



88 Parkstreet Village near St. Albans Herts AL2 2LR Tel: 01727-873661 Fax: 01727-875029

## TOWING BRACKET FITTING INSTRUCTIONS

for VOLKSWAGEN Microbus, Transporter, Combi, Van, Caravanette (Split Screen)

Series 2?4 to 2?7 from Aug 53 - Jul 67

### General Information

For Maximum trailer and Nose weights, see the vehicle manufacturer's specification. Tow-Bar Wt. 17kg

BSAU113a 50mm Ball Centre Height is between 350mm and 420mm when the vehicle is laden.

Spanners: 13mm, 16mm, 17mm, 18mm, 19mm, 24mm AF. Drills: 8mm, 10mm, 12mm, 16mm. Fitting Time about 1.5 hrs

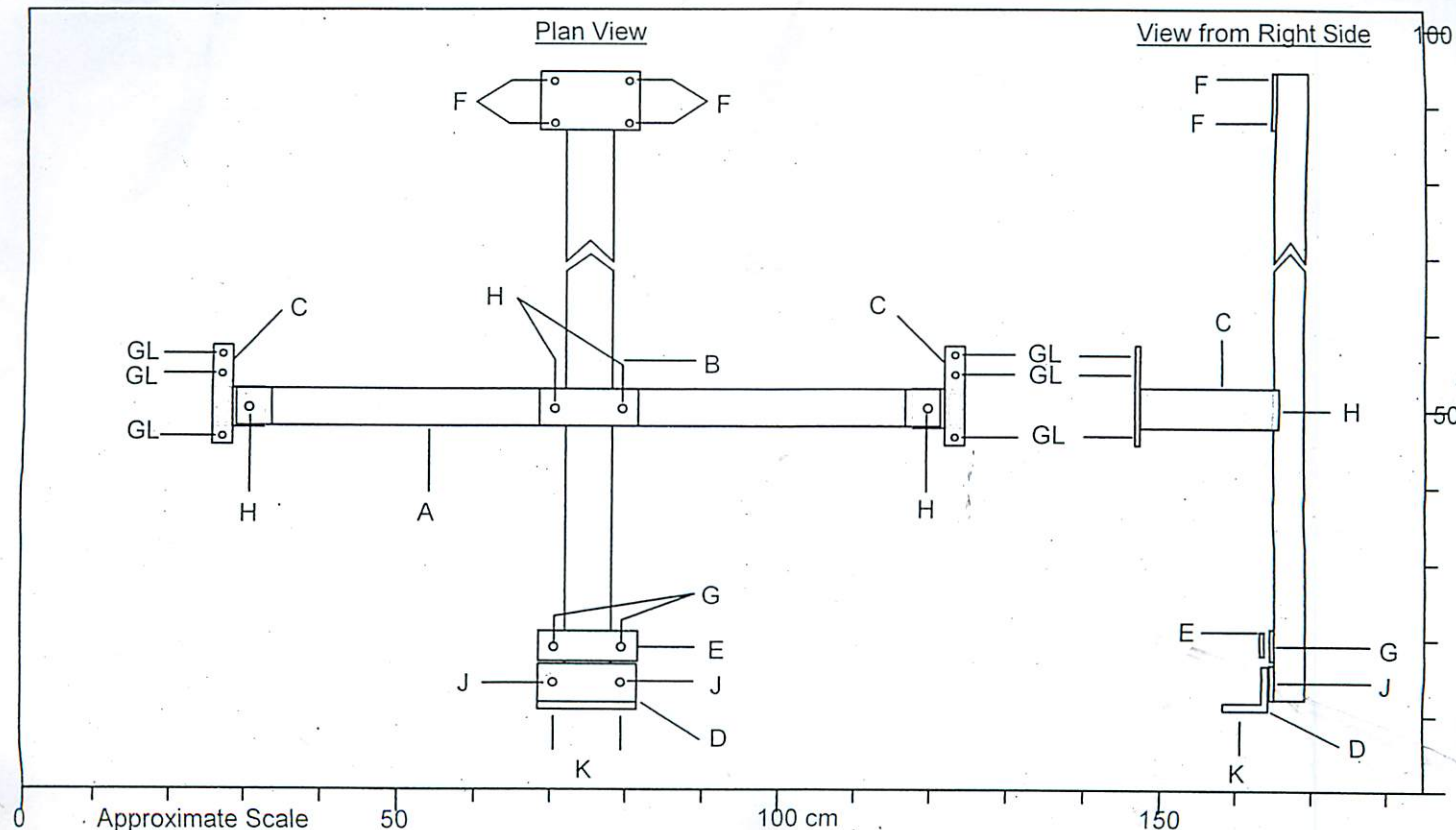
### MATERIALS

|   |                           |                           |                |                                                                 |
|---|---------------------------|---------------------------|----------------|-----------------------------------------------------------------|
| A | 1 off Cross Bar           | 927mm                     | 50x30x4mm      | RHS with 130mm centre plate & end plates                        |
| B | 1 off Tie Bar             | 1029mm                    | 60x40x4mm      | RHS with 3 platforms and 130mm x 100x6mm front plate            |
| C | 1 pr. Drop Arms           | 178mm                     | 50x30x4mm      | RHS with 150x25x6mm top platform & 80x50x6mm lug (Handed L & R) |
| D | 1 off Hitch Mounting      | 130mm                     | 60x60x10mm     | angle drilled to BSAU114a to meet a height within BSAU113a      |
| E | 1 off Clamp Plate         | 130mm                     | 40x6mm         | flat                                                            |
| F | 4 off 8 x 25mm H.T. bolts | nuts & shakeproof washers |                |                                                                 |
| G | 8 off 10 x 25mm "         | "                         | "              | "                                                               |
| H | 4 off 12 x 60mm "         | "                         | "              | "                                                               |
| J | 2 off 1/2" UNF x 1 1/4" " | "                         | "              | "                                                               |
| K | 2 off 16 x 45mm "         | "                         | "              | "                                                               |
| L | 6 off Washers             | 40mm diameter             | with 10mm hole |                                                                 |

U.N.F. thread use the correct nuts

### FITTING INSTRUCTIONS

1. Read the WATLING TOWING BRACKET INFORMATION AND MAINTENANCE SHEET AND THE FITTING GUIDE. Support the bumper and remove the 2 fixing bolts each side. Fix the Drop Arms C to the chassis with 2 bolts G using washers L each side (sandwiching the bumper brackets). Drill 1 off 10mm hole each side through the top plate of C into the chassis and fix with 2 bolts G with washers L.
2. Fix the Cross Bar A to the Drop Arms C with 2 bolts H. Fix the Tie Bar B to A with 2 bolts H. Drill 4 off 8mm hole up through the front plate on B into the lips on the chassis cross member and fix with 4 bolts F. Drill 2 off 10mm hole up through the rear platform on A into the bumper lip and fix with 2 bolts G using Clamp Plate E.
3. Pointing the rear flange of Hitch Mounting D up or down to get the required ball centre height fix D to B with 2 bolts J. Fix your hitch to D with 2 bolts K. **Tighten all bolts to the correct torque including chassis bolts, see the WATLING TOWING BRACKET INFORMATION AND MAINTENANCE GUIDE.**





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## WATLING ENGINEERS LTD

88 PARK STREET VILLAGE, Nr St. ALBANS, HERTS, AL2 2LR



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## **TOWING & TRAILER INFORMATION**

### **KEEP THIS WITH THE VEHICLE HANDBOOK.**

**1. 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 chocked 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.

**2. 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. There are many Regulations which do change frequently, copies can be obtained from HMSO Bookshops. **PARKED TRAILERS & CARAVANS** are prime targets for vandals and thieves. Tyres and wheels are changed for bad ones and wheel-nuts left loose. Tiedowns are cut and loosened. CHECK before towing.

**3. MOVING OFF.** Check that the jockey-wheel and all legs are fully up. Close 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.

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## **TOWING BRACKET FITTING GUIDE**

### **KEEP THIS WITH THE VEHICLE HANDBOOK.**

This GUIDE must be read in conjunction with the **WATLING TOWING BRACKET INFORMATION GUIDE** and the specific towing bracket fitting instructions.

**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, please check with our technical department for confirmation if you are in doubt. 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 adequate 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.** Contact our Technical Department for further help.

**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.

**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.

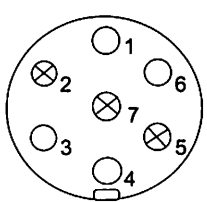
**BOLTS** When fixing the towing bracket to bumper or other bolted on brackets you **MUST** ensure that the bolts fixing them to the vehicle are also tightened to the **CORRECT TORQUE**.

**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                  | Looking at the 7-Pin Socket from the back towards a trailer plug beyond the socket.  |
|--------|----------|--------------------------|--------------------------------------------------------------------------------------|
| 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            |                                                                                      |

12N socket

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## **TOWING BRACKET INFORMATION & MAINTENANCE GUIDE**

**KEEP THIS WITH THE VEHICLE HANDBOOK** as a general guide to ensure continued satisfactory performance of the towing equipment. To tow a trailer or caravan safely you must fit a steel framework 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. Watling 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 Watling 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 our Technical Department for advice.

### **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.** Watling design Towing Brackets to tow trailers up to the vehicle manufacturers 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 & serviced according to our instructions your Watling 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 tpmmm std. 1/4" UNF x 28 tpi  | 8.8   | 13 Nm / 10 Lbft  | 12mm x 1.75 tpmmm std.                 | 8.8   | 102 Nm / 76 Lbft  |
| 8mm x 1.25 tpmmm std. 5/16" UNF x 24 tpi | 8.8   | 29 Nm / 20 Lbft  | 12mm x 1.50 tpmmm med.                 | 8.8   | 104 Nm / 77 Lbft  |
| 3/8" UNF x 24 tpi                        | S     | 49 Nm / 36 Lbft  | 12mm x 1.25 tpmmm fine                 | 8.8   | 111 Nm / 82 Lbft  |
| 10mm x 1.50 tpmmm std.                   | 8.8   | 58 Nm / 43 Lbft  | 12mm x 1.75 tpmmm std.                 | 10.9  | 143 Nm / 105 Lbft |
| 10mm x 1.25 tpmmm fine                   | 8.8   | 61 Nm / 45 Lbft  | 1/2" UNF x 20 tpi                      | S     | 117 Nm / 86 Lbft  |
| 10mm x 1.50 tpmmm std.                   | 10.9  | 82 Nm / 60 Lbft  | 14mm x 2.00 tpmmm std.                 | 8.8   | 162 Nm / 120 Lbft |
| 7/16" UNF x 20 tpi                       | S     | 77 Nm / 57 Lbft  | 14mm x 1.50 tpmmm fine                 | 8.8   | 176 Nm / 130 Lbft |
| 12mm x 1.75 tpmmm std.                   | 8.8   | 102 Nm / 76 Lbft | 16mm x 2.00 tpmmm std. 5/8" UNFx18 tpi | 8.8   | 252 Nm / 172 Lbft |

**5.a)** The 50mm ball should be inspected for wear, regularly greased (NOT ALKO & SSK) 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.