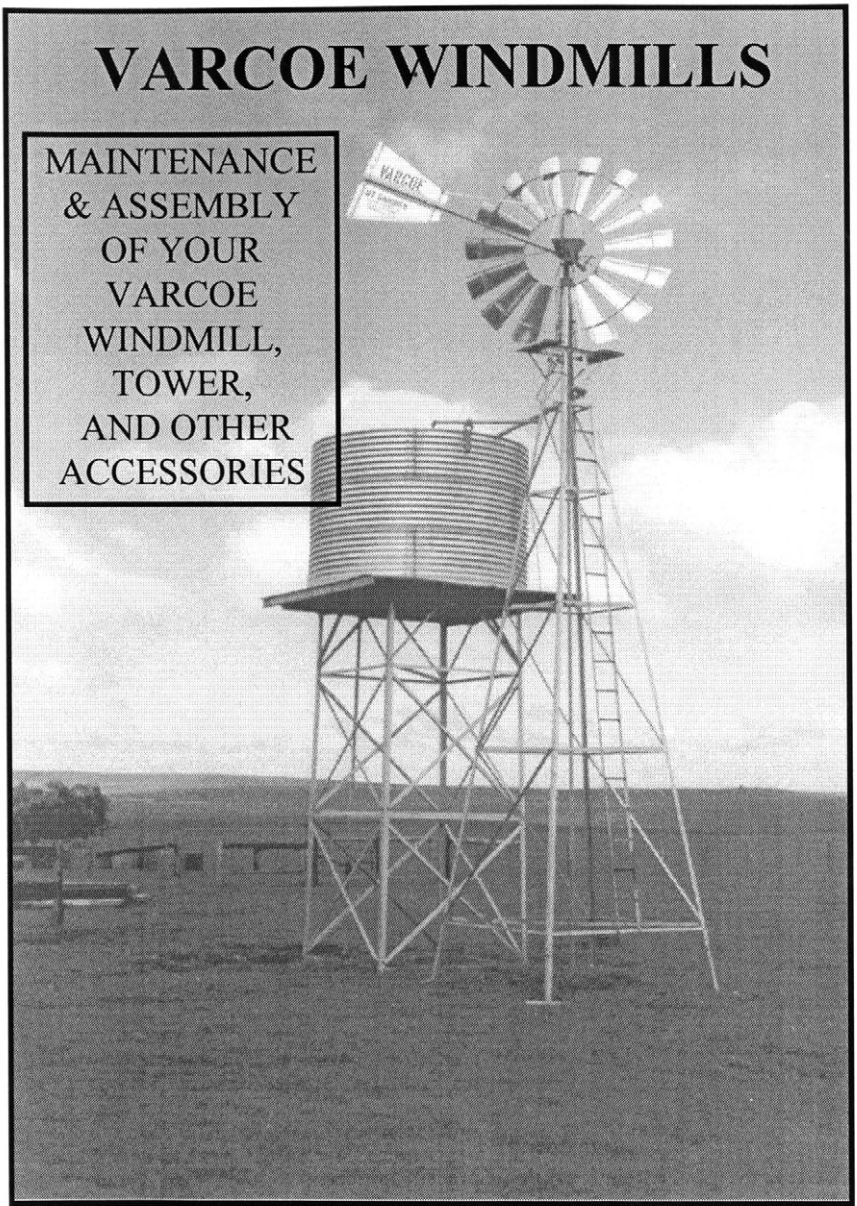
VARCOE WINDMILLS

MAINTENANCE
& ASSEMBLY
OF YOUR
VARCOE
WINDMILL,
TOWER,
AND OTHER
ACCESSORIES



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VARCOE ANGLE IRON TOWER ASSEMBLY

(Instructions based on a 15ft tower)

For assistance in identifying components, the letters in brackets refer to the components list opposite.

- When assembling towers, it is essential to have it laid out on trestles or a stand. It is helpful to have an assistant to support the upper legs until the tower is loosely assembled.
- All legs are punched the same.
- Nuts go to the outside on the entire tower.

DO NOT TIGHTEN ANY BOLTS UNTIL THE TOWER IS COMPLETELY ASSEMBLED.

Instructions:

1 Fit the top tower casting (b) to the four legs (a) with the grease nipple **down**. This has 8 bolts all round with nuts on outside - these are your 40mm bolts with the extra nut (for use as a locknut) which goes on last when the tower is complete. (Fig 1)

2 Fit the lower tower casting (c) also with the grease nipple **down** and peg on top pointing to base of the tower. This has two 30mm bolts in upper legs and two 30mm bolts in lower legs.

3 Fit the two platform supports (i, j) to the **outside** of legs. The one having two lugs (i) goes on the upper side with lugs pointing to base of tower. The bolts for here and onwards are 20mm.

4 Bolt the two top steps (k) to the **outside** of the upper and lower sets of legs (there will be holes on the sides which don't get used).

5 There are three sets of four horizontal stays (l,m,n) - one has two holes approx. 300mm apart. This one goes on the lower side and on the **inside** of the legs. Fit the remaining horizontal stays in the same manner, one set at a time.

6 There are two sets of three diagonals (o,p). Fit these on **outside** of tower over horizontal stay bolts as shown in diagram (Fig 2).

7 Fit the bore supports (u,v) diagonally between the legs, starting at the bottom of the tower. The shortest one goes across the middle of the top horizontals and is fitted with J Bolts.

8 Turn tower over once to make fitting of ladder possible. The ladder side rails (q) are marked **top** and steps (r) fit **inside**.

9 Starting from the top casting, **tighten all bolts** working down to the bottom of the tower. Fit pullout plate and arms (e) over the top casting, and fit bow (f,g) to platform lugs with chain link facing base of tower and connect to pullout arms. Fit platform boards (h) using Coach bolts.

10 Cement in anchor down legs (s), each hole needs to be 300 x 600 deep. Dome top of concrete so water cannot pond around top of legs.

11 Attach the manual pullout lever (t) to tower leg under bow piece at base of tower after the tower is erected.

RECOGNITION OF *VARCOE TOWER COMPONENTS* · 15 & 20 ft Tower (Complete with castings, pullout)

	Ref Part	No.	Description
(a)	Tower Legs (15ft only)	4	40 x 40 x 3 Galv Angle · each 4420mm
(b)	Top Tower Casting & Bearing	1	GDJ118 and 1 of GDJ116a (See pictures)
(c)	Lower Casting	1	GDJ117 (supplied with head conversion)
(d)	Rod Connector & Wooden Block	1	GDJ114 (supplied with head conversion)
(e)	Pullout Plate & Arms with split pins	1	GDJ272 (supplied with head conversion)
(f)	Bow Piece	1	GDJ273 (supplied with head conversion)
(g)	Bow Pin & Split Pins	1	GDJ285 (supplied with head conversion)
(h)	Platform Boards & Bolts	4	Hardwood Boards
(i)	Platform Support & Lugs	1	40 x 40 x 5 Galv Angle with 40 x 8 Lugs
(j)	Platform Support plain	1	40 x 40 x 5 Galv Angle · 813mm
(k)	Top Step	2	30 x 30 x 3 Galv Angle · 317mm
(l)	No 1 Horizontal	4	30 x 30 x 3 Galv Angle · 394mm
(m)	No 2 Horizontals	4	30 x 30 x 3 Galv Angle · 724mm
(n)	No 3 Horizontals	4	30 x 30 x 3 Galv Angle · 1137mm
(o)	No 1 Diagonals	3	30 x 30 x 3 Galv Angle · 1403mm
(p)	No 2 Diagonals	3	30 x 30 x 3 Galv Angle · 1689mm
(q)	Ladder Supports	2	30 x 30 x 3 Galv Angle · each 2674mm
(r)	Ladder Steps	6	30 x 30 x 3 Galv Angle · each 305mm
(s)	Anchor Legs	4	40 x 40 x 3 Galv Angle · each 600mm
(t)	Manual Pullout Lever	1	TGDJ292
(u)	Top Bore Support Plus a U Bolt & 2 J Bolts	1	40 x 50 x 5 Galv Angle · 455 mm (20ft twr 750mm), U & J Bolts
(v)	Lower Bore Support & U Bolt (used as middle support for 20ft twr)	1	40 x 40 x 5 Galv Angle · 1550mm, U Bolt
(w)	Box of Bolts	1 8 of	8 of 10 x 40, 4 of 10 x 30, 50 of 10 x 20, 45x10 coach bolts
	Extras for 20 ft Tower only		
(x)	No 3 Diagonals (20 ft Tower only)	3	30 x 30 x 3 Galv Angle · 2032mm each
(y)	No 4 Horizontals (20ft Tower only)	4	40 x 40 x 3 Galv Angle · 1581mm each
(z)	Lower Bore Support plus U Bolt	1	40 x 40 x 5 Galv Angle · 2159mm plus U
(aa)	Ladder Side (replacing listed for 15ft Twr)	2	30 x 30 x 3 Galv Angle · 4191mm each
(ab)	Tower Leg (replacing those listed for 15ft Tower)	4	40 x 40 x 3 Galv Angle · 6000mm each
(ac)	Extra Bolts	18	10 x 20
(ad)	Extra Steps	3	30 x 30 x 3 Galv Angle · each 305mm
	U Bolt	1	

Fig. 1

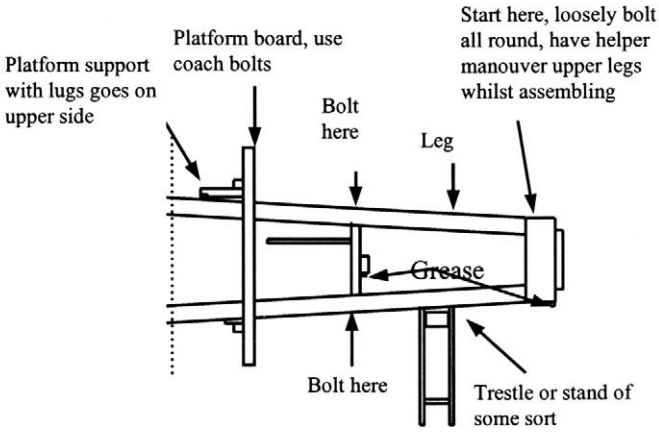
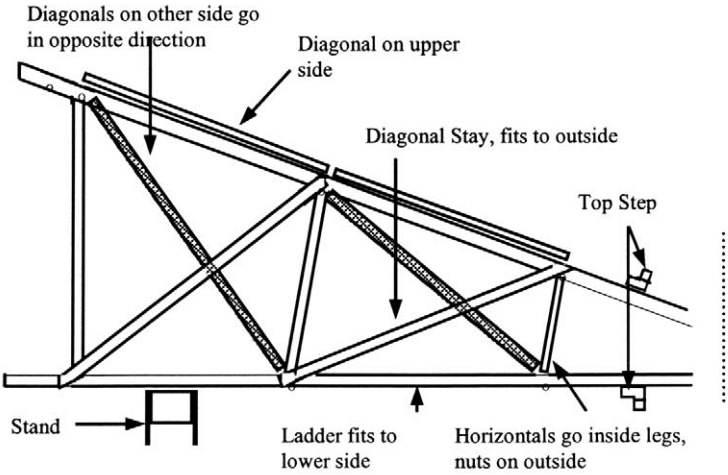

Platform support with lugs goes on upper side
Platform board, use coach bolts
Bolt here
Leg
Start here, loosely bolt all round, have helper manouver upper legs whilst assembling
Grease
Bolt here
Trestle or stand of some sort

Fig. 2


Diagonals on other side go in opposite direction
Diagonal on upper side
Diagonal Stay, fits to outside
Top Step
Stand
Ladder fits to lower side
Horizontals go inside legs, nuts on outside

ERECTING VARCOE MILL HEAD ON A VARCOE TOWER

1 If not already installed, place top tower bearing on the top casting after filling with grease. Lower the pullout plate and arms over top casting at right angles to the guide rod on the lower casting.

2 Lower head into castings. Ensure that the lug on the tower bearing fits into the recess on the body pipe sleeve. Remove the small bolt from the tail standard and fit into the hole provided in the body pipe below the lower tower casting. On all Direct Action mills this bolt is fitted in the bottom of the pipe stem and must be removed before attempting to lower the head into the castings.

3 Fit the bow piece to the two arms on the pullout plate with the links for the pullout wire pointing down. Fit the bow piece to the lugs hanging from the platform support with galv pin supplied.

4 Fit the tail to the mill head. Allow the tail to hang down onto the platform and insert the pin through the horseshoe and the pullout collar bush (grease the pin before fitting). Secure the two split pins. Release the bolt and bush on the tail standard or the large split pin and washer on all direct action mills. Lift the tail and in the case of geared mills, place the bolt and bush through the U on the end of the tail stay and bolt to the tail stay bracket. On the direct action mills simply slip the eye on the end of the tail stay over the post, replace the large washer and split pin. On the geared mills, the tail stay standard has three holes. Usually the hole nearest the mill shaft is for a 6 ft wheel, the middle hole for a 7 ft and the outer hole for an 8 ft wheel. If it is found that the mill does not govern out of the wind soon enough, this can be adjusted by moving the tail stay one hole nearer the shaft, resulting in the tail not lifting as high and therefore making the mill easier to pull out of gear. No provision is made for adjustments on the direct action mills.

5 If a wind is blowing it is now advised to turn the mill off before fitting the wheel. (Pull down on the bow piece and tie it to the tower). This will ensure that the wheel will be side on to the wind when fitting. Remove the five 12mm bolts from the shaft flange, sit the wheel on the boss provided and fit the bolts with the spring washers and nuts on the inside. To facilitate assembly the boss is a loose fit in the wheel. It will be found that the bolts are easily inserted in the hole if the wheel is turned so as the hole is on the side.

6 Tighten all bolts and fill the gearbox with oil (S.A.E. 90 gear oil. Not supplied). About 1 inch of oil over the pitman spigots is sufficient. Approximately 2 litres. (This does not apply to the Junior model).

7 Fit the rod connector and wooden block on the swivel rod, wooden block uppermost. Ensure that the set screw is locked on the square cut on the swivel rod. Connect the pump rod and the mill is now ready for work.

ERECTING VARCOE MILL HEAD ON A FOREIGN TOWER

1 Fit the top tower casting over angles with 10 x 40 bolts. Lock nuts must be fitted to the bolts on the top casting.

2 Fit lower tower casting inside tower with the guide rod pointing down and towards the tank, or the position you require the pullout wire. Measure 445mm (17 ½ inches) from the top of the angles, (or the under side of the top casting) to the bottom side of lower casting. Check to see that the casting is straight in the tower, mark holes and drill tower legs (10mm clearance holes). Bolt casting into tower using approximately 8 x 40 bolts.

3 Place top tower bearing on the top casting after filling with grease. Lower the pullout plate and arms over top casting at right angles to the guide rod on the lower casting.

4 Lower head into castings. Ensure that the lug on the tower bearing fits into the recess on the body pipe sleeve. Remove the small bolt from the tail standard and fit into the hole provided in the body pipe below the lower tower casting. On all Direct Action mills this bolt is fitted in the bottom of the pipe stem and must be removed before attempting to lower the head into the castings.

5 Fit the bow piece to the two arms on the pullout plate with the links for the pullout wire pointing down. Fit the bow piece bracket inside the bow piece. Slide the bracket up the tower legs so as the movement in the bow piece is equal either side of the horizontal when the pullout mechanism is operated. Mark the holes on the tower legs, drill, and secure with two 20 x 10 bolts.

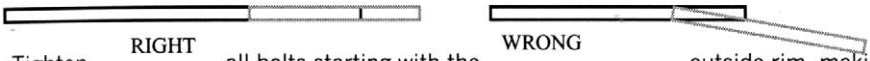
6 Fit the tail to the mill head. Allow the tail to hang down onto the platform and insert the pin through the horseshoe and the pullout collar bush (grease the pin before fitting). Secure the two split pins. Release the bolt and bush on the tail standard or the large split pin and washer on all direct action mills. Lift the tail and in the case of geared mills, place the bolt and bush through the U on the end of the tail stay and bolt to the tail stay bracket. On the direct action mills simply slip the eye on the end of the tail stay over the post, replace the large washer and split pin. On the geared mills, the tail stay standard has three holes. Usually the hole nearest the mill shaft is for a 6 ft wheel, the middle hole for a 7 ft and the outer hole for an 8 ft wheel. If it is found that the mill does not govern out of the wind soon enough, this can be adjusted by moving the tail stay one hole nearer the shaft, resulting in the tail not lifting as high and therefore making the mill easier to pull ou of gear. No provision is made for adjustments on the direct action mills.

7 If a wind is blowing it is now advised to turn the mill off before fitting the wheel. (Pull down on the bow piece and tie it to the tower). This will ensure that the wheel will be side on to the wind

ASSEMBLING 10FT VARCOE WHEEL

Bolt the six spokes onto the hub with the hole in the short cross stay of the spokes downwards (or towards the head of the mill) and when the grub screw in the hub is also in the lower position. DO NOT TIGHTEN ANY BOLTS.

Proceed to fit the six fan blade sections starting with the outer hole on the outer hoop (marked with paint) in the hole in the end of the spoke. The inner hole in the other end will now match up with the hole in the end of the next spoke. It is important that the ends of each segment are staggered on the spoke, · that is one end under, the other over (see drawing).

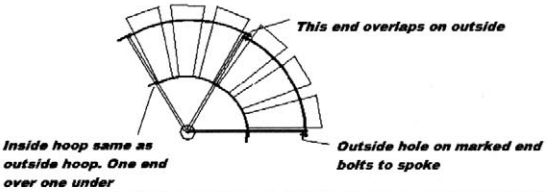


Tighten all bolts starting with the outside rim, making sure that the two rims are parallel where they cross.

Tighten inner ring bolts keeping as straight as possible. Leave hub bolts until last.
Bolts supplied are · 1 of 1/2 x 19mm Set screw (To bolt hub onto shaft)
2 of 10 x 40mm Galv. bolts and nuts (To bolt hub onto shaft)
39 of 10 x 30mm Stainless Steel Set Screw with Stainless Steel nyloc nut (To bolt wheel rims together and spokes onto hub)

ERECTING 10FT MILL ON FOREIGN TOWER

A long Pullout Plate and Arms must be used, and the Platform Supports moved down so as the bolt holes are 4ft or 1.220 mt from the underneath of the top casting. If the tower is not a Varcoe, the Platform Support will not have lugs for the Bow Piece. Fit the Bow Piece Bracket supplied below the platform · lugs down. It is recommended that the Platform Support when removed be replaced with the angle supplied on all sides of the Tower.



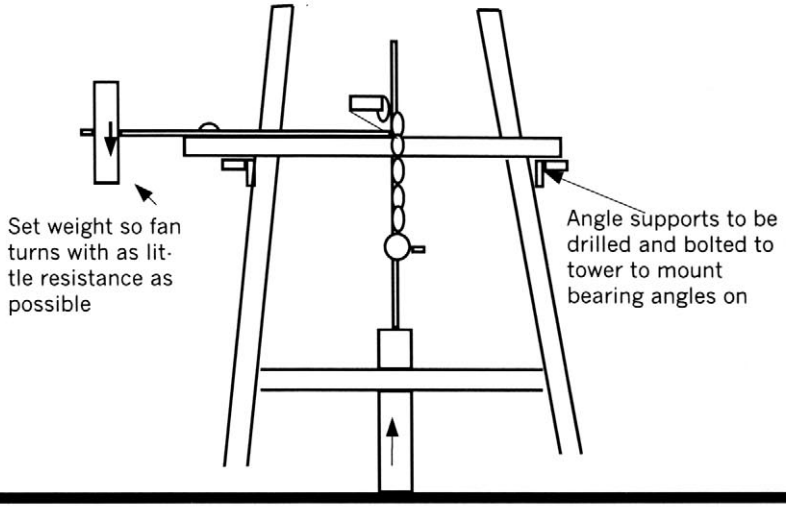
MAINTENANCE OF YOUR VARCOE WINDMILL

Varcoe windmills will require very little regular maintenance and this can be carried out with the minimum of equipment · e.g. hammer, pipe wrench, shifting spanner. Oil level should be checked at six monthly intervals, but this will be found to very seldom need adjustment. Top up or refill with SAE90 Gear Oil. The mill should be greased at the same time, or more often in coastal areas.

Geared and Direct models have Grease Nipples located as follows:
One just beneath the main housing (on tail sleeve) and one on each of the top and bottom Tower Castings.
Junior mill, grease points are:
Under the yellow mill cap, you will find a plastic crank bearing and two sealed shaft bearings. These should be greased.
The rocker bearing is greased through a hole in the back of the main body of the mill.

Counter Balance Assembly

Basic instructions for fitting Counter Balance
(mill shown in middle of stroke)



VARCOE WINDMILLS

A great Australian for over 90 years!

Warranty

(Retain your Invoice as proof of purchase)

THE COMPANY (Dean & McCabe Windmills) AGREES with the original purchaser of each VARCOE WINDMILL that, at any time within three years from the date of despatch of such windmill, providing the tower anchorages hold, and the mill and tower are erected and maintained in accordance with the instructions, the following warranty will apply:

Parts which, on return, prove to the satisfaction of the Company to be defective in material or workmanship, will be repaired or replaced to the original point of despatch by the Company without charge . All freight costs are borne by the purchaser.

Under no conditions will the Company accept responsibility or make any allowances for any consequential damages or any other expenses whatsoever.
Invoice Number and/or Serial Number of Windmill is required for all Warranty claims.