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## Towing bracket information and maintenance guide

To tow a trailer or caravan safely you must fit a steel frame-work or towing bracket to distribute the towing and pitching loads to the best strong points of the vehicle. Any temporary fastening or improvised bar is not good enough.

1. Towing Brackets are designed to comply with relevant British Standards for 50mm ball coupling, B.S.AU113 and B.S.AU114 for the strength/fatigue requirements (ISO 1103 & 3853). The fixings for the tow ball are two 16mm high tensile bolts at 90mm centres. The ball-centre height is between 350 and 420mm from the ground when the vehicle is fully laden and 65mm from the rear of the vehicle. It is important to ensure that there is a close match in height of the vehicle hitch and the trailer coupling, particularly with close coupled double or triple axle trailers (See Note 2). All measurements should be made with the vehicle and trailer laden. Many Towing Brackets have a reversible hitch-mounting angle to accommodate variations in loads and suspension in the towing vehicle and trailer. If it seems „necessary“ to modify the towing bracket or to use a drop plate or a spacer block please contact us.

Any unauthorised modification to the towing bracket will invalidate the warranty maximum permitted spacer block 12mm between the hitch and the towing bracket in no circumstances may any raiser plate be fitted to the towing bracket.

2. Towing Brackets to tow trailers up to the vehicle manufacturer's maximum recommended trailer weight, for your model, for SINGLE axle trailers. For close coupled double

or triple axle trailers the maximum trailer weight should be reduced by 20%. Towing trailers with gross weights above that recommended at any time will invalidate the warranty and cancel any liability for damage. When fitted and serviced according to our instructions your Towing Bracket will give years of satisfactory service.

3. When fitting a towing bracket it is important to inspect the chassis and body shell for corrosion or damage. All suspect areas must be repaired before fitting and towing. All fixing surfaces should be clean and free from corrosion, dirt, underseal and sound deadening material. It is suggested that during fitting any bare metal surfaces are treated with a zinc rich paint and afterwards coated with underseal or a colour matching the vehicle.
4. All bolts fixing the towing bracket to the vehicle including those on the bumper irons or tie down loops or those in the assembly of the bracket must be regularly checked for correct torque setting. The chassis & body near any towing bracket fixing point must be inspected for any signs of damage or corrosion. Appropriate remedial action must be taken if any faults are found. Inspections must be carried out, by a qualified engineer, at least every 3000 miles towing or every 6 months whichever is the sooner or after any rear end accident to the vehicle or trailer.

Designs with removable sections must be checked for correct bolt torque every time before towing.

BOLT DIAMETER x thread pitch	GRADE	TORQUE	BOLT DIAMETER x thread pitch	GRADE	TORQUE
6mm x 1.00 tpmm std. 1/4" UNF x 28 tpi	8.8	13 Nm / 10 Lbft	12mm x 1.75 tpmm std.	8.8	102 Nm / 76 Lbft
8mm x 1.25 tpmm std. 5/16" UNF x 24 tpi	8.8	29 Nm / 20 Lbft	12mm x 1.50 tpmm med.	8.8	104 Nm / 77 Lbft
	S	49 Nm / 36 Lbft	12mm x 1.25 tpmm fine	8.8	111 Nm / 82 Lbft
10mm x 1.50 tpmm std.	8.8	58 Nm / 43 Lbft	12mm x 1.75 tpmm std.	<b>10.9</b>	143 Nm / 105 Lbft
10mm x 1.25 tpmm fine	8.8	61 Nm / 45 Lbft	1/2" UNF x 20 tpi	S	117 Nm / 86 Lbft
10mm x 1.50 tpmm std.	<b>10.9</b>	82 Nm / 60 Lbft	14mm x 2.00 tpmm std.	8.8	162 Nm / 120 Lbft
	S	77 Nm / 57 Lbft	14mm x 1.50 tpmm fine	8.8	176 Nm / 130 Lbft
7/16" UNF x 20 tpi	S	77 Nm / 57 Lbft	16mm x 2.00 tpmm std. 5/8" UNFx18 tpi	8.8	252 Nm / 172 Lbft
12mm x 1.75 tpmm std.	8.8	102 Nm / 76 Lbft			

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- 5.a) The 50mm ball should be inspected for wear, regularly greased and kept free from dirt & grit.
- b) Pin hitches should be inspected for wear on the pin and the correct operation of all safety catch mechanisms.
- c) Combination hitches (50mm ball with pin hitch) must be inspected every time before use to ensure correct and safe operation of the retaining and safety mechanism. These must be carefully maintained and kept clean with light lubrication.
- d) ALKO and SSK type friction couplings and the tow ball they are coupled to must be kept free from grease, dirt and grit. Check the wear indicator regularly and replace worn pads to maintain performance.

### Towing bracket fitting guide

#### Tools

Fitting a towing bracket can be done by a competent DIY person with small number of basic tools eg. set of spanners up to 24mm AF, 1/2" drive socket set, an electric drill to 12mm capacity, screwdrivers - flat and cross point, pliers. On some vehicles parts of the trim, bumper or brackets are fixed by special fasteners for which the correct tool is needed.

#### Model variations

Every effort is made to describe accurately the models to which the towing bracket fits, however vehicle manufacturers make many changes to model description, special limited editions and other undisclosed modifications, after its initial launch, which may prevent the towing bracket being fitted. Particular care must be taken with chassis cab conversions eg motor homes, trucks, and tippers where a body builder may have modified the chassis by cutting it back, extending it or adding tippers, tail lifts, steps or bumpers.

#### Bumper changes

A common variation to the original specification is the rear bumper with changes to the fixings (particularly the tip bolts/screws) and with the addition of spoilers or skirts. Many of these variations will be fitted by the standard towing bracket some may require cutting the bumper valance or skirt. Take care when removing and refitting the bumper not to mark the body with the bumper tips, use a protective cloth.

#### Exhaust changes

Rear exhaust silencers and tail pipe change frequently either when replaced or with variations at original fitment. When fitting the towing bracket care must be taken to ensure ade-

quate clearance to the exhaust system (which will expand and vibrate). Careful movement of exhaust brackets, bending of the support bars and checking the support rubbers usually overcomes any potential rattle.

#### Number plates

Some vehicles number plates are set below the British Standard, the plate must be moved so that it is not obscured by the towing equipment & illuminated in its new position.

#### Commercial vehicles

Chassis Cabs, Trucks, Tippers, Motor Homes, Caravanettes etc. which have extensions, steps, tail lifts or tipping mechanisms etc. need special care when fitting the towing bracket as there is often a conflict with the British Standard height of the hitch. Offer the bracket into place and check the operation of the mechanism or accessory before fitting and make any necessary adjustments. Do not modify the towing bracket in any way.

#### Drilling holes

Check to see that all is clear on the far side of the hole to be drilled: clear away or protect: carpet, trim panels, looms, fuel tank & pipes, etc. Centre punch and pilot drill to avoid larger drills wandering. In many cases the towing bracket can be used as guide. Take especial care as the drill breaks through as it can be drawn through very quickly and may damage items on the far side. When drilling several holes through one piece fix the first hole before drilling the others. Treat all drilled holes with a zinc rich paint and under-seal after fitting.

#### Fuel tanks

Where tank straps or bolts are removed during fitting ensure that it is propped up on a stable platform.

#### Wiring looms

Make sure that all wires are protected from sharp edges, use grommets and tie straps. Any wiring that is run close to the exhaust must be protected with a heat shield.

#### Spare wheels

In many vehicles the spare wheel has to be removed during fitting, make sure that when you replace it there are no sharp edges, swarf or bolts which may damage the tyre; protect with suitable material.

#### Insulation

Sound insulation which is stuck to the steel at fixing points must be cleared to allow washers and plates to seat properly.

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**Hole alignment**

Because of changes in body pick-up points, production tolerances and movement of fixing holes/tie down loops you must check centre lines as you go.

**Bolts**

When fixing the towing bracket to bumper or other bolted on brackets you must ensure that the bolts fixing them to the vehicle are also tightened to the correct torque.

**Shakeproof washers**

These are supplied with all nuts; for correct operation the nut is held still while the bolt is tightened to the correct torque this allows the washer to bite into the metal and the nut to resist undoing.

**Rusty bolts**

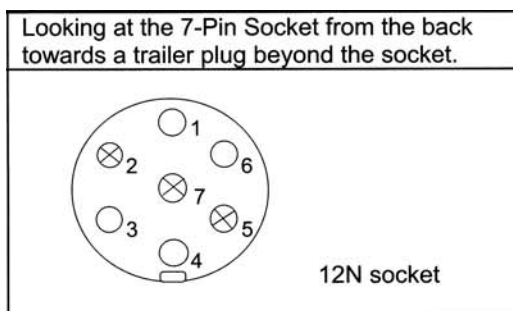
Liberal use of penetrating oil before starting helps, also try tightening first, then heat and/or impact where practicable, can also help.

**Welded nuts/studs**

Clear the threads. The tolerance on the positioning of the manufacturers nuts & studs may be quite large and may mean elongating the holes in the towing bracket.

**Wiring diagram for 12N type 7-PIN Black socket or plug for vehicle road lights**

Colour	Terminal	Purpose
Yellow	1 (L)	LH Indicator
Blue	2 (54G)	Rear Fog Light (or Aux.)
White	3 (31)	Earth
Green	4 (R)	RH Indicator
Brown	5 (58R)	RH side Light
Red	6 (54)	Stop Lights
Black	7 (58L)	LH Side Light



- The driver is always legally responsible for the safety and security of his vehicle, trailer and load. He must stop and take action if not satisfied. Never tow more than the recommended maximum mass for your vehicle. Whatever your load, ensure that it is always tied firmly to the trailer and that any loose goods inside a van, trailer or caravan cannot slip in any direction, ensure that livestock has the minimum room for movement commensurate with their comfort. Use separately fixed baulks and chocks as necessary to help your fastening devices. Check them all en route. Ensure that failure of any one fixing doesn't make others ineffective. Fixings must be strong enough to prevent any movement under emergency braking and cornering. Knots in a rope reduce its strength by half, webbing straps with special buckles are usually better. Empty all water out of boats. Fix boats to the trailer at least at the bow, at a position equivalent to a mast, aft of midships perhaps to the supports for the axle, and at the stern. On car transporters each car wheel should be choked and tied down separately, never rely on just a winch rope or a sheet over any load tied at the corners. A sheet can be torn off by the wind from your speed. Keep the mass as low as you can and over the trailer axle, but ensure that the static downward nose-weight of the trailer on the car's ball is about 40/50kgs. Never place heavy loads at the rear of the trailer.
- Trailers must have reflective triangles, side, number-plate, stop and indicator lights always able to work both day and night, test them each time before moving off. Parked trailers and caravans are prime targets for vandals and thieves. Tyres and wheels are changed for bad ones and wheel-nuts let loose. Tiedowns are cut and loosened. Check before towing.
- Moving off. Check that the jockey-wheel and all legs are fully up. Glose up a telescopic jockey, then lift it right up so that the tyre is not damaged on the road. Check that all lights and brakes are working properly, any parking brake is off, that mirrors give you good rearward vision around and over the load, and that all tyre treads and cold tyre pressures are suitable, (say 35psi for 8" wheel-rims, and for all larger rims about 34psi for 4-ply tyres and 36-46psi for 6-ply tyres). Carry a jack and correct wheel changing tools in your own tool kit. Check wheel nut tightness. Check that the trailer has an approved 50mm coupling or matching pin & ring and that the coupling cup or ring is securely locked on the ball or pin and doesn't rattle, that the ball and towing-bracket are rigidly bolted to the car against vertical and horizontal forces. After a few miles, check all tiedowns and that hubs are running cool and not

losing grease. Road trailers are not normally put into water, but if launching larger boats, get advice before towing on re-greasing hubs and trying out the brakes.

4. Your outfit is now perhaps twice as long and heavy. It takes longer to accelerate and about the same to brake but with more pedal pressure. It may be wider and will cut corners, so take them wider and give ample clearance to cyclists and other traffic. Observe safe spacings both for passing and braking. Pull in to let faster cars pass without being frustrated. Signal early and take everything steadily. Courtesy is contagious. Allow margins for errors. Anticipate the actions of others.

5. Drive smoothly

No sudden stops and swerves which can make a trailer pitch, „snake“ or „jack-knife“. Snaking is more likely downhill, and if large lorries pass at speed, if tyre pressures are too low and if the trailer is „tail-heavy“ or the load slips backwards. In a „Snake“ always slow down carefully at once. Never accelerate because it always gets worse. Jackknifing, when a trailer loses adhesion and its tail swings round towards the car, can only happen when the car is braked with the trailer at an angle. Avoid situations requiring braking when turning a sharp corner. Practise reversing. Braked trailers have manual or automatic „reversing catches“ to prevent the brakes working when you do want to go backwards. Before moving off again, ensure that the catch has cancelled itself. Turn the steering-wheel „left-hand down a bit“ to make the trailer move back to your right, don't overdo it or you will jack-knife. Parking brakes on trailers with automatic reversing brakes have to be applied very firmly to prevent slipping backwards down a hill.

**General information**

For Maximum trailer and Nose weights, see the vehicle manufacturer's specification. Tow-Bar Wt. 8kg  
 BSAU113a 50mm Ball Centre Height is between 350mm and 420mm when the vehicle is laden.  
 Spanners: 17mm, 24mm AF. Drills: 10mm, 16mm.

**Materials**

A	1 off Tie Bar	660mm 40x40x6mm Angle with welded rear rear angle
B	1 off Drop Plate to BSAU 114a	
C	1 off Clamp Plate	130mm 130x6mm Flat drilled 2 off 16mm holes
D	1 off Spacer	130mm 50x25mm Flat drilled 2 off 16mm holes
E	1 off Outer Pad J5/o	130 x 50mm shaped to outer bumper drilled 2 off 16mm holes to BSAU114a
F	1 off Inner Pad J5/l	130 x 50mm shaped to inner bumper drilled 2 off 16mm holes to BSAU114a
G	4 off 10 x 25mm H.T. bolts nuts & shakeproof washers	
H	2 off 16 x150mm H.T. bolts nuts & shakeproof washers	
J	2 off Bushes 38mm x 16mm hole with positioning wire	
K	2 off Washers 40mm x 10mm hole	

**Fitting instructions**

1. Clear the boot floor and remove the spare wheel. Mark the bumper centre line matching the contour & the holes of the Outer Pad E, drill 2 of 16 mm holes symmetrically through the bumper and then on horizontally and parallel through the chassis box section checking the alignment of the holes all the time.
2. Insert Bushes J into the box section using the positioning wires through the access hole in the wheel pan. Fit the tow ball, socket plate and Outer Pad E onto the bolts H, insert Inner pad F, Spacer D and Drop Plate B between the bumper and the box section. Fix the with 2 bolts H using Clamp Plate C inside. Note: For PJ5 on mark 1 cars fit an extra Spacer D.
3. Drill 2 off 10mm holes through the bottom of Drop Plate B into lip of the box section. Fix Tie Bar B to the Drop Plate D with 2 bolts G sandwiching the chassis lip. Drill 2 off 10mm holes up through B into the wheel pan. Fix with 2 bolts G down' through washers K. Tighten all bolts to the correct torque including chassis bolts. Replace the spare wheel, tool kit and boot contents.

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