



Activate your warranty for **FREE** online:

- Formula 4x4 lift kits:
 - **5 year / Unlimited Kilometre** extended warranty
- Bilstein and Raw 4x4 lift kits:
 - **3 year / 60,000km** extended warranty

It's easy, all you must do is visit the below webpage and submit some installation details. This will instantly activate your extended warranty and will cover you nationwide. Scan the QR code to the left or visit the below link.

<https://fulcrumsuspensions.com.au/lift-kit-warranty-activation>

IMPORTANT ACTION*

FILL IN THE BELOW TABLE. THIS FITTING DOCUMENT MUST BE KEPT AT ALL TIMES WITH YOUR VEHICLE ALONGSIDE DOCUMENTS SUCH AS SERVICE & LOGBOOKS FOR ANY WARRANTY PURPOSES.

FULL NAME (First & Last)	INSTALL DATE	INVOICE NUMBER	REGO

Before Lift Kit Install Measurements

Ride Height	Left	Right	Chassis Rake
Front (A)			Front (C)
Rear (B)			Rear (D)

After Lift Kit Install Measurements

Ride Height	Left	Right	Chassis Rake
Front (A)			Front (C)
Rear (B)			Rear (D)

IMPORTANT DISCLAIMER

This document is to help you install a Fulcrum lift kit. The instructions in this document are general in nature. It is highly recommended that you get your lift kit installed by a mechanic or suspension technician, preferably with wheel alignment facilities.

The installer should be experienced mechanically, applying safe work and vehicle lifting practices. Improper practices can lead to serious injury or death. If you are not certain of your ability to safely install the kit, we recommend having it installed at a Fulcrum Suspensions authorised workshop by using our Click & Fit service.

Fulcrum will not warrant or refund any items damaged during the installation of your lift kit if you are found to be at fault.

Serious injury can occur if you install your lift kit incorrectly, do not use the correct tools or choose not to wear the appropriate Personal Protective Equipment (PPE).

Fulcrum Suspensions recommends that you have a sound understanding of suspension and your vehicles sub systems, install the lift kit in a level and safe workshop environment, use the correct tools depending on the application and always wear appropriate PPE.

Upgrade and activate your warranty for **FREE** online:

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A basic video guide can be found at: <https://www.youtube.com/watch?v=mPaq4JnUMVY>



Click & Fit is a great way for you to shop for your suspensions online and get it installed at a local workshop.

If you are unsure about the installation of your lift kit, are having any difficulty or have run into issues. Please call one of our local workshops. The last thing we want is for you to injure yourself or damage your vehicle.

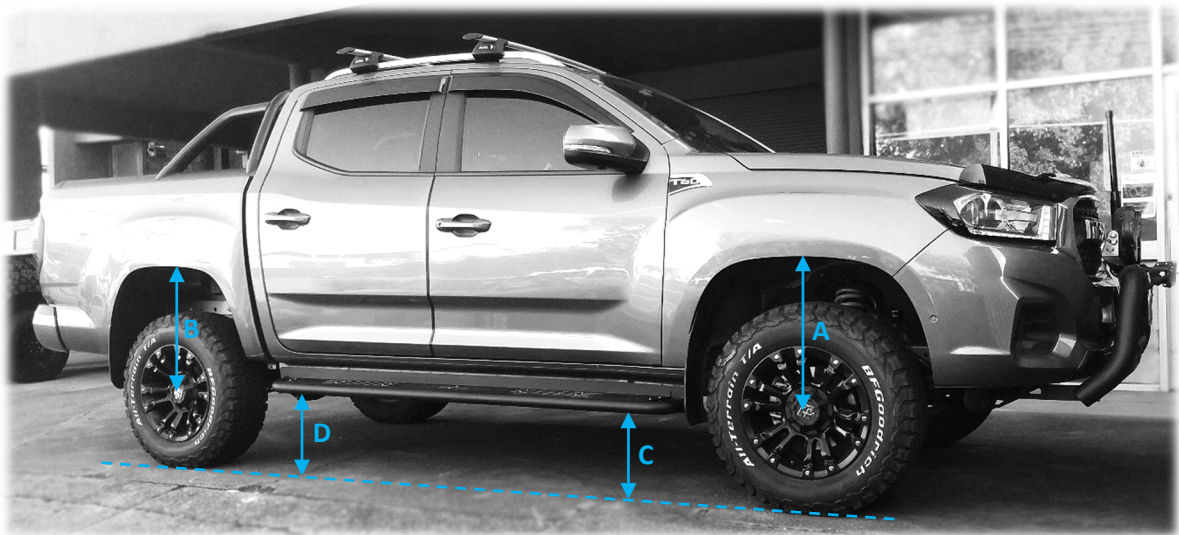
1 INITIAL STEPS FOR ALL VEHICLES

Initial and final measurements and observations are key to ensuring that the installation meets expectations and to allow troubleshooting if there are any issues.

1. Set tyres to the correct pressure.
2. **MEASURE THE RIDE HEIGHT OF THE VEHICLE.** On level ground, measure vertically from the Centre of the Wheel to wheel arch/Guard (CWG), at each wheel as shown below (Point A and B). For trayback vehicles measure from the centre of the hub to the lower edge of the tray. Otherwise, pick a point on the chassis or body that is consistent on both sides.

Ride Height	Left	Right
Front (A)		
Rear (B)		

Chassis Rake
Front (C)
Rear (D)



3. Measure the rake of the vehicle. On smooth and level ground, measure vertically from the ground to the chassis rail, sidestep or body sill of the vehicle, at its foremost and rearmost points (Point C and D).
4. If the vehicle has travelled over 40,000km, perform suspension safety inspection.
5. Check for:
 - a. Rust dust to identify loose components or bolts.
 - b. Chassis damage or cracks
 - c. Chassis rust
 - d. Missing components
6. **PAY PARTICULAR ATTENTION TO SUSPENSION SYSTEM CURRENTLY FITTED.** Formula suspension quoted lift heights for example are relative to the original equipment suspension, if suspension is not original the outcome may be different.
7. Test drive vehicle so you are aware of how the vehicle drives and any existing problems:
 - e. Note any shuddering, particularly when accelerating from a stop.

- f. Note any vibration or humming at cruising speed.
 - g. Note any harshness over bumps, road joints, cats-eyes, etc.
 - h. Note any bouncing/wallowing motion when turning, accelerating and braking.
 - i. Note any clunks, squeaks or other sounds related to suspension motion.
8. Check all supplied kit components are present before commencing work.
9. Inspect all kit components:
 - j. Note any left-side, right-side, passenger-side or drivers-side specific springs and ensure they are fitted in the correct locations.
 - k. If springs are not marked side specific, check both springs side by side and use the tallest spring in the side with the lowest ride height to help correct lean in the vehicle.
 - l. Observe any additional requirements for spring spacers, for example the same as on Toyota KDSS equipped vehicles.

2 INSTALLATION PROCESS FOR ALL VEHICLES

- REFER TO THE GUIDES FOR SPECIFIC VEHICLES AND SUSPENSION TYPES VIA THE FULCRUM SUSPENSIONS WEBPAGE (<https://fulcrumsuspensions.com.au/>).
- Raise vehicle on a hoist, or support on jack stands.
- Fit suspension components one end at a time, referring to the vehicle's workshop manual.
- Formula 4x4 shock absorbers must be fitted with the blue shock absorber body at the bottom, and the black dust cover at the top. **The shock absorber will not function if installed inverted. The vehicle will be dangerous to drive and damage to the shock absorber or vehicle may result.**
- During installation, check for excessive tension on all connections between axles and chassis such as brake lines, ABS cables, handbrake cables and breather hoses at full droop. Some hoses and brackets may need to be temporarily disconnected, DO NOT forget to reconnect them at a later stage if so.
- Torque all bolts and nuts to manufacturers specifications. Replace any bolts where replacement bolts are supplied, or where nominated as "Torque-To-Yield" by the workshop manual.
- All bolts to rubber bushings (control arms, lower strut mounts etc.) must be left approx. one turn loose, and ONLY tightened with the vehicle at ride height, with the full weight of the vehicle on the suspension. Tightening rubber bushes at full droop will cause the bush to tear in use.
- Install any brake line spacers, headlight sensor brackets or driveshaft spacers using the instructions supplied.

3 INSTALLATION TIPS

- When removing or loosening brake calipers or hubs, support the caliper or hub to prevent stretching brake lines and CV shaft boots.
- Beware of wheel speed sensors and wiring, movement of components during installation can stretch and break these **fragile and expensive** components. If possible, it is safest to disconnect the wiring and move it to a safe location before removing any suspension components.
- Beware of suspension position sensors, movement of components during installation can overextend and break these **fragile and expensive** components, most position sensors are either easily removed or have a removable linkage that should be removed before removing any suspension components.

4 FINAL STEPS FOR ALL VEHICLES

1. **MEASURE THE RIDE HEIGHT OF THE VEHICLE.** After the vehicle has **been driven a short distance** and wheel alignment has been performed. Be aware that suspension systems are likely to settle 5 to 10mm in the first 1000km. (This is done using the same procedure as Section 1).

Ride Height	Left	Right
Front		
Rear		

Chassis Rake
Front (C)
Rear (D)

2. Grease any joints if they have grease points.
3. Adjust Brake Proportioning Valve, if fitted or needed.
4. Adjust headlight aim or fit headlight correction bracket, if required.
5. Test drive vehicle:
 - a. Note any shuddering, particularly when accelerating from a stop.
 - b. Note any vibration or humming at cruising speed.
 - c. Note any harshness over bumps.
 - d. Note any bouncing/wallowing motion when turning, accelerating and braking.
 - e. Note any clunks, squeaks or other sounds related to suspension motion.
6. **Wheel alignment should be performed as soon as possible.** Independent suspension vehicles often exhibit large changes in wheel alignment with changes in ride height which will lead to rapid tyre wear and instability.

5 WHEEL ALIGNMENT SETTINGS

5.1 INDEPENDENT FRONT SUSPENSION

- Raising independent front suspension often compromises the wheel alignment settings, leading to decreased stability, handling and tyre life.
- The alignment technician should achieve:
 - Caster equal to or exceeding the factory minimum specification, as caster provides steering stability.
 - Camber as close as possible to factory specification, or the suggested alignment settings below.
- During wheel alignment, set toe to zero, pull the front of the vehicle down approx. 10mm from a solid mounting point and observe the effect on toe. If toe decreases, add toe to compensate. If toe increases, reduce toe to compensate. This should give the best tyre wear setting, and account for settlement of the suspension.
- After wheel alignment, drive the vehicle for a short distance. Then drive back onto the wheel alignment machine and recheck final heights and wheel alignment settings.
- It may be found that the factory or suggested alignment settings cannot be achieved. In this case, wheel alignment products such as Fulcrums offset bushings and/or aftermarket control arms should be used to correct the geometry.

Suggested Alignment Settings

- Caster: Minimum +2.0°
 - Increase caster on LHS as appropriate to have vehicle not pull to one side on flat roads.
 - Increased caster improves steering self-centring and driver feedback.
- Camber: 0° to -0.75°
 - Increased negative camber decreases outside edge tyre wear for enthusiastic drivers.
 - Increased negative camber increases cornering grip.
- Toe: 0-3mm toe-in per side
 - Increased negative camber requires more toe-in.
 - The technician will be able to determine the appropriate amount of toe for the camber and bump steer characteristic of the vehicle.

5.2 SOLID AXLE FRONT SUSPENSION

- Raising solid axle front suspension significantly reduces the caster angle, leading to decreased stability and in some instances 'death wobble'.
- It may be found that the factory or suggested caster setting cannot be achieved. In this case, wheel alignment products such as offset bushings and/or aftermarket radius arms should be used to correct the geometry.
- Where the draglink cannot be adjusted enough to correct the steering wheel centre position, aftermarket draglinks should be used. Do not adjust the steering wheel or pitman arm position.

Suggested Alignment Settings

- Caster: +2.0°
- Toe: 0mm

5.3 INDEPENDENT REAR SUSPENSION

- Raising vehicle suspension often compromises the wheel alignment settings, leading to decreased handling and tyre life.
- It may be found that the factory or suggested alignment settings cannot be achieved. In this case, wheel alignment products such as offset bushings and aftermarket control arms should be used to correct the geometry.

Suggested Alignment Settings

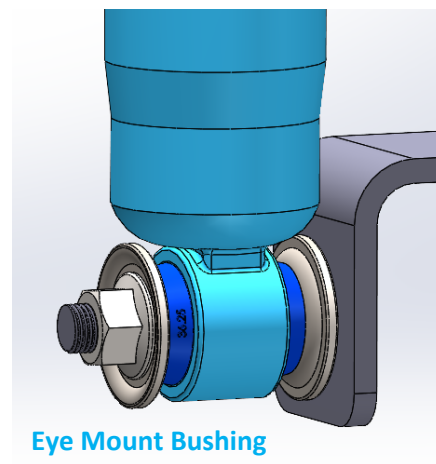
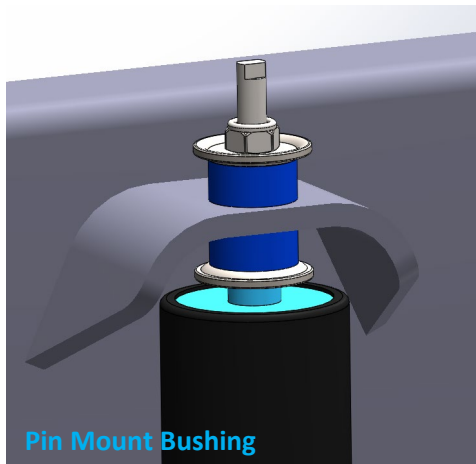
- Camber: 0° to -0.75°
 - Increased negative camber decreases outside edge tyre wear for enthusiastic drivers
 - Increased negative camber increases cornering grip
- Toe: 0-3mm toe-in per side
 - Increased negative camber requires more toe-in

6 SUSPENSION TERMINOLOGY

Term	Definition
Full Bump	Fully compressed suspension position, occurs when the wheel moves fully upward, the bump stop limits any further travel.
Full Droop	Fully extended suspension position, occurs when the vehicle is lifted off the ground and the wheels move fully downward.
Bump Stop	Component that prevents the suspension being over-compressed, this prevents suspension damage or the wheel and tyre contacting the car body. Typically a rubber component mounted to the chassis, control arm or axle, but may be incorporated in the shock absorber.
Droop Stop	Component that prevents the suspension being over-extended, to prevent suspension, CV shaft, brake line damage. Typically built into the shock absorber however some vehicles have a separate rubber component (Most Mitsubishi IFS and some Nissan IFS, among others).
Bump Travel	Wheel travel distance from ride height, to full bump. When a vehicle is lifted, this distance increases.
Droop Travel	Wheel travel distance from ride height, to full droop. This can be measured using the same process in Section 1, but with the whole vehicle raised off the ground. When a vehicle is lifted this distance usually decreases (particularly on independent suspensions). It is important for each wheel to have at least 40mm of droop travel, this will prevent the droop stop from activating during normal driving, which can cause noise and damage over time. Increased droop travel will also provide more traction when off-road, as the wheel maintains better contact with terrain.
Chassis Rake	The angle of the chassis as viewed from the side. Typically measured across the underside of the chassis rail or the sill of the cab. It is desirable to have "positive rake" (front lower than rear). This allows the chassis to be level when towing or carrying load.
Bump Steer	The change in toe setting as a result of wheel travel. This effect is often exaggerated by increased ride height. Bump steer effect causes the steering position to change as the vehicle goes over bumps, the driver may feel this as the steering wheel 'tugging' over bumps.

7 TIPS WHERE POLYURETHANE BUSHES ARE USED

- Polyurethane shock absorber, control arm and sway bar bushings act as a bearing and require lubrication for assembly, operation and longevity. Liberally apply lubricant to the internal surfaces of the bushing during installation. Pin mount bushings (see below) do not require lubrication, as there is no sliding movement across the bushing surface.



- Where shock absorbers are fitted with polyurethane bushings, if possible, reverse the direction of the curved washers as shown above. Polyurethane does not compress like rubber, so this allows the polyurethane to 'flow' more effectively, increasing articulation and service life. SuperPro Polyurethane bushings are fitted to most Formula 4x4 shock absorbers.
- Where Polyurethane is used for control arm bushings, it is not necessary to tension the bushing at ride height. This is due to the bushing acting as a bearing, which allows free rotation.

8 SUSPENSION TYPES

8.1 IFS COIL SPRING FRONT

- Loosen upper and lower control arm to chassis bolts to allow control arms to move freely to remove and install components.
- Mark any adjustment bolts before loosening to ease later wheel alignment.
- **The following bushings must be loosely installed only, then fully tensioned with the vehicle at ride height:**
 - **Upper control arm to chassis**
 - **Lower control arm to chassis**
 - **Strut lower eye to control arm**
- If bushings are tensioned at full droop, the bushing will be under constant torsion at ride height and tear prematurely.

8.2 IFS TORSION BAR FRONT

- The following bushings must be loosely installed only, then fully tensioned with the vehicle at ride height:
 - Upper control arm to chassis
 - Lower control arm to chassis
 - Shock lower eye to control arm
- If bushings are tensioned at full droop, the bushing will be under tension at ride height and tear prematurely.
- Mark any adjustment bolts before loosening to ease later wheel alignment.
- Torsion bar adjustment is required after installation of all kit components:
 1. Determine the desired ride height:
 - Typically 40mm greater than standard ride height or to achieve appropriate chassis rake with the rear springs fitted.
 - A minimum of 40mm of droop travel should be retained.
 2. Lubricate adjustment bolt threads.
 3. Lift the vehicle to remove the load from the bar.
 4. Tighten torsion bar adjustment bolts evenly on each side to increase ride height.
 5. Roll the vehicle back and forth between adjustments to allow the suspension to settle to natural ride height, (unless using turntables under the wheels).
 6. Lower vehicle and measure ride height.
 7. Repeat steps 3 to 6 until the vehicle is at the desired ride height. It may be necessary to adjust one side separately to obtain even ride height between the front wheels.
- If the torsion bar runs out of adjustment before reaching the desired ride height, the torsion bars may need to be reindexed (moved on the spline), or heavy duty torsion bars must be installed.

8.3 SOLID AXLE COIL SPRING FRONT

- Once shock absorbers are installed, always check the spring is trapped (cannot be removed at full droop).
- If any control arms/radius arms are loosened during installation, re-tension at ride height to prevent bushing failure. If bushings are tensioned at full droop, the bushing will be under tension at ride height and tear prematurely.
- After installation, check axle position relative to chassis centreline at ride height. Adjust panhard rod (or fit adjustable rod) if there is excessive offset.
- Check clearance to front driveshaft from crossmembers, sway bars, etc at full droop. Extended linkages or other parts may be required to correct any interference.

8.4 SOLID AXLE LEAF SPRING FRONT

- Trim U-bolts before installation if there is to be more than 15mm excess length.
- ***All leaf spring U-bolts must be torqued ONLY with vehicle sitting with full weight on the leaf springs.***

8.5 SOLID AXLE COIL SPRING REAR

- Once shock absorbers are installed, check the spring is trapped (cannot be removed at full droop)

- If any control arms/radius arms are loosened during installation, re-tension at ride height to prevent bushing failure. If bushings are tensioned at full droop, the bushing will be under tension at ride height and tear prematurely.
- Mark any adjustment bolts before loosening to ease later wheel alignment.
- Check axle position relative to chassis centreline at ride height. Adjust panhard rod (or fit adjustable rod) if there is excessive offset.
- Check for clearance between all suspension components at full droop, particularly sway bars, brake cables and rear axle. Extended linkages or other parts may be required to correct any interference.

8.6 SOLID AXLE LEAF SPRING REAR

- Trim U-bolts before installation if there is to be more than 15mm excess length.
- Fit springs one side at a time.
- ***All leaf spring U-bolts must be torqued ONLY with vehicle sitting with full weight on the leaf springs.***

8.7 IRS COIL SPRING REAR

- If any control arms/radius arms are loosened during installation, re-tension at ride height to prevent bushing failure. If bushings are tensioned at full droop, the bushing will be under tension at ride height and tear prematurely.

8.8 SOLID AXLE FRONT STEERING DAMPER

Where adjustable brackets are used:

1. Measure the closed length of the steering damper.
2. Hold the steering at the full lock position where the damper mounts are shortest apart.
3. Set the damper bracket at the closed length plus 10mm and tighten the bracket.

8.9 COIL OVER SHOCK STRUT ASSEMBLIES

- Never use an impact wrench on the top nut when disassembling struts, the internal nut holding the shock absorber piston to the shaft may loosen which ***can cause the shaft to eject from the shock absorber.***

9 VEHICLE SPECIFIC TIPS

9.1 MITSUBISHI TRITON ML-MR, PAJERO SPORT QE-QF, CHALLENGER PB.

Ensure there is 20mm of clearance between the front upper control arm droop stop and chassis at ride height to prevent control arm failure. Insufficient clearance can be caused by incorrect spring selection, leading to excessive ride height.

9.2 TOYOTA 200 SERIES LANDCRUISER (FITTED WITH KDSS)

Toyota vehicles fitted with KDSS (Kinetic Dynamic Suspension System) have a high-pressure hydraulic system acting between the front and rear sway bars. This high pressure adds lift to the left side of the vehicle, therefore the vehicle requires some compensation to prevent vehicle lean to the right (aka. KDSS Lean). Formula Lift Kits are sold with a coil spacer for the right-hand front spring, while Formula ReadyStrut Lift Kits are supplied with TRC4308 Extended Swaybar Link.

If installing TRC4308, please follow the instructions supplied to rebalance the system.

If installing a coil spacer, the KDSS system requires the installer to:

1. Suspend vehicle on 2-post type chassis hoist allowing wheels to hang.
2. Locate the KDSS valve housing, located on the inside of the left-hand chassis rail, approximately halfway along the rail.
3. Using a 5mm hex key, open the two (2) levelling valves three (3) full rotations anti-clockwise. (Access is from underside of the KDSS valve housing) *Never open more than 3 rotations from closed.*
4. The KDSS system is now open, and the sway bar ends can be freely manipulated, allowing suspension components to be installed.
5. After suspension installation with the vehicle sitting on level ground, close both KDSS levelling valves by turning them clockwise until tight. *It is unsafe to drive vehicle with KDSS system open.*

9.3 TOYOTA 150 SERIES PRADO (FITTED WITH KDSS)

Toyota vehicles fitted with KDSS (Kinetic Dynamic Suspension System) have a high-pressure hydraulic system acting between the front and rear sway bars. This system requires balancing after installing suspension components. Please following the instructions below to rebalance the system.

1. Suspend vehicle on 2-post type chassis hoist allowing wheels to hang.
2. Locate the KDSS valve housing, located on the outside of the left-hand chassis rail, approximately halfway along the rail.
3. Using a spanner, open the two (2) levelling valves 2-2.5 full rotations anti-clockwise. (Access is from underside of the KDSS valve housing). *Never open more than 2.5 rotations from closed.*
4. The KDSS system is now open, and the sway bar ends can be freely manipulated, allowing suspension components to be installed.
5. After suspension installation with the vehicle sitting on level ground, close both KDSS levelling valves by turning them clockwise until tight. Reinstall protective cover / plate. *It is unsafe to drive vehicle with KDSS system open.*

9.4 VOLKSWAGEN AMAROK

The Front Drive Shafts need to be removed to fit the front shock absorbers. VW have designed the driveshaft bolts to be single use only. When replacing the driveshaft bolts, use SuperPro replacement bolt kit TRC3318 then torque to the following settings:

- Outer CV Bolt: 150Nm + 180 Degrees
- Inner CV Bolts: 50Nm + 90 Degrees

10 FORMULA U-BOLT TORQUES

U-bolt threads should be **clean** and **lubricated** using a light oil such as engine/ transmission oil. U-bolts shall be re-tensioned after the vehicle has driven 1000km.

U-bolt	Bolt Diameter x Pitch	<i>N.m</i>	<i>lb.ft</i>
FUB-001	M14X1.5	140	105
FUB-002	M14X1.5	140	105
FUB-003	M12X1.5	85	65
FUB-004	M14X1.5	140	105
FUB-005	M14X1.5	140	105
FUB-006	M14X1.5	140	105
FUB-008	M14X1.5	140	105
FUB-009	M14X1.5	140	105
FUB-010	M14X1.5	140	105
FUB-011	M14X1.5	140	105

11 GENERAL TENSIONING TORQUES

Torque all bolts and nuts to **manufacturers specifications**. The below tensioning torques are to be used as a guide only. The torques below apply to **unlubricated** zinc plated bolts, threaded into steel. Care should be taken if threading into aluminium or other soft materials.

Bolt Diameter x Pitch <i>mm</i>	Grade 4.8		Grade 8.8		Grade 9.8		Grade 10.9		Grade 12.9	
	<i>N.m</i>	<i>lb.ft</i>	<i>N.m</i>	<i>lb.ft</i>	<i>N.m</i>	<i>lb.ft</i>	<i>N.m</i>	<i>lb.ft</i>	<i>N.m</i>	<i>lb.ft</i>
M6X1.0	5	3	9	7	10	8	13	10	16	12
M8X1.25	11	8	22	17	25	19	32	23	38	28
M10X1.25	24	17	47	35	53	39	66	49	79	59
M10X1.5	22	16	45	33	50	37	63	46	75	55
M12X1.25	42	31	85	63	95	70	119	88	143	106
M12X1.75	39	29	78	57	87	64	109	81	131	97
M14X1.5	67	49	134	99	151	111	188	139	226	167
M14X2.0	62	46	124	92	140	103	175	129	209	154
M16X1.5	103	76	206	152	231	171	289	213	347	256
M16X2.0	96	71	193	142	217	160	271	200	325	240
M18X1.5	149	110	299	220	336	248	420	310	504	372
M20X1.5	209	154	417	308	469	346	586	433	704	519
M22X1.5	281	208	563	415	633	467	791	584	950	700
M24X2.0	354	261	709	523	797	588	996	735	1196	882

The below tensioning torques are to be used as a guide only. The torques below apply to **lubricated** zinc plated bolts, threaded into steel. Care should be taken if threading into aluminium or other soft materials.

Bolt Diameter x Pitch <i>mm</i>	Grade 4.8		Grade 8.8		Grade 9.8		Grade 10.9		Grade 12.9	
	<i>N.m</i>	<i>lb.ft</i>	<i>N.m</i>	<i>lb.ft</i>	<i>N.m</i>	<i>lb.ft</i>	<i>N.m</i>	<i>lb.ft</i>	<i>N.m</i>	<i>lb.ft</i>
M6X1.0	3	3	7	5	8	6	10	7	12	9
M8X1.25	8	6	17	12	19	14	24	17	28	21
M10X1.25	18	13	35	26	40	29	50	37	59	44
M10X1.5	17	12	33	25	38	28	47	35	56	42
M12X1.25	32	23	64	47	72	53	89	66	107	79
M12X1.75	29	21	58	43	66	48	82	60	98	72
M14X1.5	50	37	100	74	113	83	141	104	169	125
M14X2.0	47	34	93	69	105	77	131	97	157	116
M16X1.5	77	57	154	114	173	128	217	160	260	192
M16X2.0	72	53	144	106	162	120	203	150	244	180
M18X1.5	112	83	224	165	252	186	315	233	378	279
M20X1.5	156	115	313	231	352	260	440	324	528	389
M22X1.5	211	156	422	311	475	350	594	438	712	525
M24X2.0	266	196	531	392	598	441	747	551	897	661