.3	1588.6	2031.3
Maximum Pin to Pin Length on EN1993 Standard*	mm	2369	2663	2671	3105	3357	3367	4498	6397	7097	7420	8188	9323	10291	11679
Carbon CHS OD	mm	33.7	42.4	48.3	60.3	76.1	88.9	114.3	139.7	168.3	193.7	219.1	244.5	273	323.9
Carbon CHS Wall Thickness	mm	4	5	5	5	5	5	6.3	10	10	10	12.5	16	16	16
Stainless CHS OD	mm	33.40	42.16	48.30	60.33	73.03	Contact Macalloy for details								
Stainless CHS Wall Thickness	mm	4.50	4.85	5.08	5.08	5.16									

*Maximum lengths are based on carbon steel strut taking the maximum compressive capacity. For lower compressive loads longer lengths can be used. Alternative wall thicknesses are available. Contact Macalloy for details regarding maximum length of stainless steel struts.

Compression Strut Examples



Fork Adjustment and Set Up






Adjustment with each fork:
M12 to M56: +/- ½ thread diameter
M64 to M100: +/- 25mm
Set-Up Point in each fork
M12 to M56: 1 ½ x thread diameter
M64 to M100: 1 x thread diameter + 25mm

Corrosion Protection

Compression Struts can be supplied galvanised, or in stainless steel.

Assembly and Installation

- 1 Remove pins using an allen key, position the strut in place and secure with pins, tightening using an allen key.

- 2 Screw the locking collar in to the strut so only a small part of the locking collar is left visible, then turn the strut to the required position.

- 3 Screw the locking collar back against the fork. All the thread should be covered. The forks should be sealed as per the diagram on page 7.


Capacity of Macalloy Fixed End Compression Struts																
Macalloy Product Ref		Units	CSF 33.7	CSF 42.4	CSF 48.3	CSF 60.3	CSF 76.1	CSF 88.9	CSF 114.3	CSF 139.7	CSF 168.3	CSF 193.7	CSF 219.1	CSF 244.5	CSF 273.0	CSF 323.9
Equivalent Macalloy Fork Size			M12	M16	M20	M24	M30	M36	M42	M48	M56	M64	M76	M85	M90	M100
CHS Size to fit	Outer Diameter	mm	33.7	42.4	48.3	60.3	76.1	88.9	114.3	139.7	168.3	193.7	219.1	244.5	273	323.9
	Wall Thickness	mm	4.0	5.0	5.0	5.0	5.0	5.0	6.3	10.0	10.0	10.0	12.5	16.0	16.0	16.0
Compressive Capacity to EN 1993		kn	52	99	122	174	272	374	534	735	1048	1437	2127	2723	3110	3686
Gusset Plate Thickness		mm	10	12	15	20	22	30	35	40	45	55	70	70	80	85
Weight		kg	0.25	0.51	1.0	1.4	2.4	3.7	6.2	10.8	15.8	20.5	40.3	59.3	74.0	100.0

Macalloy CHS Fork End



Corrosion Protection

Can be galvanised and or painted and supplied in stainless steel to special order.

Assembly and Installation

- 1 Insert Macalloy CHS Fork End into CHS / tube, ensuring it is fully inserted and that the forks are parallel to each other.



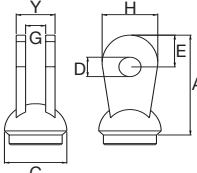
- 2 Weld directly to CHS with full penetration butt weld and clean weld as required (ensuring forks are parallel to each other)



- 3 Position complete strut in place and secure using pins.






Architectural pins can be supplied by Macalloy. Please refer to table number 12 on page 13 for further information.

Macalloy CHS Fork End Dimensions																
System Ref	Product Ref.	Units	CSF 33.7	CSF 42.4	CSF 48.3	CSF 60.3	CSF 76.1	CSF 88.9	CSF 114.3	CSF 139.7	CSF 168.3	CSF 193.7	CSF 219.1	CSF 244.5	CSF 273.0	CSF 323.9
Fixed End Compression Strut Fork 	A	mm	75	95	109	130	161	185	218	255	303	340	398	462	495	574
	G (min.)	mm	13	16	20	25	30	35	40	45	49.5	59.5	76	76	86	91
	C Dia.	mm	33.7	42.4	48.3	60.3	76.1	88.9	114.3	139.7	168.3	193.7	219.1	244.5	273	323.9
	D Dia	mm	13	17	21.5	25.5	31.5	37.5	43.5	49.5	57.5	65.5	78.5	91.5	96.5	111.5
	E	mm	22	29	34	42	52	61	70	81	97	111	132	153	162	189
	Y	mm	22	28	37	44	53	64	75	87	97.5	115.5	146	153	169	174
	H	mm	34	45	53	64	81	93	109	123	147	169	201	236	248	289

Stainless Cables SC460

Minimum Break Loads for Stainless Cables												
Cable Dia.	mm	4	6	8	10	12	14	16	19	22	26	28
Macalloy Fork Size		M10	M10	M12	M16	M20	M24	M24	M30	M30	M36	M36
7 x 19 Strand	kN	8.9	20.0	35.6	55.6	80.0	109.0	143.1	-	-	-	-
1x 19 Strand	kN	12.6	28.2	45.5	71.1	102.0	139.0	182.0*	212.0*	285.0*	398.0*	-
Compact Strand	kN	17.4	34.8	60.3	95.0	141.2	189.2	251.0	-	-	-	510

7 x 19 Strand		Most Flexible	Lowest Break Load	Highest Stretch Characteristics
1 x 19 Strand		Rigid Cable	High Break Load	Low Stretch Characteristics
Compact Strand		Most Rigid	Highest Break Load	Lowest Stretch Characteristics

Stainless steel cable will begin to distort at around 50% of its breaking load. For this reason it is recommended to apply a factor of safety of 2 and not to load the cables to more than 50% of their breaking loads. *1 x 37 or 1 x 61 may also be offered.

Cable Systems - Swaged Adjustable Fork



Cable Systems - Swaged Fork / Tensioner Assembly and Installation

- 1 Remove pins using supplied allen key and screw Lock Covers away from tensioners as far as the thread will allow.



- 2 Position cable in place and secure with pins, tightening with supplied allen key. For Swaged fork tensioning use open ended spanner on each adjuster and simultaneously turn each one to induce load / adjustment.



- 3 Swaged Tensioner and Inline Tensioner Adjustment – Turn tensioner using open ended spanner until correct level of adjustment tension is achieved. Then screw Lock Covers back against the tensioners.



Where large loads need to be induced in a cable, a version of the Macalloy TechnoTensioner can be used. Refer to page 7 for further information.

Cable Stretch

Cables undergo an initial, permanent stretch (construction stretch). This can be between 0.10% and 0.75% dependant on the loading and type of cable. Further elastic stretch will then be proportional to the load applied and cable used. Elastic stretch can be calculated using the following formula:

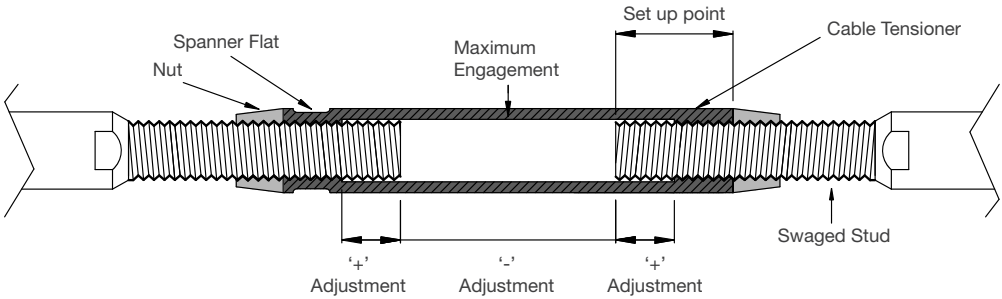
$$d = \frac{\text{Load (kN)} \times \text{Length (mm)}}{E \text{ (kN/mm}^2\text{)} \times \text{Cross Section Area (mm}^2\text{)}}$$

Cable Type	kN/mm²
7 x 19 Strand	85
1 x 19 Strand	107
Compact Strand	133

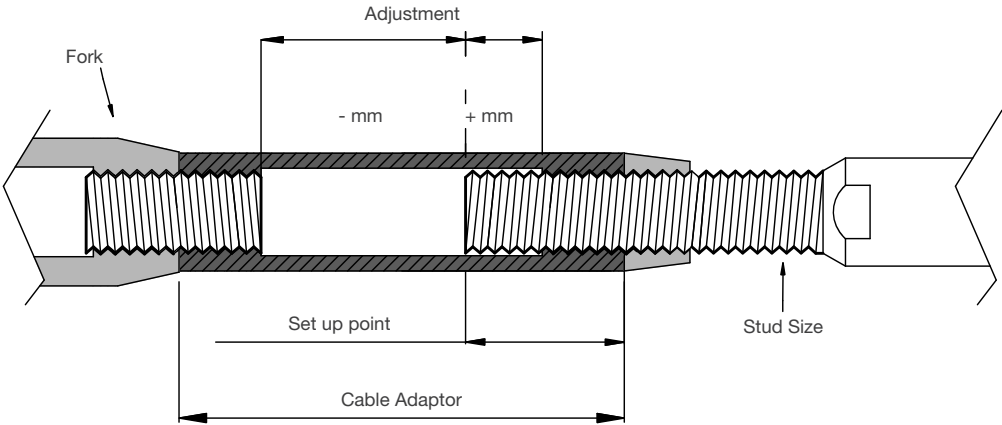
All cables are supplied non pre-stretched, if pre-stretched cables are required please request at time of the enquiry or order.

Fork Adjustments

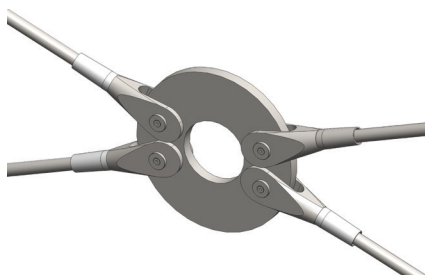
Fork-Cable Adaptor Adjustment												
Cable Dia.	Units	4	6	8	10	12	14	16	19	22	26	28
Fork Adjustment '+'	mm	9	14	17	22	25	31	31	38	38	45	45
Fork Adjustment '-'	mm	19	28	33	44	49	61	61	76	76	91	91
Set-up Point	mm	15	24	29	38	45	55	55	68	68	81	81



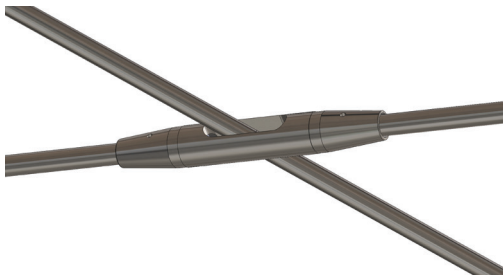
Swaged Tensioner and Inline Tensioner Adjustment												
Cable Dia.	Units	4	6	8	10	12	14	16	19	22	26	28
Tensioner Adjustment '+'	mm	23	23	27	35	39	61	61	81	81	77	77
Tensioner Adjustment '-'	mm	47	47	53	69	79	121	121	161	161	153	153
Set-Up Point	mm	22	22	26	34	40	55	55	71	71	75	75



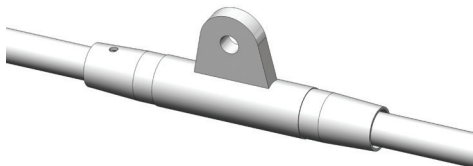
Connection Solutions



Disc Connection



Cross Coupler



Turnbuckle with Fin Plate

Disc Connection										
Connection Disc	D/10	D/12	D/16	D/20	D/24	D/30	D/36	D/42	D/48	D/56
System Size	M10	M12	M16	M20	M24	M30	M36	M42	M48	M56
ØD	130	164	218	248	294.8	386	444	502	572	694
ØI	96	120	160	180	210	280	320	360	410	500
T	10	10	12	15	20	22	30	35	40	45
ØP	11.5	13	17	21.5	25.5	31.5	37.5	43.5	49.5	57.5
ØH (optional)	50	70	90	105	115	160	185	205	235	290

Cross Coupler											
Cross-Coupler	CC10	CC12	CC16	CC28	CC24	CC30	CC36	CC42	CC48	CC56	CC64
System Size	M10	M12	M16	M20	M24	M30	M36	M42	M48	M56	M64
A	73	82	105	128	148	183	21	249	283	328	376
B	47	52	67	82	94	117	139	159	181	210	242
C	12	14	18	22	26	32	38	44	50	58	66
ØD	19	25	29	35	43	52	62	72	82	96	110
Lock Cover	LCC10	LCC12	LCC16	LCC20	LCC24	LCC30	LCC36	LCC42	LCC48	LCC56	LCC64
System Size	M10	M12	M16	M20	M24	M30	M36	M42	M48	M56	M64
E	29	31	37	43	74	105	111	117	123	136	144
ØF	18.5	24	28	34	42	51	61	71	81	95	109

Turnbuckle with Fin Plate										
Connection Disc	D/10	D/12	D/16	D/20	D/24	D/30	D/36	D/42	D/48	D/56
System Size	M10	M12	M16	M20	M24	M30	M36	M42	M48	M56
ØD	130	164	218	248	294.8	386	444	502	572	694
ØI	96	120	160	180	210	280	320	360	410	500
T	10	10	12	15	20	22	30	35	40	45
ØP	11.5	13	17	21.5	25.5	31.5	37.5	43.5	49.5	57.5
ØH (optional)	50	70	90	105	115	160	185	205	235	290

Bespoke connection

Bespoke connection pieces including personalisation are also available. Please contact Macalloy for further details.

Component Dimensions

Thread	Units	M10	M12	M16	M20	M24	M30	M36	M42	M48	M56	M64	M76	M85	M90	M100	
Fork Ref.		FA/10	FA/12	FA/16	FA/20	FA/24	FA/30	FA/36	FA/42	FA/48	FA/56	FA/64	FA/76	FA/85	FA/90	FA/100	
A	mm	63.0	75.0	99.0	122.0	148.0	178.0	204.0	232.0	266.0	314.0	348.0	410.0	459.0	489.0	555.0	
G	mm	11.0	12.0	15.0	19.0	24.0	26.0	34.0	39.0	44.0	49.0	56.0	76.0	78.0	86.0	91.0	
C	mm	17.0	19.0	25.0	29.0	35.0	44.0	52.0	60.0	69.0	80.0	91.0	108.0	121.0	129.0	143.0	
D	mm	11.5	13.0	17.0	21.4	25.5	31.5	37.5	43.5	49.5	57.5	65.5	78.5	91.5	96.5	111.5	
E	mm	18.0	22.0	29.0	34.0	42.0	53.0	61.0	70.0	81.0	97.0	111.0	132.0	153.0	162.0	188.0	
Y	mm	20.0	22.0	28.0	37.0	44.0	50.0	64.0	75.0	87.0	97.0	115.0	146.0	154.0	169.0	174.0	
H	mm	30.0	34.0	45.0	53.0	64.0	81.0	93.0	109.0	123.0	147.0	169.0	201.0	236.0	248.0	289.0	
Spade ref.		SA/10	SA/12	SA/16	SA/20	SA/24	SA/30	SA/36	SA/42	SA/48	SA/56	SA/64	SA/76	SA/85	SA/90	SA/100	
B	mm	78.0	92.0	118.0	147.0	174.0	213.0	249.0	284.0	321.0	364.0	408.0	471.0	524.0	555.0	625.0	
T	mm	8.0	9.0	12.0	15.0	20.0	22.0	30.0	35.0	40.0	45.0	55.0	70.0	72.0	80.0	85.0	
Architectural Pin Ref.		PA/10	PA/12	PA/16	PA/20	PA/24	PA/30	PA/36	PA/42	PA/48	PA/56	PA/64	PA/76	PA/85	PA/90	PA/100	
P Dia.	mm	10.5	12.0	16.0	20.0	24.0	29.0	35.0	41.0	47.0	55.0	63.0	76.0	90.0	93.0	108.0	
L	mm	22.0	24.0	30.0	39.0	46.0	52.0	66.0	78.0	91.0	100.0	120.0	151.0	155.0	175.0	180.0	
Turnbuckle Ref.		TA/10	TA/12	TA/16	TA/20	TA/24	TA/30	TA/36	TA/42	TA/48	TA/56	TA/64	TA/76	TA/85	TA/90	TA/100	
ØD	mm	17.0	19.0	25.0	29.0	35.0	43.0	52.0	60.0	58.0	80.0	91.0	108.0	121.0	129.0	143.0	
C	mm	50.0	50.0	50.0	50.0	50.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	
L	mm	74.0	78.0	86.0	90.0	98.0	160.0	172.0	184.0	196.0	212.0	228.0	252.0	270.0	280.0	300.0	
Coupler Ref.		CA/10	CA/12	CA/16	CA/20	CA/24	CA/30	CA/36	CA/42	CA/48	CA/56	CA/64	CA/76	CA/85	CA/90	CA/100	
ØD	mm	17.0	19.0	25.0	29.0	35.0	43.0	52.0	60.0	68.0	80.0	91.0	108.0	121.0	129.0	143.0	
L	mm	25.0	29.0	37.0	45.0	53.0	65.0	77.0	89.0	101.0	117.0	133.0	157.0	175.0	185.0	205.0	
Lock Covers		LTC/10	LTC/12	LTC/16	LTC/20	LTC/24	LTC/30	LTC/36	LTC/42	LTC/48	LTC/56	LTC/64	LTC/76	LTC/85	LTC/90	LTC/100	
X Dia.	mm	16.5	18.5	24.0	28.0	34.0	42.0	51.0	59.0	67.0	79.0	90.0	107.0	120.0	128.0	142.0	
N	mm	44.0	44.0	46.0	48.0	92.0	126.0	134.0	145.0	153.0	169.0	179.0	191.0	200.0	205.0	215.0	



Parliament Library

New Delhi, India

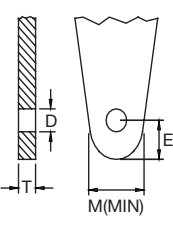
Architect: Raj Rewal Associates

Client: Parliament of India

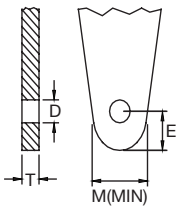
Fork Alignment & Site Services

Gusset plates should be manufactured from material with a minimum strength of S355 to BS EN 10025 with the critical dimensions around the pin hole as per the tables below, noting the use of isolation when carbon gusset plates are used with stainless tendons.

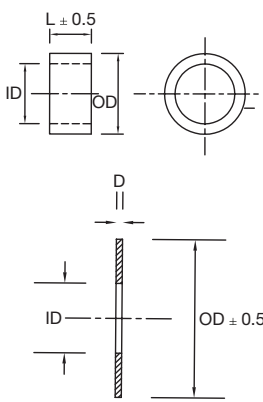
Macalloy Standard Gusset Plate Dimensions																
		M10	M12	M16	M20	M24	M30	M36	M42	M48	M56	M64	M76	M85	M90	M100
T (Thickness)	mm	10	10	12	15	20	22	30	35	40	45	55	70	70	80	85
D	mm	11.5	13	17	21.5	25.5	31.5	37.5	43.5	49.5	57.5	65.5	78.5	91.5	96.5	111.5
E	mm	18	22	30	37	43	56	64	74	84	101	112	132	160	166	194
H (min.)	mm	28	34	48	60	68	90	103	118	135	163	180	211	259	266	317



Macalloy Gusset Plate Dimensions when used with isolation													
		M10	M12	M16	M20	M24	M30	M36	M42	M48	M56	M64	M76
T (Thickness)	mm	8	9	12	15	20	22	30	35	40	45	55	70
D	mm	15.5	17.0	21.0	25.5	30.0	36.0	42.0	48.0	55.5	63.5	72.5	85.5
E	mm	21	24	31	37	45	56	64	74	85	100	115	136
H (min.)	mm	34	38	49	58	69	89	108	117	136	160	179	210



The above dimensions should be used when connecting stainless forks to a carbon steel connection plate. This then allows space for isolation sleeves and washers. If connecting to a stainless connection plate where no isolation is required, please use dimensions in table 13.

Isolation Dimensions for Macalloy S460														
		M10	M12	M16	M20	M24	M30	M36	M42	M48	M56	M64	M76	
Isolation Sleeve		IS10	IS12	IS16	IS20	IS24	IS30	IS36	IS42	IS48	IS56	IS64	IS71	
Length	mm	9	10	13	16	21	23	31	36	41	46	55	71	
ID	mm	11.5	13.0	17.0	21.0	25.0	31.0	37.0	43.0	39.0	57.0	64.5	77.5	
OD	mm	14.5	16.0	20.0	24.5	29.0	35.0	41.0	47.0	54.0	62.0	71.0	84.0	
Isolation Washer	mm	IW10	IW12	IW16	IW20	IW24	IW30	IW36	IW42	IW48	IW56	IW64	IW76	
D	mm	0.5	0.5	0.5	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	
OD	mm	26	30	41	46	57	74	83	98	110	135	155	190	



Whitelee Wind Farm,

Eaglesham Moor, UK

Architect: Hypostyle

Contractor: Morrison Construction

Fork / Gusset Plate Misalignment



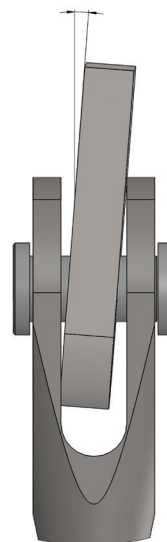
Forks should be kept in plane and parallel to each other on all Macalloy Tension Structure Systems.



Use of horizontal gusset plates should be avoided to prevent loads in gusset plates due to bar weight.

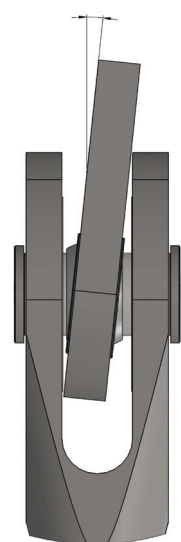
The standard Macalloy fork allows for misalignment between gusset plates of up to 0.5° . Where greater adjustment is required or there is potential movement exceeding 0.5° , larger forks can be put on the bar or strut and a spherical bearing can be inserted providing up to 5.9° of misalignment / movement.

Max = 0.5°



Standard Arrangement

Max = 5.9°



Additional misalignment with spherical bearing

Macalloy Site Services

Site support – Macalloy site services personnel can provide on site support in the form of undertaking stressing, training local personnel and providing supervision.

Equipment Hire – Macalloy Site services can provide a range of equipment to assist with the installation of tension bars including hydraulic jacks, Macalloy TechnoTensioner, strap and chain wrenches and strain gauges.

Bespoke Systems

Macalloy can supply a range of special items, including but not limited to:

- Higher strength tension bar – up to 690 N/mm^2 minimum yield strength
- Larger diameter tension bars
- Bespoke cast and fabricated connection pieces
- Spade Connections
- Oversized forks or spades on smaller diameter bars, cables or struts

Engineering Support

Macalloy engineering team can provide support and advice on a range of issues including fire protection, thermal expansion, installation/stressing and managing misalignment and movement.

University of Minnesota

USA

Architects: HGA, KPF



Troja Bridge

Czech Republic

Steel Work Designer - Excon Steel

Main Contractor - Metrostav

Dubai Airport

UAE

Engineer: Dar Al-Handasah

Client: Josef Gartner



Mbombela Stadium

Nelspruit South Africa

Client - Mbombela Local Municipality

Structural Engineer - Mott MacDonald

Macalloy

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