

# Clevis & Clevis Turnbuckles

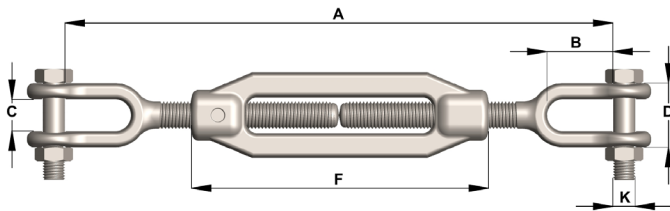
## Product Description

- AS2319 - 2001
- 6:1 Safety Factor
- Grades L, P & S
- Tested and Certified
- Galvanized
- Manufactured using only heat certified Australian Steel (AS1442/AS1444)



### Available on Request

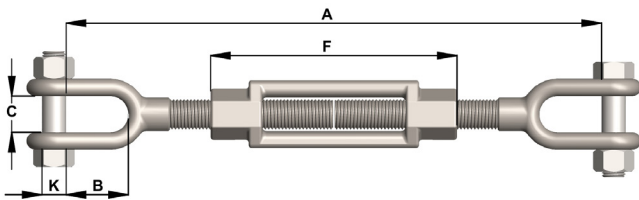
- Locknuts



Townley Drop Forge is both NATA Accredited (Test Lab No. 13554) and AS/NZS ISO9001 Certified (Certificate number FS 604897)..

### Dimensions and Working Load Limits (WLL) Metric - Grades L , P & S

Nominal Size	A Closed	A Open	B	C	D	F	K	Grade L WLL	Grade P WLL	Grade S WLL
M10	240	350	30	14	30	150.0	10	0.3t	0.6t	0.8t
M12	335	470	36	15	35	190.5	10	0.5t	1t	1.2t
M16	355	490	45	20	40	204.0	12	0.75t	1.6t	2t
M20	440	580	46	22	46	216.5	16	1.25t	2.5t	3.2t
M24	440	585	59	30	58	232.0	20	2.5t	4t	5t
M33	630	780	78	38	76	252.0	27	5t	8t	10t



### Dimensions and Working Load Limits (WLL) BSW - Grade L

Nominal Size	A Closed	A Open	B	C	F	K	Grade L WLL
1 1/4"	520	670	70	38	255	25	5t
1 1/2"	550	740	70	48	275	32	6t

Subject to technical modifications

# Clevis & Eye Turnbuckles

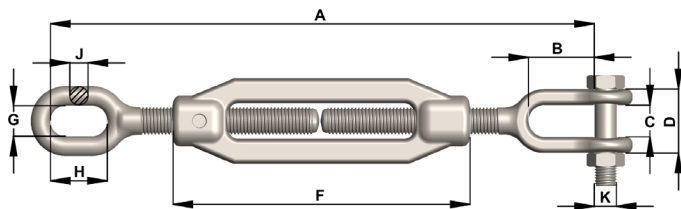
## Product Description

- AS2319 - 2001
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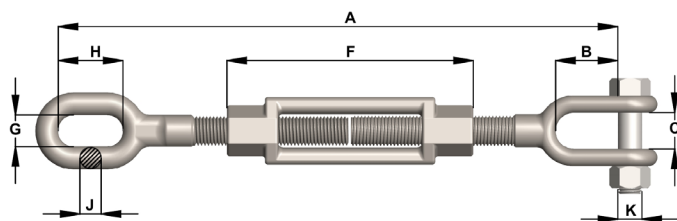
- Lock Nuts



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### Dimensions and Working Load Limits (WLL) - Metric - Grades L , P & S

Nominal Size	A Closed	A Open	B	C	D	F	G	H	J	K	Grade L WLL	Grade P WLL	Grade S WLL
M10	235	340	30	14	30	150	11	21	7	10	0.3t	0.6t	0.8t
M12	330	470	36	15	35	190.5	15	30	9	10	0.5t	1t	1.2t
M16	355	490	45	20	40	204	17	36	12	12	0.75t	1.6t	2t
M20	390	520	55	22	46	215.5	21	42	14	16	1.25t	2.5t	3.2t
M24	445	580	59	30	58	232	25	51	17	20	2.5t	4t	5t
M33	643	793	78	38	76	252	33	70	24	27	5t	8t	10t



### Dimensions and Working Load Limits (WLL) - BSW

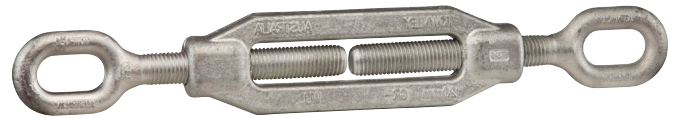
Nominal Size	A Closed	A Open	B	C	F	G	H	J	K	Grade L WLL
1 1/4"	525	690	70	38	255	33	67	22	25	5t
1 1/2"	570	740	70	48	275	38	72	25	32	6t

Subject to technical modifications

# Eye & Eye Turnbuckles

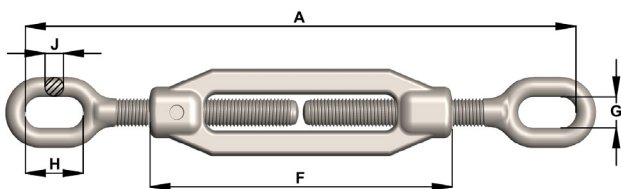
## Product Description

- AS2319 - 2001
- 6:1 Safety Factor
- Grades L, P & S
- Tested and Certified
- Galvanized
- Manufactured using only heat certified Australian Steel (AS1442/AS1444)



### Available on Request

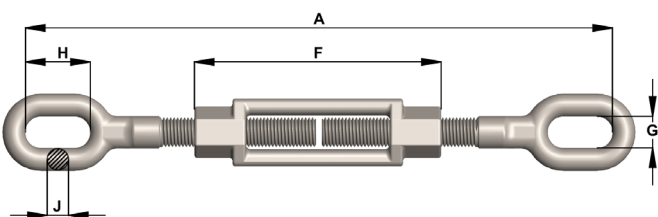
- Locknuts



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### Dimensions and Working Load Limits (WLL) Metric - Grades L, P & S

Nominal Size	A Closed	A Open	F	G	H	J	Grade L WLL	Grade P WLL	Grade S WLL
M10	230	335	150.0	11	21	7	0.3t	0.6t	0.8t
M12	330	470	190.5	15	30	9	0.5t	1t	1.2t
M16	350	485	204.0	17	36	12	0.75t	1.6t	2t
M20	385	515	216.5	21	42	14	1.25t	2.5t	3.2t
M24	440	570	232.0	25	51	17	2.5t	4t	5t
M33	656	806	252.0	33	70	24	5t	8t	10t



### Dimensions and Working Load Limits (WLL) BSW - Grade L

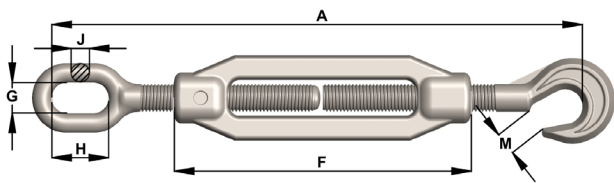
Nominal Size	A Closed	A Open	F	G	H	J	Grade L WLL
1 1/4"	570	720	255	33	67	22	5t
1 1/2"	600	740	275	38	72	25	6t

Subject to technical modifications

# Hook & Eye Turnbuckles

## Product Description

- Heavy Duty
- Galvanized Body
- Manufactured using only heat certified Australian Steels (AS1442/AS1444)



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Nominal Size	A Closed	A Open	F	G	H	J	M
M10	245	345	150.0	11	21	7	12
M12	325	465	190.5	15	30	9	14
M16	355	495	204.0	17	36	12	20
M20	400	530	216.5	21	42	14	23
M24	445	580	232.0	25	51	17	25

# Stub & Stub Turnbuckles

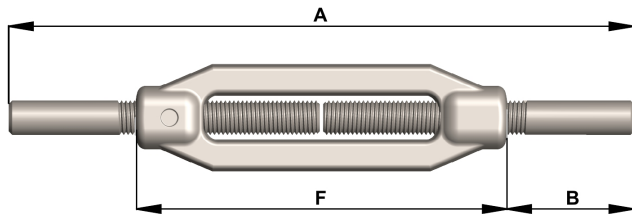
## Product Description

- Heavy Duty and Rated
- Galvanized Body
- Design Loads in accordance with AS4100
- Stub Ends G300 Mild Steel (AS/NZS 3679.1-300) - Weldable Hot Rolled Structural Steel
- Manufactured using only heat certified Australian Steels (AS1442/AS1444)
- Welding shall be to recommended welding instructions



### Available on Request

- Conformance Certificate (Body Only)

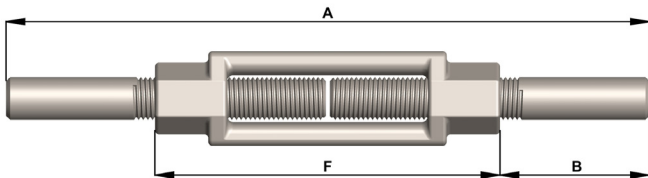


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### Dimensions and Working Load Limits (WLL) – Metric

Nominal Size	WLL (stamped)	Stub UTS*	Body UTS	A Closed	A Open	B	F	Weight (kg)	Part No.
M10	0.3t	21kN	47kN	265	375	55	150	0.5	TBSS10
M12	0.5t	30kN	71kN	335	475	70	191	0.8	TBSS12
M16	0.75t	55kN	118kN	365	495	72	204	1.2	TBSS16
M20	1.25t	86kN	189kN	365	500	79	217	2	TBSS20
M24	2.5t	124kN	295kN	400	535	89	232	3.12	TBSS24
M33	5t	197kN	471kN	400	554	74	252	5	TBSS33
M36	6t	287kN	530kN	550	740	160	275	7.2	TBSS36

\*  $\Phi = 0.8$  Capacity factor applied in accordance with Table 3.4 of AS4100



### Dimensions and Working Load Limits (WLL) - Imperial

Nominal Size	WLL (stamped)	Stub UTS*	Body UTS	A Closed	A Open	B	F	Weight (kg)	Part No.
1.1/4"	5t	197kN	471kN	415	565	70	255	4.61	TBSS1250
1.1/2"	6t	287kN	589kN	550	740	160	275	8.25	TBSS1500

\*  $\Phi = 0.8$  Capacity factor applied in accordance with Table 3.4 of AS4100

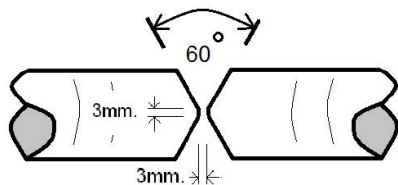
Subject to technical modifications

# Stub & Stub Turnbuckles

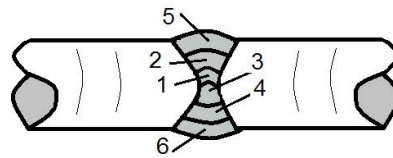
## Welding Procedure

**Important: Welding should be carried out by a suitably qualified person using the guidelines of AS1554.1: 2014**

WPS Number:	TFWP-5 Stub Welding
Code:	Pre-qualified to AS 1554.1, 2014, "Welding of Steel Structures"
Material:	AS 3679.1 Grade 300 Steel
Joint Type:	Double V Butt
Joint Identification:	B-C 3
Welding Position:	Flat 1G
Range Qualified:	W.P.S. covers 10 mm. to 40 mm. Diameters in the Flat 1G position



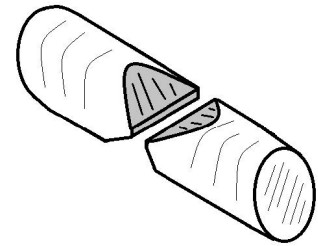
Joint Preparation



Run Position

## Preparation

- Remove contaminants from the weld area by grinding and wire brush.
- Preparation method: Grinding and wire brushing.
- Root Face: 2-3 mm., Root Gap: 2-3 mm., Included Angle: 60°
- Align joint and tack components.
- Back-grind first run to expose clean metal.



## Welding

Welding Process	Consumable	Consumable Size	Amperage	Voltage	Shielding Gas
MMAW	AS 4855 B E4916 AUH10	3.2 mm	115-130	-	-
GMAW	AS 2717.1 ES4-GC/M-W503AH	0.9 mm	135-165	18-22	Argon + 16-18% CO2
FCAW	AS 2203.1 ETP-GC/Mp-503A.CM1 H10	1.2 mm	135-185	27-31	Argon + 16-18% CO2

N.B. Grind weld ends on completion if required. Do not quench.

## Destructive Examination

- One Macro to AS 1554.1 SP requirements on a test bar.

## Non-Destructive Examination

- Visual scanning 100%.
- Visual compliance to AS 1554.1 SP requirements.
- N.D.T. as agreed with client.

Procedure prepared by: Ron Mays (Weld. Supv.7152, Weld. Insp.7682) Date: 4/8/13

# Stub & Stub Turnbuckles

## Care in Use

- Where components are interfaced, they should readily connect and freely articulate, to ensure that loading will be applied in tension.
- Care should be taken to ensure that rigging screws and turnbuckles are not excessively tightened beyond the specified rating in tension.
- Regular inspection is required by a competent person.
- Threads should be protected from corrosion by effective means.
- The Rigging Screw or Turnbuckle should be removed from service if it has a damaged screw thread, distorted body, distorted fitting, nicks, gouges, cracks or corrosion.

## Grade

Rigging Screws and Turnbuckles manufactured in accordance with Australian Standard AS 2319 are available in various Grades L, P and S.

## Proof Testing

Townley Provides mandatory NATA Test Certificates for proof testing.

## Stub End Turnbuckles

- The Working Load Limit (WLL) is only valid if the welder is suitably qualified and the weld procedure provided by Townley Drop Forge Pty Ltd is strictly adhered to.
- Welding should be carried out by a suitably qualified person using the guidelines of AS1554.1: 2014
- The material to which the stub ends will be welded should be of adequate strength to withstand forces during tension
- The connecting surfaces must be free from contaminants, dirt, oil, paint, etc.
- Before installation and every use, visually inspect the turnbuckle assembly. Discard if there is evidence of corrosion, wear, weld cracks and deformation
- No modification should be made to the assembly
- Do not use under chemical influence such as acids, alkaline solutions and vapours. i.e. in or around pickling baths, hot dip galvanizing plants, etc.
- Do not weld galvanized surfaces

## Locking of Threads

Where rigging screws or turnbuckles are to be used in a permanently adjusted position and where a guy is subjected to shock vibration or rope spin it is necessary to prevent the screws from unwinding. Typical methods of locking threads include locknuts, locking plates and wire.

Locknuts, fitted at the ends of the body, are a method of locking, but may not provide positive or reliable locking under all circumstances, such as due to rope spin. Care should be taken to not induce excessive torque during tightening.

## Load Rating

Rigging Screws and Turnbuckles in accordance with Australian Standards have a safety factor of 6:1. This safety factor helps to counter possible problems from shock, vibration, fatigue, wear, damage and corrosion. This safety factor must be maintained.

When tested to destruction, components must demonstrate ductility. This is achieved if the failed component achieves at least 15% elongation at break.

## Working Load Limit (WLL)

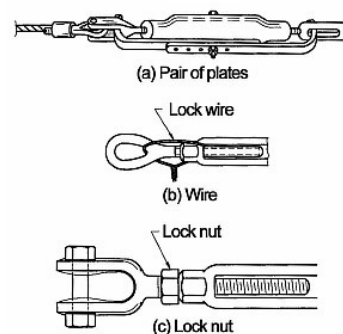
The WLL may be de-rated for particular conditions of use. The strength of components is adversely affected by excessively elevated temperatures. Where the temperatures are likely to exceed 200°C, the following relevant reduction of WLL is advised:

Temperature °C	Temporary reduction of WLL while heated, percent
≤200	No reduction
>200 ≤300	25
>400	Do not use

## Marking

Rigging Screws and Turnbuckles to AS 2319 will have the following markings:

- a) Manufacturer's Identification
- b) Nominal size
- c) The Quality Grade i.e. Grade L
- d) WLL in tonnes
- e) Identification Marking to correlate the Rigging Screw or Turnbuckle to the test certificate



Acceptable Methods of Locking