



DUNLOP

AGO/40 Optical Alignment Gauge

OPERATING INSTRUCTIONS

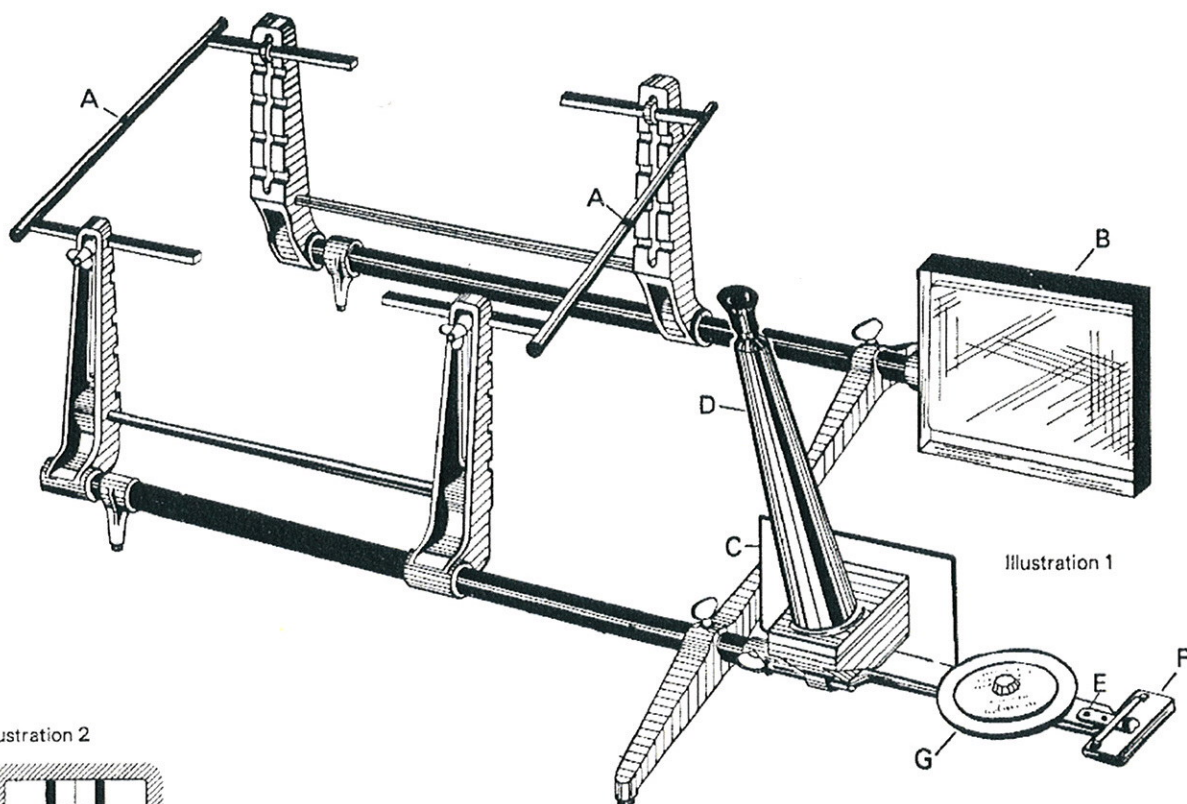
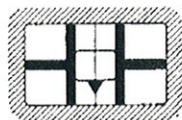


Illustration 2



To Assemble Gauge

Assemble gauge as shown in Illustration 1 with the periscope (D) fixed on the left hand unit and the mirror (B) on the right hand unit.

The contact bars may be fitted at any of five different height positions to suit the radius of the tyre and wheel assembly being checked. The height of all the bars must be the same and should be selected to bring the bars as near hub centre height as possible.

Each bar may be fitted into the support arms in either of two directions providing a range in width sufficient to cover all tyres on 8" to 24" diameter rims. The contact bars may be both inboard of the support arms, both outboard of the support arms, or one inboard and one outboard according to need.

To Check Accuracy of Gauge

1. Stand the complete gauge on a level, clean floor with contact bars touching as shown in (A) Illustration 1.
2. Adjust mirror and periscope until the reflection of target plate (C) is visible through periscope.
3. Sighting through periscope move pointer (E) until the image reflects the hair-line in the centre of the triangle between the vertical lines as in Illustration 2.

The pointer should now be at zero on graduated scale (F). If not, slacken the two wing nuts holding the scale; adjust the scale to zero and retighten wing nuts. The gauge is now ready for use.

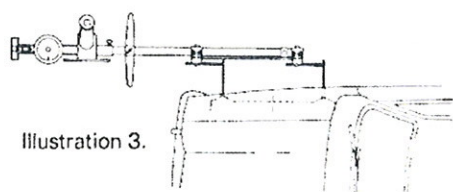


Illustration 3.

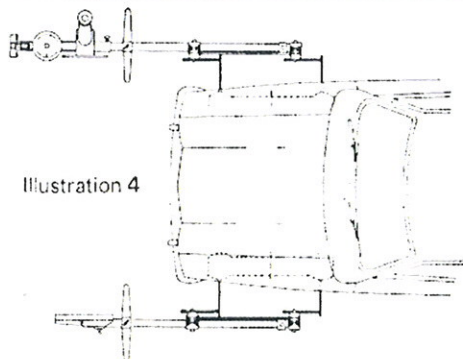


Illustration 4

To Operate the Gauge

Before using the gauge, reference should be made to the vehicle manufacturer's instructions relating to loading etc.

a. Cars and Vans

The vehicle should be driven FORWARD onto a flat level surface and brought gently to rest with the front wheels pointing straight ahead. DO NOT REVERSE INTO POSITION.

1. Place contact bars of periscope unit touching the offside front tyre as near the centre of the sidewall as possible and avoiding any lettering or ribs as in Illustration 3.
2. Remove periscope unit from tyre and place against mirror unit as shown in Illustration 1, adjusting contact bars of mirror unit to the same height and distance apart as those of the periscope unit. TAKE THIS OPPORTUNITY TO CHECK ACCURACY OF GAUGE AND ADJUST IF NECESSARY.
3. Set up both units as in Illustration 4. Looking through periscope adjust pointer until hair-line bisects the triangle between the two vertical lines (Illustration 2). The amount of 'toe-in' or 'toe-out' can now be read from scale (F) Illustration 1 in degrees and minutes.
4. To allow for any possible lateral run out of wheels and tyres, the vehicles should be moved FORWARD until the wheels

have rotated HALF A REVOLUTION (180°) and the operation repeated. If a different reading is obtained the two results should be averaged.

Any change required should be made strictly in accordance with the vehicle maker's recommendations.

The Dunlop Optical Alignment Gauge measures the angle between pairs of wheels on a vehicle. The scale (F) gives 'toe-in' or 'toe-out' as an angle in degrees and minutes, each division on the scale representing 10 minutes. A calculator (G) is provided to convert the angle obtained to millimetres or fractions of an inch (linear 'toe-in' or 'toe-out').

Set the arrow on the top dial to the distance apart (or specified width) of the measuring positions as used by the vehicle manufacturer to determine the amount of 'toe-in' or 'toe-out' and detailed in the appropriate workshop manual or handbook. Now read the linear 'toe-in' or 'toe-out' against the average of the angular reading obtained.

NOTE: THE SPECIFIED WIDTH MAY BE EITHER THE NOMINAL WHEEL DIAMETER OR A DIMENSION EQUIVALENT TO A DIAMETER ON THE TYRE SIDEWALL E.G. MID-SIDEWALL.

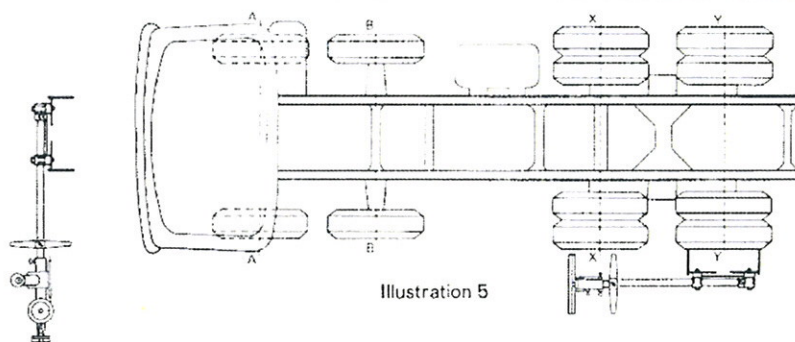


Illustration 5

b. Commercial Vehicles

The Dunlop AGO/40 Gauge is designed to deal with Commercial Vehicles alignment problems on two, three or four axle vehicles.

It is recommended that the vehicle manufacturer's recommendations in respect of loading etc. are complied with prior to using the gauge. In the absence of definite instructions from the manufacturer, it is usual to check commercial vehicles in a fully laden condition and to set all wheels parallel.

Any interference with the vehicle manufacturer's setting of the drop arms or the interconnecting links could result in serious tyre, wheel and steering problems. Under no circumstances should adjustment be made to drop arms or interconnecting links when setting front end alignment.

Single Steering Axle

Proceed exactly as for checking cars.

Twin Steering Axles

Checking wheel alignment on twin steered vehicles presents special problems which can be quickly overcome using the Dunlop AGO/42 optional equipment consisting of a larger size mirror and a target plate enlargement frame.

1. Check the alignment of the pairs of wheels in front axles (A) and (B) Illustration 5 as for checking cars. Adjust if necessary to the manufacturer's recommendations or set to parallel.
2. Remove mirror bracket 'B' (Illustration 1) and replace with AGO/42. Fit target plate enlargement frame over target plate. Place mirror unit against axle 'Y' (Illustration 5) with mirror facing to the front of vehicle.

3. Place periscope unit on level floor approximately 1 metre in front of the front bumper with the periscope facing the mirror (Illustration 5).

With pointer at zero move the periscope unit until the hair-line bisects the triangle as in Illustration 2. ENSURE THE UNIT IS NOT DISTURBED.

4. Move mirror unit to axle (X) and check reading. This should be the same as that for axle (Y). If not, the rear axles are not parallel and should be adjusted as necessary.

5. Position mirror unit at axle (A) and check reading. If the original setting was parallel, the hair-line should be central. For an original setting of 'toe-in' the pointer must be moved to register half the amount of the 'toe-in' eg. $\frac{1}{2}$ " movement for a $\frac{1}{2}$ " 'toe-in' to bring the hair-line to the central position.

If the hair-line is not central, gently turn the steering wheel, keeping the contact bars positioned on the rim or tyre sidewall until the hair-line bisects the triangle. Axle (A) is now correctly aligned with the rear axles.

6. Move the mirror unit to axle (B) and check the reading. Note this reading and to compensate for local run-out in tyres and/or wheels roll the vehicle FORWARD half a revolution (180°). Repeat items 2-6. Should the results vary these should be averaged and the connecting rod(s) adjusted if necessary until the hair-line is central.

7. Should the inter-axle adjuster require adjustment, a recheck from item 2 onwards should be made.



AGO/40/1 OPTICAL ALIGNMENT GAUGE
SPARE PARTS LIST

Part No.	Quantity Per Gauge	Description
DA1	1	Mirror Bracket
DA2	4	Mirror Corner Clamp
DA3	1	Bottom Dial
DA4	1	Top Dial
DA5	2	Balance Leg
DA6	2	Single Leg
DA7	1	Quadrant Arm
DA8	1	View Box Cover
DA9	1	View Box Tube Top
DA10	1	View Box
DA11	1	Knob
DA12	1	Target Plate
DA13	1	Guide Strip c/w Wing Nuts
DA14	1	Pointer c/w Weld Screw
DA15	6	Foot
DA16	1	View Box Window
DA17	4	Arm
DA18	4	Contact Bar
DA19	4	Eye Bolt
DA20	4	Wing Nut
DA21	1	Scale Plate
DA22	1	Large Mirror
DA23	1	View Box Mirror c/w P.S. Tape
DA24	1	Lens
DA25	1	Eye Piece
DA26	2	Tie Bar
DA27	2	Bar Peg
DA28	2	Main Bar
DA29	1	M4 x 25 Long Round Head Screws
DA30	1	Truarc Rintorced Self-locking Ring External No. 5115-18
DA81	2	M4 Std Nut
DA82	2	M4 Shakeproof Washer
DA32	1	Self-lok Spring Pin 1/4" dia. x 1" long
DA33	5	Thumb Screw Plain Pattern M8 x 25 Lg
DA34	4	M8 x 10 W Point Hex Socket Set Screw
DA35	6	M8 x 16 W Point Hex Socket Set Screw
DA36	2	M4 x 10 Long C'sunk Head Socket Screw
DA37	4	M5 x 7 Long Round Head Screw
DA38	2	M4 Std. Hex Nut Self Locking
DA39	2	Ø4 Double Coil Flat Spring Washer
DA40	4	Ø8 Std. Washer
DA41	4	M3 x 15 Long RSD/C'sunk Head Screw
DA42	2	M3 x 8 Long C'sunk Head Screw
DA43	6	M3 x 10 Long Cheese Head Screw
DA44	4	M3 Std. Lock Nut
DA45	8	Ø3 Std. Washer
DA46	2	M3 Std. Wing Nut
DA47	2	Ø3 x 20 Long Dowel
DA48	2	Ø3 x 15 Long Dowel

SUB-ASSEMBLIES

DA49	1	Mirror Bracket Assembly Complete
DA50	1	View Box Assembly Complete
DA51	1	Calculator Assembly Complete

