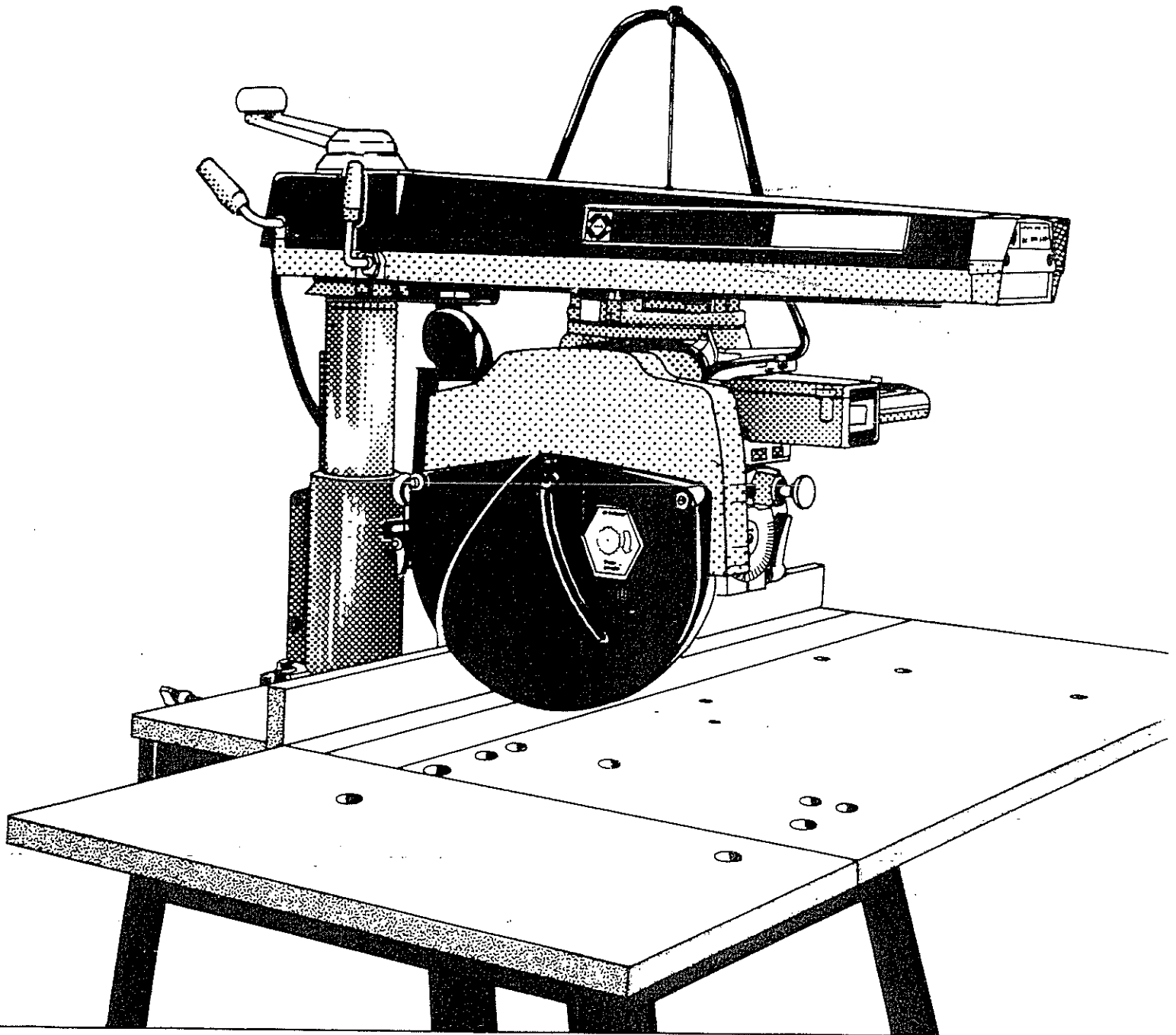
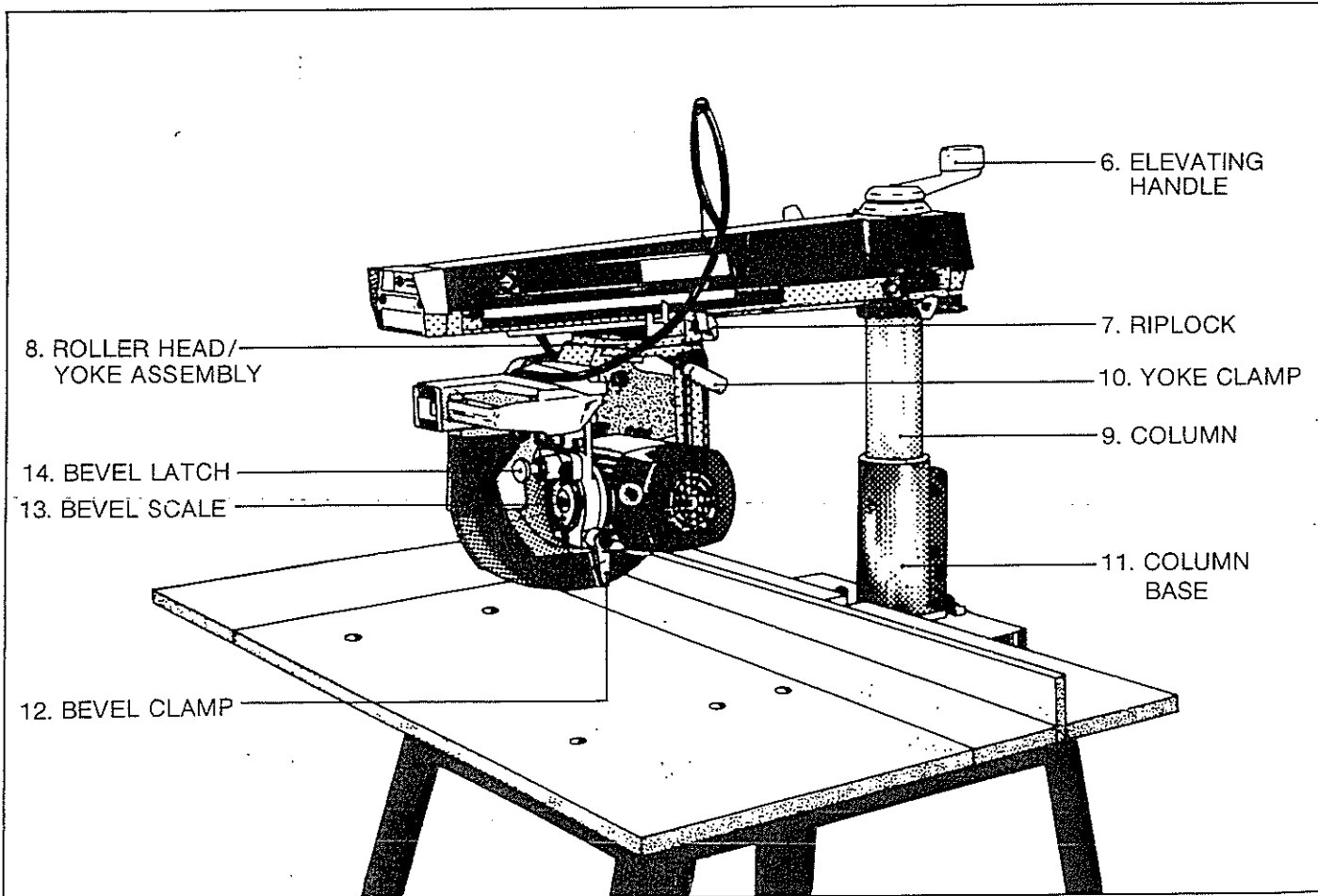
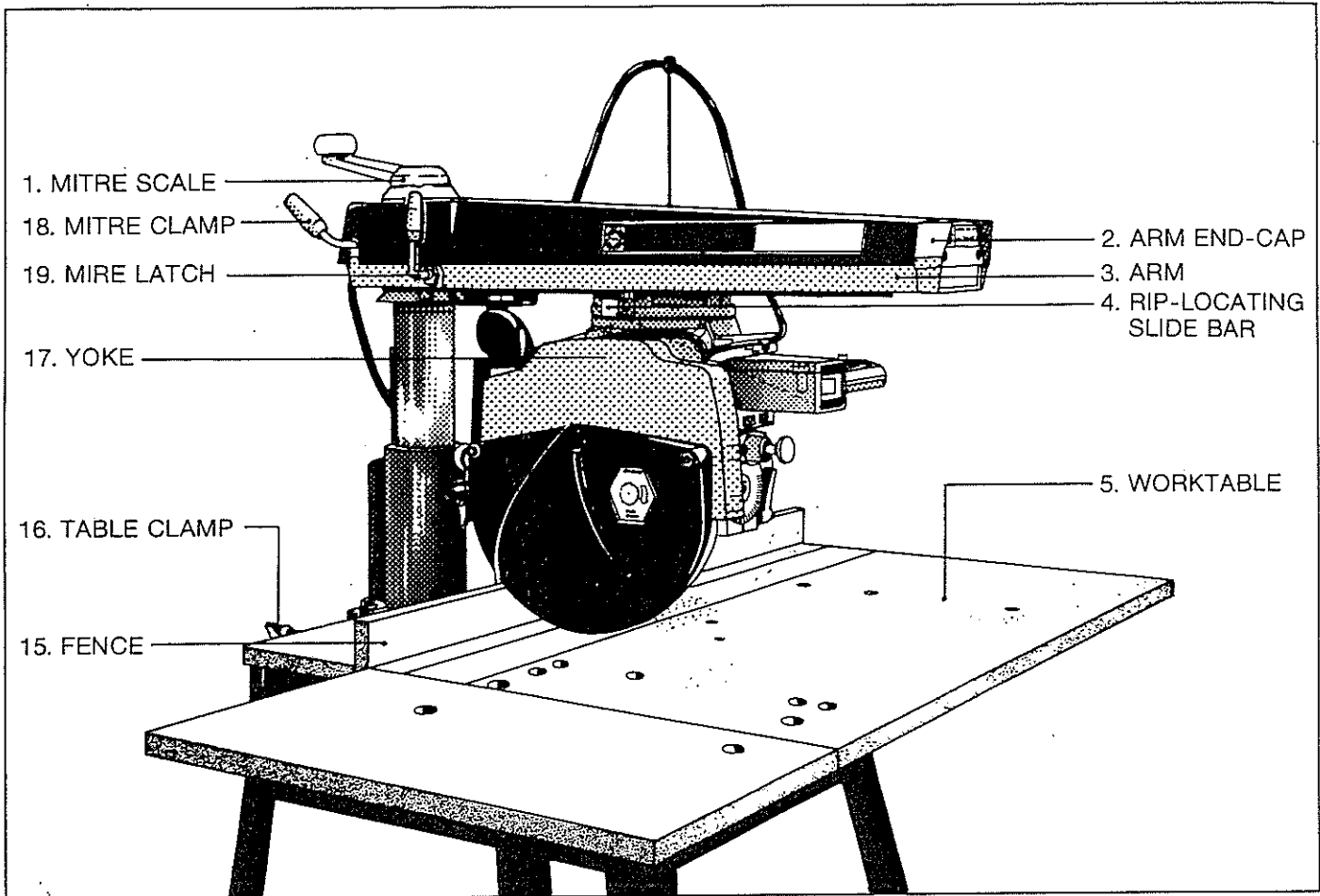


D·WALT





WOOD - TIP OF BLADE 37/8

1. UNPACKING & ASSEMBLY *(Numbers in brackets refer to Controls Illustrations on page 2).*

1. Open the top of the carton.
2. Remove all the loosely-packed table parts and other easily accessible components.
3. Tip the carton carefully until the column-end of the carton is resting on the floor.
4. You will now be able to slide the machine out of the carton single-handed and then tilt the machine forward until it is resting with its base frame on the floor.
5. If you are going to mount the Powershop on to an existing bench, you will find it easier to do this now. If you are going to mount the Powershop on to its optional legstand, we suggest you set up the legstand now and secure the machine to it before proceeding (See para. 12.11).
6. Having identified the elevating handle (6), secure it to the top of the column with the cross-head screw supplied.
7. By turning the elevating handle, raise the arm of the machine so that the carton containing the motor/yoke assembly can be removed.
8. Remove the two allen screws from the arm end-cap (2) and take the cap off.
9. Take the complete motor/yoke assembly out of its carton and carefully insert the three bearings (2 on the left, 1 on the right) of the roller head into the tracks inside the arm. In doing so take care that the rip lock (7) is released and lined up correctly with its slide strip on the lower right-hand side of the arm.
10. Check that the movement of the rollerhead in the arm tracks is smooth by pushing it backwards and forwards along the arm. Check also that the rip lock will release and lock the rollerhead in position as required.
If either of these checks indicates incorrect mounting, remove the rollerhead from the arm tracks and repeat procedure 9 again.
11. Replace the arm end-cap (2) and secure it firmly with the two allen screws.
12. Fix the cable support spring on the arm:

DW1251 Insert end of spring into small hole half way along the top of the arm.

DW15101/3 Fix the end of the spring to the mounting point on the right-hand side of the arm by inserting the screw provided through the end-loop of the spring.

The cable is then routed along the arm and down the back of the column.

2. ADJUSTING TABLE TOP PARALLEL WITH ARM

To obtain accurate woodworking results, it is essential that the table is completely parallel with the arm. The following instructions explain how to do this:-

1. Prepare the base frame for the table boards by setting the 2 angled support brackets (A-Fig. 1) on each side of the frame so that the securing bolts (B) and (C) are at the mid-point in the slotted holes. At this stage the bolts should only be finger tight.

NOTE: Some models feature location pins which pre-set the position of the brackets on the main frame. On these models the bolts can already be tightened, but you should still make the following checks. If they indicate the location pins are wrongly positioned, tap the pins out with a hammer and adjust via the slotted holes in the support brackets.

Use the tip of the motor spindle to act as a gauge to check that the 2 support brackets are on the same plane, as follows:

- (i) Rotate the elevating handle and raise the arm enough to allow the motor to turn 90° into the vertical position.
- (ii) Release bevel latch and bevel lock and turn the motor body until it is vertical. When it reaches the vertical position press home the bevel latch so that the motor is locked into position.
- (iii) Release the arm clamp lever and the rip lock and bring the motor to its fully forward position on the arm.
- (iv) Rotate the arm to bring the motor shaft to a position directly over the left table support bracket. Carefully lower the motor, by turning the elevating handle, until the tip of the motor arbor just touches the support bracket as shown. (Fig. 2)
- (v) Tighten the nut (C), rotate the arm to its 45° position left and move the yoke assembly back along the arm until the shaft is again over the support bracket (Fig. 3). If the motor arbor does not just touch the support bracket here also, gently tap the bracket up or down as required and then tighten nut (B) (Fig. 1). Having tightened both (B) and (C), check once more that the motor arbor just touches the upper surface of the left-hand support bracket over its entire length. If it does not, loosen the nuts and repeat the above procedure.
- (vi) Now move the arm to the right of the machine and repeat this procedure to correctly secure the right-hand support bracket.
- (vii) Carry out a final check, running the tip of the motor arbor along the top of both brackets and make sure that all nuts are completely secure.
- (viii) Now adjust the central table support strip in the same way so that it is perfectly level with the two side support brackets. (Fig. 4).

N.B. It is important not to change the height of the arm during this adjustment procedure.

After completing the above adjustment, return the motor to the horizontal position.

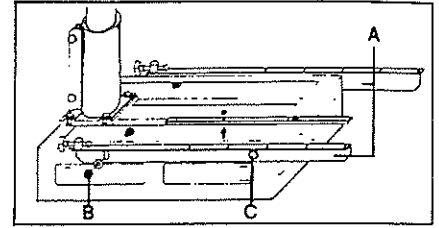


Fig. 1

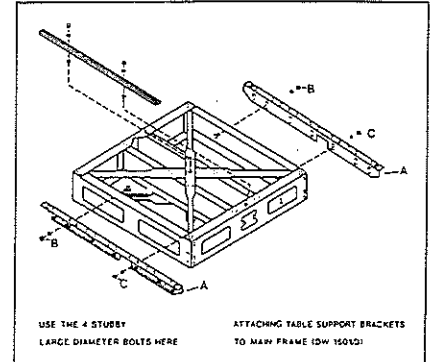


Fig. 1a

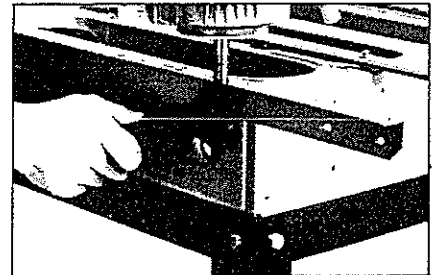


Fig. 2

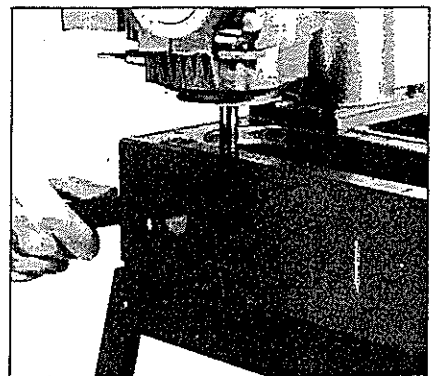


Fig. 3

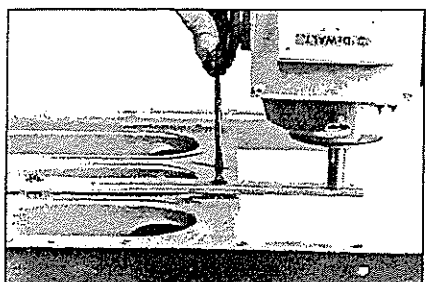


Fig. 4

3. ASSEMBLY OF WORKTABLE ONTO SUPPORT BRACKETS

Note: The worktable comprises 5 elements (Fig. 5): a large fixed portion (F) which attaches to the front of the base frame, a wooden fence (M) against which the material being worked is held and three movable strips of table which are used to adjust the position of the fence relative to the saw blade to ensure the different types/depth of cut can be carried out with safety.

- (i) Secure the front board (F) to the support brackets using the slotheaded bolts (G) and the relative washers and nuts making sure that the holes in the middle of the board locate over the central support flange in the base frame.

Note: The additional holes on the left hand side of the table are for mounting the table side extension.

- (ii) Mount the sawblade (see Fig.6) making sure the lower teeth point towards the back of the machine. Tighten the blade on the shaft using the larger of the allen keys provided to hold the shaft steady while tightening the arbor nut anti-clockwise (left-hand thread) with the large open-ended spanner.

(Note that the brass arbor nut has an inner circular ring rather than being hexagonal across its full width - the nut should always be mounted with this inner ring facing the motor).

- (iii) You can now check that the front board is flat and parallel to the arm across its entire width. To do this, lower the blade so that the bottom tooth just touches the front board on the front left hand side. Then, with the mitre latch and clamp released, swing the arm so that the blade skims the top of the board across its width. If the tip of the blade does not just touch the board all the way across, then with a screwdriver adjust the front adjusting screw in the middle of the board up or down until that is the case. Then move the sawblade back along the arm and adjust the rear adjusting screw in the same way.

- (iv) Mount the blade guard as follows:-
 1. Release the bevel latch (14) and bevel clamp (12) and tilt the motor and blade about 30° to the left.
 2. Loosen the locking screw (P) (Fig. 7) and turn the retaining bracket (N) anti-clockwise until the right hook of the rear black guard (F) can be lifted free of the support lug.
 3. Slide the black guard round clockwise until it reaches the dotted line position in the illustration.
 4. Now lower the guard over the sawblade making sure that the hinged plastic section does not foul against the motor shaft and that the lower metal edge on the other side of the guard engages satisfactorily with the lugs on the motor housing - this will ensure also that the hole on the upper guard bracket locates over the retention bolt on top of the motor.
 5. Place the washer on the bolt and secure the wing nut to hold the guard firmly.

NOTE: Whenever you remove the guard, resecure the wing nut and its washer to the retaining bolt on top of the motor housing so that no parts can be lost.

ALWAYS REPLACE THE GUARD BEFORE SWITCHING ON YOUR MACHINE AND REMEMBER THAT EVEN A STATIONARY SAWBLADE IS SHARP SO TAKE CARE NOT TO CATCH YOURSELF ON THE TEETH.

- 6. Slide the black guard (F) back round anti-clockwise and hook the right-hand end of it onto the support lug, then secure bracket (N) over the same lug by tightening screw (P).

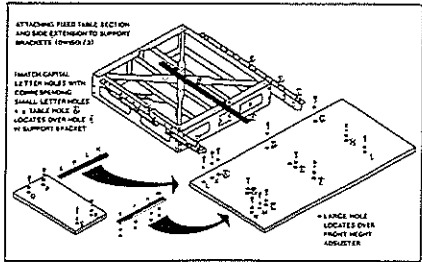


Fig. 4 a

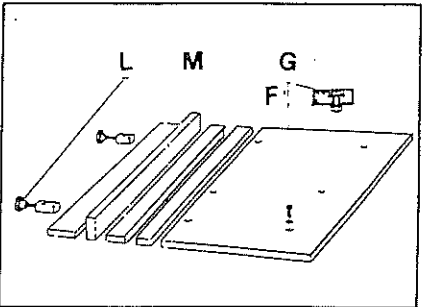


Fig. 5

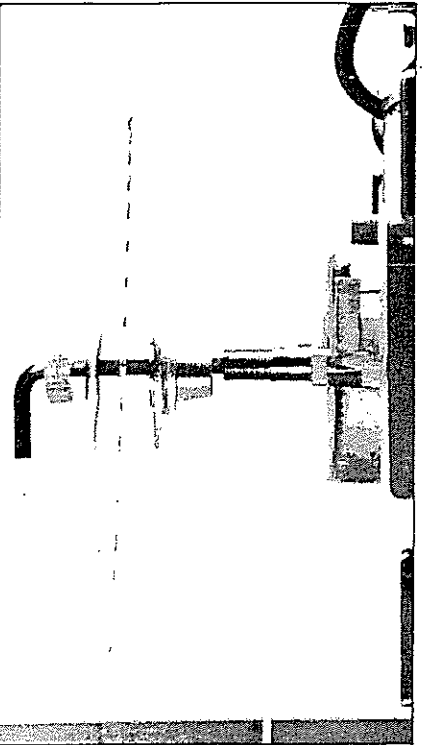


Fig. 6

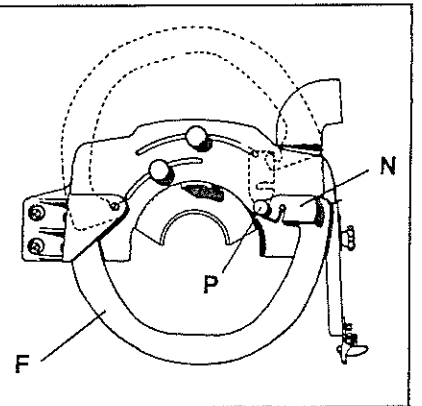


Fig. 7

- (vi) Position the rear table boards and the fence (Fig. 8) according to the material thickness and the type of cut to be carried out.

Note. Never lift your Powershop by gripping worktable or you risk twisting it and therefore having to repeat the support bracket adjustment procedure.

Mounting the Left-Hand Table Extension

Supplied with your Powershop is a left-hand table extension to enable left-hand mitres to be carried out satisfactorily

The extension piece has the same depth as the main fixed table and it attaches to the main machine as follows:

- (i) Two metal support strips are each first secured to the lower left-hand surface of the main worktable.
- (ii) The extension table can now be fixed to the support strips via the slotted holes using the bolts self-tapping screws provided.

FENCE LOCATIONS

The following illustrations show where the fence must be to perform each type of cut according to thickness/width of material.

	MAT UP TO 25mm THICK	MAT OVER 25mm THICK
Straight Crosscut DW1251 DW1501/3	36mm 26mm	130mm 220mm
45° Bevel Crosscut DW1251 DW1501/3	130mm 220mm	130mm 220mm
45° Mitre Cut - L Hand DW1251 DW1501/3	150mm 130mm	225mm 285mm
45° Mitre Cut - R Hand DW1251 DW1501/3	145mm 295mm	245mm 295mm
Rip Cut DW1251 DW1501/3	145mm 30mm	145mm 30mm

Fig. 8

4. CHECKS AND ADJUSTMENTS TO ENSURE ACCURACY

4.1 Checking the Crosscut Travel is 90° to the Fence

NOTE: In carrying out these checks and adjustments you may find it more convenient to remove the sawblade guard but remember that even a stationary sawblade is sharp so take care not to catch yourself on the teeth.

With the mitre latch (19) engaged, lock the clamp handle (18) so that the sawblade is positioned for a straight 0° cross-cut. Release the rip lock (7) and push the saw carriage back so that the sawblade is just in front of the fence. Then, by turning the elevating handle, lower the arm so that the sawblade almost touches the surface of the table in front of the wooden fence.

You are now in a position to check that the blade will cut a line at 90° to the fence. Proceed as follows:-

- (i) Place a rectangular piece of board in front of the fence alongside the blade and lay a square flat on top of it as shown in Fig. 9 with one side flat against the fence and the other alongside the blade.
- (ii) With the lower left-hand part of the blade guard raised (or you may find it easier to remove the guard completely) pull the saw carriage forward away from the fence and check that the tooth on the blade protruding furthest to the left (it will be either on the leading or trailing edge of the blade) stays parallel to the square as you pull the saw blade past the square. If it is not running square, the arm is not at 90° to the fence.

Note: At this stage, do not worry if the face of the blade itself is not parallel with the square. This will be adjusted next. We are now merely checking that the line of the blade across the table is at 90° to the fence.



Fig. 9

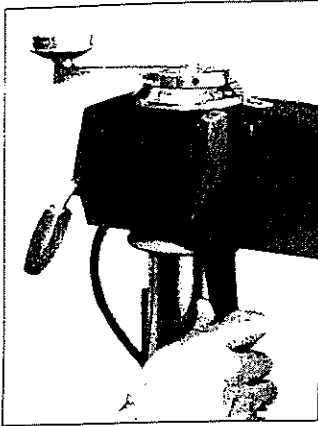


Fig 10

To Adjust the Crosscut Travel

- (i) With the mitre latch engaged in the 0° position, slacken the mitre clamp.
- (ii) Loosen the lock nuts on each side of the arm, as shown in Fig. 10.
- (iii) Release the mitre latch and depending on which way the arm needs to move to give the true 90° crosscut required, loosen and tighten the adjusting flanges on either side of the arm (Fig. 11) if the front of the arm needs to go to the left, loosen the adjusting flange on the right of the arm and tighten the flange on the left. If the opposite is the case, and the arm needs to move to the right, loosen the adjusting flange on the left and tighten the flange on the right. Adjust the flanges a little at a time and re-engage the mitre latch and clamp and check the crosscut travel of the blade relative to the fence with a square. Do not overtighten the adjusting flanges or the mitre latch will be too stiff to operate easily.
- (iv) Once satisfied that the crosscut travel is accurate, retighten the lock nuts on each side of the arm (as in Fig. 10).
- (v) Adjust the pointer on the mitre scale so that it registers 0° in this position.

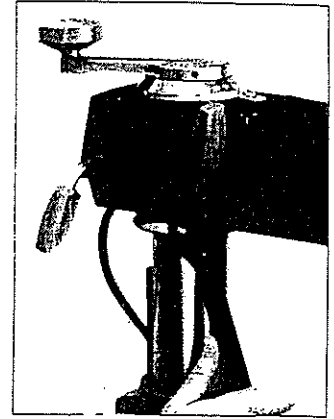


Fig 11

4.2. Checking the Saw Blade is Parallel to the Arm Tracks.

This check is to ensure that, in the straight 90° cross-cut position, the blade runs true across the table and does not run "dog fashion" (Fig. 12). If the blade is incorrectly adjusted in this way, it will produce a cut wider than the set of the blade (distance across the tips of the teeth). It would also tend to cause scorch marks on the timber being cut.

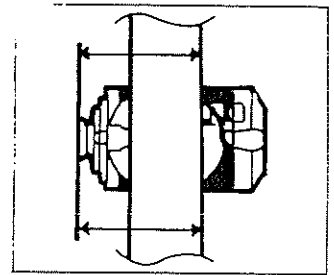


Fig. 12

To Check

- (i) Place a square against the fence as in Fig. 9 and, with the sawblade just in front of the fence in the 90° crosscut position (lock it in that position with the rip lock) check that the left hand face of the blade is parallel to the square. If it is not parallel, adjustment is necessary.

To Adjust

The illustration (Fig. 13) shows the components of the yoke assembly. The precise alignment of rollerhead (8) with yoke (17) is made possible by collar (I) which is fixed to the yoke by the locking nuts (J).

- (i) Firstly, grasp yoke in both hands and check it for movement left or right, if there is movement tighten nut (H) which increases the friction between the rip locating slide bar (K) and nylon block (L).
- (ii) Then, if the blade is still not parallel to the square, release the yoke clamp (10) and loosen the lock nuts (J) (Fig. 13/13a) and turn yoke slightly to left or right until the blade is in fact parallel to the square and therefore also parallel to the arm tracks. Then tighten all nuts.
- (iii) Having adjusted the blade parallel to the arm tracks in this way, release the rip lock and pull the saw carriage forward. Raise the saw blade just above the surface of the table by turning the elevating handle.
- (iv) Now release the rip locating slide bar and the yoke clamp and then rotate the yoke 90° so that the blade is facing the fence and lock it into that position with the slide bar and the yoke clamp. Then push the saw carriage backwards until the blade is resting against the fence.

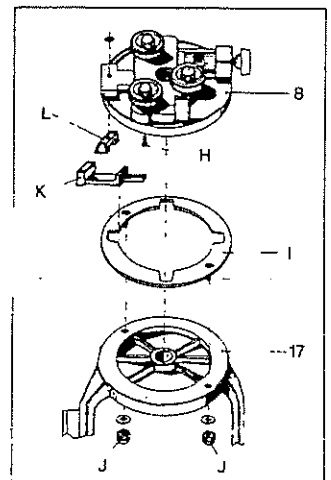


Fig 13

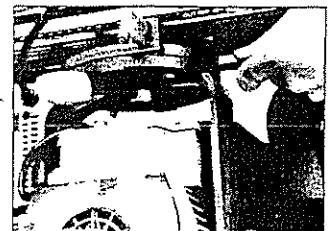


Fig 13a

If the blade is completely flat, across its face against the fence, this will confirm that the saw will perform accurate parallel rip cutting.

If by any chance the blade does not lie flat against the fence then return it to the 0° cross-cut position and repeat the above adjustment procedure (making blade parallel to arm tracks).

4.3 Checking the Blade is Perpendicular to Table

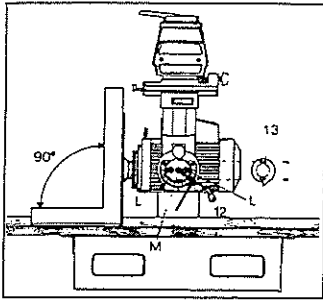


Fig. 14

For accurate woodworking, it is also necessary that the sawblade cuts a precise 90° vertical line when intended to do so.

To Check

With the arm in the cross-cut position and all latches/Clamp handles engaged, place a steel square with one edge on the worktable parallel to the fence (Fig. 14) and the other edge against the left face of the sawblade (make sure the square passes between the teeth of the blade and rests against the inner face). If the blade is not then completely flat against the square, it follows that it is also not at right angles (90°) to the worktable.

To Adjust

- (i) Remove bevel pointer disc (A) by removing the two screws (B) in Fig. 15 and re-engage the bevel latch.
- (ii) Loosen the two outside allen screws (Fig. 16).
- (iii) Tilt the motor left or right until the blade is flat against the square.
- (iv) Firmly retighten the allen screw(s) L.

NOTE: It may be necessary to loosen the centre allen screw (M) slightly before the motor will tilt. If you do so, be sure to secure it again firmly before replacing the bevel pointer disc.

- (v) Replace the bevel pointer disc.

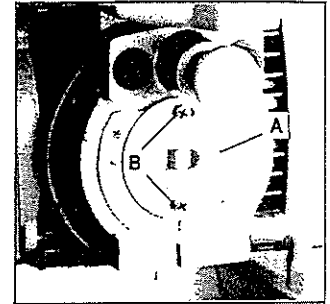


Fig. 15

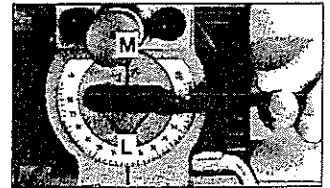


Fig. 16

4.4 Adjusting Roller Head Bearings to Arm Tracks.

In most cases the above adjustments will be all that are necessary to enable accurate sawing with your DeWalt Radial Arm Saw.

However, in time it is possible that play might develop in the adjustment of the roller head bearings to the arm tracks which will cause inaccuracy.

The roller head is suspended by three special bearings (Fig. 17). Two of these are mounted on straight bearing shafts (Q) and the third is mounted on an eccentric shaft (R).

If there is lateral movement between the bearings and the arm tracks, (and you will be able to feel it, if there is) proceed as follows:

- (i) Pull the yoke assembly forward to the end of the arm tracks and lock it in position with the rip lock.
- (ii) Remove the rip scale pointer on the right of the yoke assembly by withdrawing the two Phillips screws.

With the rip scale pointer removed, you have access with an allen key to the locking screw as shown. (Fig. 18). Having slackened this screw, also loosen the 13mm lock nut (J) immediately beneath it. (Fig. 19).

Then release the rip lock and with an allen key via the access hole in the underside of the yoke (Fig. 20) rotate the eccentric bearing (R) slightly until it is sufficiently in contact with the arm track to ensure that all 3 bearings rotate as the yoke assembly is moved backwards and forwards along the arm. If you find it difficult to feel when the adjustment is correct, you may find it easier if you remove the Arm end-cap so that you can see the 3 bearings rotating in the tracks. Once satisfied that the adjustment is correct, retighten the 13mm lock nut and then the horizontal allen screw and replace the rip scale pointer.

NOTE: The top and bottom edges of all three bearings should be in contact with the arm tracks over their entire length and the roller head assembly should move freely but without side-play.

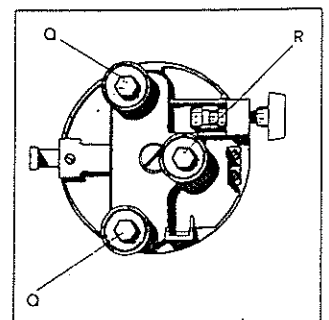


Fig. 17

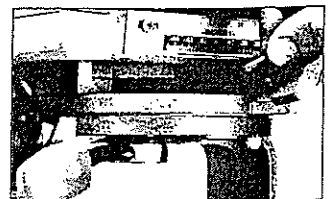


Fig. 18



Fig. 19

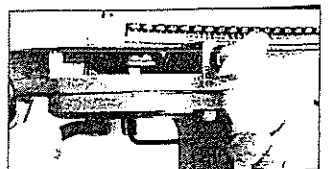


Fig. 20

Note: From time to time, you may find that there is a build-up of dust in the arm tracks or on the bearings - especially after ripping. To maintain accuracy and ease of operation, it will be necessary to clear this dust. This can be done as follows:

- (i) Remove the arm end-cap.
- (ii) The yoke assembly will then come out at the end of the arm.
- (iii) With a clean, dry cloth wipe the arm tracks along their entire length to remove all dust and grease (Fig. 21).
- (iv) With a vacuum cleaner and cloth, clean off all dust on the 3 bearings of the yoke assembly. White spirit can be used if necessary to remove compacted dust.
- (v) Remount the yoke assembly in the arm tracks and replace the arm end cap, making sure all retaining screws are tightly secured.

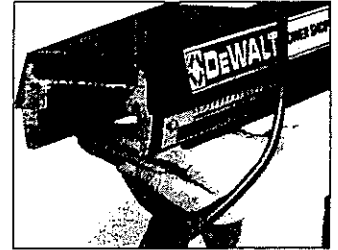


Fig. 21

CAUTION: Never attempt to lubricate the surface of these bearings or the arm tracks, as this can cause premature wear and inaccuracy.

4.5 Adjusting Base to Column

The following adjustment will also normally be unnecessary unless your Powershop has been moved frequently from site to site.

If, after, the mitre latch is engaged in the 0° straight cross-cut position and the mitre clamp is secured, there is still side, or up-and-down, movement at the front end of the arm caused by the column moving in its base, the following adjustment is necessary:

- (i) Loosen the lock nuts (U in Fig. 22) on the 2 brass allen screws on the left of the base (looking from the rear) and then slacken the inner brass screws with an allen key.
- (ii) Turn the elevating handle to move the column up and down. If base is seen to be slack around the column, adjust by unscrewing the two nuts W (Fig. 22a) until the correct fit has been achieved. Avoid binding by overtightening.
If the base is too tight around the column, adjust by unscrewing nuts (X) and tightening nuts (W) for correct fit.
- (iii) Retighten the brass screws against the key on the back of the column and set the lock nuts to hold them in position.

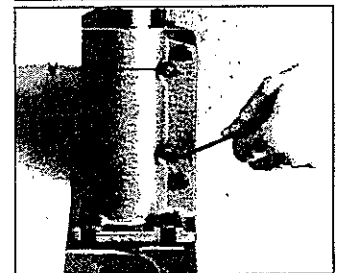
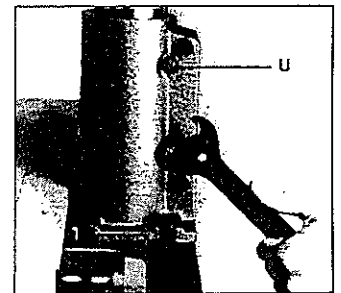


Fig. 22

CAUTION: After carrying out this adjustment, check again the straight cross-cut travel is at 90° to the fence - and adjust if necessary.

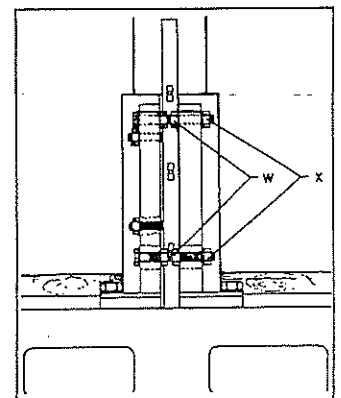


Fig. 22a

5. THE SAWBLADE GUARD

5.1 Mounting the Blade Guard

See instruction 3. (iv)

5.2 Adjusting the Blade Guard

— For Rip Cuts:

- (i) Loosen the 2 knobs (H) (Fig. 23) and slide the riving knife bracket (B) down until the tip of the riving knife (C) is approximately 10mm ($\frac{3}{8}$ ") from the surface of the machine's worktable. The distance of the riving knife from the blade must be between 1-3mm. (adjust by loosening the screws (G) and sliding the knife left or right within the bracket slots).
- (ii) Loosen the knob (Q) on the back of the guard and lower the bracket (D) until the central spring on the bottom of the bracket just touches the surface of the timber (i.e. when the tips of all anti-kickback fingers (L) are positioned at about $\frac{1}{8}$ " below the surface of the wood before you start to feed the timber into the blade). Once the anti-kickback fingers have come into contact with the surface of the timber, they should be at the angle indicated.

Important: It is essential for safe rip-cutting that the anti-kickback fingers are correctly positioned - they prevent the tendency of the blade to throw the timber back towards the operator. Note that the allen screw mounting the anti-kickback fingers onto its support bracket can be loosened to allow the kickback fingers to be angled for bevel-ripping.

It is also important to use the riving knife in its correct position when ripping to prevent the timber binding on the blade.

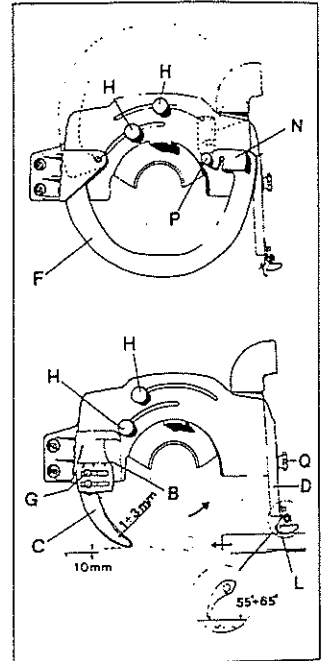


Fig. 23

— For Cross-Cutting:

Neither the riving knife nor the anti-kickback fingers are needed for cross -cuts, so make sure that they are both adjusted up out of the way.

5.3 Removing the Blade Guard

Follow the mounting procedure (3.(iv)) in reverse order.

5.4 Removing the Sawblade

The arbor nut has a left-hand thread, so it is necessary to turn it *clockwise* to remove it from the motor shaft.

- (i) Fit the large allen key supplied into the front end of the motorshaft to hold the shaft steady.
(Note that the brass arbor nut has an inner circular ring rather than being hexagonal across its full width - the nut should always be mounted with this inner ring facing the motor).
- (ii) Fit the large open-ended spanner onto the arbor nut as near parallel to the allen key as possible.
- (iii) Holding the allen key firmly with one hand, turn the large spanner clockwise with the other hand and the nut will loosen.
- (iv) Remove the blade and all flanges on the motor shaft noting the order of assembly and positioning for when you remount the blade.

If the nut is difficult to loosen in this way, use the following method:

- (i) Lock the roller head in position on the arm with the rip lock.
- (ii) Fit the large spanner to the arbor nut only.
- (iii) Position a striking block of wood as shown in Fig. 24.
- (iv) Hold the spanner on the nut, while at the same time, with some force, turning the blade/motor shaft anti-clockwise until the end of the spanner strikes the block and the nut loosens.

CAUTION: TAKE CARE NOT TO CATCH YOUR HAND ON THE EXPOSED TEETH OF THE BLADE AND NEVER TRY TO JAM THE MOTOR FAN AS A MEANS OF HOLDING THE SHAFT STATIONARY.

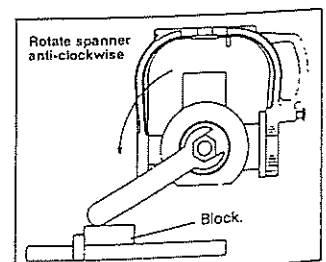


Fig. 24

6. MAKING A TRIAL CUT

Having completed the above adjustment procedure, it is now time to make a straight cross-cut in a piece of timber.

Note: If, when you were setting up your machine, the saw carriage travel was not as smooth as you would expect, that probably means there are pieces of polystyrene packing stuck either to the arm tracks or to the 3 bearings on the yoke assembly. With a clean, dry cloth wipe both the tracks and the bearings to eliminate this.

6.1 Wiring up to the Mains

Single-Phase 240v Models

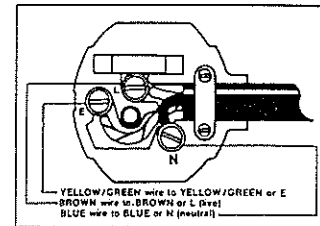
Connect a standard 13 amp rubber-covered earthed plug to the cable attached to the machine as shown in the illustration. Make sure that the cable clamp is holding the outer sheath of the cable securely before fixing the cap to the plug.

Plug in and switch on at the mains socket.

Three-Phase 415v Models

Three-phase machines should be wired directly into the mains by a suitably qualified electrician.

The no-volt release switch box should then be mounted to the front of the machine beneath the table so that easy access is provided to the 'stop' button in case of emergency.



6.2 Making the Cut

- (i) With the mitre lock engaged, lock the arm clamp handle so that the sawblade is positioned for a straight 0° cross-cut.
- (ii) Release the rip lock and push the saw carriage back so that the sawblade is behind the fence in its correct position depending on the material thickness (See Fig. 25).
- (iii) Now, by turning the elevating handle, lower the arm so that the sawblade almost touches the surface of the table. Place the piece of timber against the front of the fence.
- (iv) Gripping the switch handle, press the right-hand side of the push-button switch with the thumb of the same hand.
- (v) Once the sawblade has reached maximum speed (after a short speed build-up of 2 or 3 seconds) rotate the elevating handle to allow the blade to just cut a shallow groove or kerf in the surface of the table.
- (vi) Now pull the saw blade slowly towards you so that it cuts a vertical slot in the wooden fence and through the piece of timber, and then push the carriage back to the column.
- (vii) Now switch off the machine by pressing the left-hand side of the switch.

With a set square check that the cut in your piece of timber is a true 90° in each plane. If it is not, then further adjustment is necessary and refer back to the appropriate instruction.

Note: The control switch on your Powershop incorporates 3 very useful features:

- (1) It "locks on" so that thumb pressure does not need to be maintained — useful when ripping (obviously) but also advantageous for left-hand operators.
- (2) There is motor overload protection built into it removing power from the motor in the event of it overheating.
- (3) It has a "no-volt release" so that if there is a removal of power the switch has to be deliberately re-actuated before the motor will run.

FENCE LOCATIONS

The following illustrations show where the fence must be to perform each type of cut according to thickness/width of material.

	MAT. UP TO 25mm THICK	MAT. OVER 25mm THICK
Straight Crosscut		
DW1251	380mm	350mm
DW1501/3	465mm	420mm
45° Bevel Crosscut		
DW1251	330mm	330mm
DW1501/3	420mm	420mm
45° Mitre Cut - L-Hand		
DW1251	260mm	275mm
DW1501/3	330mm	285mm
45° Mitre Cut - R-Hand		
DW1251	245mm	245mm
DW1501/3	255mm	255mm
Rip Cut		
DW1251	640mm	640mm
DW1501/3	730mm	730mm

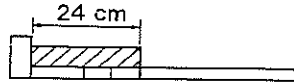
Fig. 25

7. SCALE ADJUSTMENTS

7.1 Rip Scale

The rip scale is located on the right side of the radial arm. When the motor is positioned with the blade facing the column, that is called the "in-rip" position and your material must be fed through the blade from right to left. When the motor is positioned with the blade facing the operator, that is called the "out-rip" position and the material must be fed from left to right. The pointer indicating the ripping width on the scale is adjustable as follows:

1. Place a fence in its rear most position as shown:



and place a board of Known width (24 cm) against the fence.

2. Position the motor in its "out-rip" position (blade towards the front of the machine) and move the yoke assembly along the arm until the blade just touches the forward edge of the material.
3. Loosen the two screws on the pointer assembly and move the pointer until the edge of the "out-rip" pointer lines up with the known width of the board on the lower scale. Tighten the two screws.
4. Now remove the board and reposition the fence as shown:



5. Pull yoke assembly to front of arm and place motor in its "in-rip" position (blade facing towards column) and move the yoke assembly back along the arm, raising the guard to allow the blade to rest against the front face of the fence.
6. The "in-rip" pointer should now line up with the zero position in the upper scale (adjust if necessary).

Note: It is generally good practice to check the width of cut with a tape rather than solely on the scale, although the scale can be used with complete confidence when making several cuts at differing widths (i.e. +5mm or -7mm relative to the first cutting width).

7.2 Bevel Scale

The bevel scale is located on the front of the motor beneath the switch handle. When the blade is positioned for a vertical cut, the pointer should be at zero on the scale. To adjust, loosen the screws retaining the pointer disc, and move the disc until the pointer points to '0' and then retighten the screws.

7.3 Mitre Scale

The mitre scale is located on the top of the arm beneath the elevating handle. On top of the arm is a pointer which can be adjusted to align with the '0' when the arm has been correctly positioned and clamped for a straight cross-cut. The scale is then marked 0°-50° to left and right. The mitre latch engages with machined locations to provide accurate 45°—0°—45° positioning.

8. CLAMP HANDLE ADJUSTMENTS

- (i) The **Mitre Clamp** handle (18) may need to be adjusted if its secure position means it hinders use of the elevating handle. In such a case, simply slacken the clamp handle and push it into the casting so that the nut on the other end protrudes from its surrounding casting. You can then tighten up the nut half a turn and pull the clamp handle back out so that when it is again retightened it does not obstruct the elevating handle.
- (ii) The **Bevel Clamp** handle (12) may be adjusted in the same way as in (i) above but you may find it easier to do so with the motor in its vertical position.
- (iii) The adjustment of the yoke clamp is a little more involved.
If you find that the **Yoke Clamp** has insufficient movement to satisfactorily clamp the yoke securely, adjust as follows:
 - (a) Remove the arm end-cap.
 - (b) Remove the complete yoke assembly from the arm tracks.
 - (c) While levering the spring steel locking flange downwards with a screwdriver (as shown in Fig. 26) so that it will pass over the lug on the yoke casting, turn the central bolt in the top of the yoke with a large screwdriver so that the locking flange underneath moves on one segment past the lug.
 - (d) Having removed the small screwdriver used as a lever, check that the clamp does lock satisfactorily within the movement arc available and then return the yoke assembly to the armtracks.
NOTE: While the yoke assembly is removed from the arm, take the opportunity to clean the bearings and the arm tracks with a clean dry cloth.
 - (e) Replace the arm end-cap.

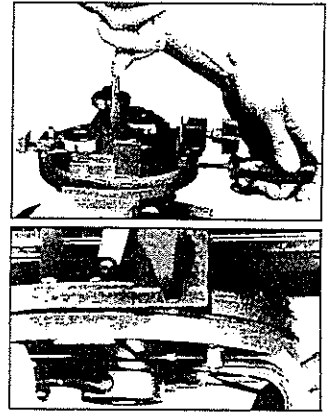


Fig. 26

9. HINTS ON GENERAL CARE OF YOUR POWERSHOP

1. Keep the machine clean for efficient operation. A build-up of dust in the immediate vicinity of the machine could be hazardous and lead to inaccuracy.
2. When changing or remounting the sawblade, make sure that the blade and adjacent flanges are clean before securing.
3. Keep the worktable clear of sawdust. Just a small amount of dust between the fence and the material to be cut could cause inaccuracy.
4. From time to time wipe the arm tracks with a clean, dry cloth to eliminate dust build-up which can ensue particularly after a lot of rip cutting or sanding. To clean the arm tracks and the 3 yoke bearings, you may find it easier to detach the arm end cap and remove the yoke assembly completely from the tracks. White spirit can be used if necessary to remove compacted dust.
If you remove the yoke assembly, when replacing it be sure to tighten the retaining screws in the arm end cap securely.
5. Never attempt to lubricate the surface of these bearings or the arm tracks, as this can cause premature wear and inaccuracy.
6. When carrying your Powershop resist the temptation to lift it by gripping the worktable — grip the base frame instead. If you lift it by the worktable you risk twisting it and therefore reducing the accuracy of your machine.

10. THE VARIOUS OPERATING ADJUSTMENTS OF BASIC MACHINE

The numbers in brackets refer to those in the "Controls" illustrations on page 2

10.1 Arm Rotation

The radial arm rotates to right or left for mitre cuts. Release the mitre clamp handle (18) and the mitre latch (19). Then swing the arm (2) right or left to the required angle. Then lock the clamp handle(18).

The calibrated mitre scale (1) is just below the elevating handle and indicates the angle of the arm relative to the '0' straight cross-cut position.

The mitre latch (15) is only used to locate the arm in the 0° and 45° positions but adopt the habit of using the mitre clamp handle also to secure the arm in this, as well as any other, position.

10.2 Blade Height

The Radial Arm, and hence also the Saw blade, can be raised or lowered by turning the elevating handle (6) on top of the column. Each complete rotation of the handle moves the blade up or down by about 3mm.

10.3 Yoke Assembly Rotation

Changing from cross-cut to the rip position takes only seconds.

Release the rip slide bar (4) and the yoke clamp (10) and then swing the yoke to right or left. The yoke locks automatically at the four 90° positions, but remember to always secure the yoke clamp also to maximise accuracy.

10.4 Blade Tilting

Turn the elevating handle to raise the sawblade well above the table. Release bevel clamp (12) and bevel latch (14). Tilt the motor to the desired angle on the bevel scale. With clamp released, the latch will automatically locate in the popular 0°, 45° and 90° angle positions.

11. MAKING THE BASIC CUTS

11.1 Cross Cut (Fig. 27)

- (i) Set the radial arm at right angles to the fence, registered as 0° on the mitre scale beneath the elevating handle. Lock the mitre latch in position and tighten the arm clamp handle.
- (ii) Turn the elevating handle to lower the blade into position behind the fence in its correct position for the thickness of the material being cut (See Fig. 25). To cut right through the material to be sawn it is necessary to cut a shallow groove or kerf also in the table top. If such a groove is not already there, switch on the motor before the blade actually touches the table surface so that it will cut into the table slightly when lowering continues. Switch off the motor.
- (iii) Place material on worktable and hold firmly against the fence, keeping your thumb and fingers well away from the path the sawblade will take.
- (iv) Switch on motor and draw the sawblade through the fence and across the material to make the cut. You will find that you do not need to pull the motor assembly forward - rather you will need to limit the speed of travel in the cut otherwise the blade will tend to jam.
- (v) After completing the cut, switch off and carefully return the sawblade to its rest position behind the fence.

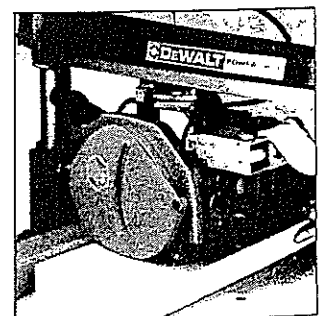


Fig. 27

11.2 Mitre Cut (Fig. 28)

- (i) Release the arm clamp handle and the mitre latch.
- (ii) Swing the arm to the required angle shown on the mitre scale.
The mitre latch should be used to locate the arm at the 0° straight cross-cut position and at the 45° mitre positions, together with the clamp handle. At intermediate angles, lock the arm in position with arm clamp handle only.
- (iii) The fence should be placed in position depending on the thickness of the material (See Fig. 25).
- (iv) Proceed to make the cut in the same way as for crosscutting. Remember that you will need to cut slightly into the table surface to cut right through your material and each mitre angle cut will require a different slot cut in the fence.
- (v) When cutting a left-hand mitre (Fig. 29), you will probably require a different fence position from that needed when cutting the corresponding right-hand angle. You will also need to slide the fence and moveable table strips into position behind the left-hand table extension.

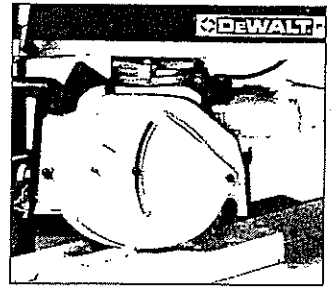


Fig. 28



Fig. 29

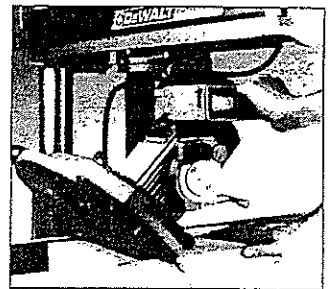


Fig. 30

11.3 Bevel Cut (Fig. 30)

- (i) Set arm as for 0° cross cut.
- (ii) Rotate the elevating handle to raise the blade well above the surface of the table.
- (iii) Release the bevel clamp handle and the bevel latch.
- (iv) Tilt the motor in the yoke to the required angle on the bevel scale.
- (v) The bevel latch enables you to accurately locate the 0°, 45° and 90° positions, but use the bevel clamp handle as a secondary lock. If any other angle is required, the bevel clamp on its own will hold the motor rigidly in position.
- (vi) Place the fence in position depending on the thickness of material (See Fig. 25).
- (vii) Then, with the sawblade still behind the fence, carefully lower the blade with the motor running until it just cuts into the table surface. The blade can then be drawn through the fence and into the material.

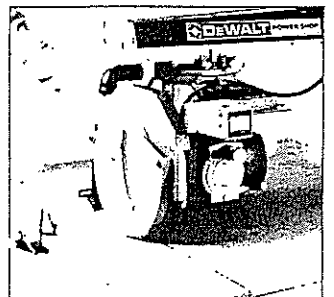


Fig. 31

11.4 Ripping (Fig. 31)

- (i) Set the arm as for cross cut.
- (ii) Pull the yoke assembly out to the end of the arm.
- (iii) Release the rip locating slide bar and the yoke clamp.
- (iv) Revolve the motor 90° to the right for out-ripping on wide panels (Fig. 31) or 90° to the left for in-ripping narrower cuts (Fig. 32), positioning the fence accordingly (Note: Photo actually shows machine bevel-ripping).
- (v) Make sure the slide bar locates positively in the appropriate yoke slot and the clamp is tightened once again to lock the yoke in position.
- (vi) Position the yoke assembly along the arm for the desired width of rip cut, using the rip scale on the right side of the arm, and lock the yoke assembly in position with the rip lock.
- (vii) Now, adjust the sawblade guard as described in section 5.2. Then turn the dust ejection spout so that dust is not thrown into your face.
- (viii) Then, following the instruction label on the top of the arm, switch on the machine and, with the material firmly against the fence, feed it evenly and not too quickly into the revolving saw blade.
- (ix) When you have finished the cut, switch off the machine by pressing the main switch again.

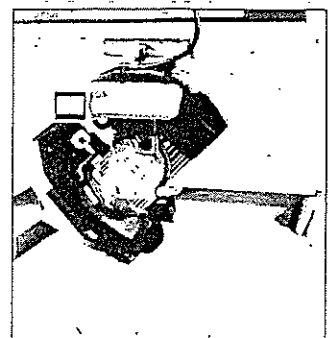


Fig. 32

- IMPORTANT:**
1. Use a notched "push-stick" (Fig. 33 and see drawing in Fig. 41) to feed the wood through the blade and hold it down at the same time, thereby keeping your hands at a safe distance from the blade.
 2. Before switching on the motor for ripping, make sure the riving knife and anti-kickback fingers are correctly positioned for safe operation.
 3. After the ripping operation has been completed, you may find that sawdust has collected in the arm tracks and on the yoke assembly's bearings - to clean, follow the instructions on page 11.

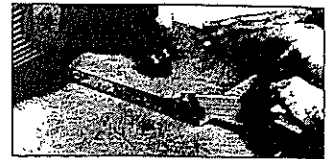


Fig. 33

11.5 Bevel Ripping (Fig. 32)

- (i) Set the machine in the bevel cross-cut position as above.
- (ii) Then rotate the yoke assembly into the rip position as described for ripping above.
- (iii) Using the rip lock locate the yoke assembly on the arm for the correct ripping width.
- (iv) Angle the anti-kickback fingers so that they will be flat on the material being cut (Fig. 34) and lower the riving knife.
- (v) Then proceed with the cut as for ripping.

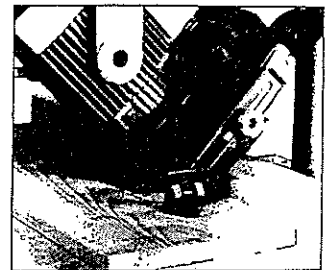


Fig. 34

11.6 Compound Mitre (Fig. 35)

The compound mitre cut is a combination of a bevel and a mitre cut.

- (i) Set the machine in the bevel position.
- (ii) Release the arm clamp handle and the mitre latch.
- (iii) Swing the arm into the required mitre position then relock the arm clamp handle.
- (iv) Draw the saw across the material as for mitre cuts.

Note: You may find it advisable to clamp the material to the fence to hold it firmly while cutting.

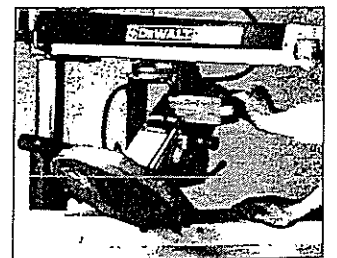


Fig. 35

11.7 Coving/Hollowing (Fig. 36)

By tilting the motor with the blade rotating in the work, you can produce many shapes not possible with conventional sawing systems. In Fig. 36, a shallow concave profile is being cut. Having tilted the blade and rotated the motor yoke beneath the arm, the material is fed through as for ripping. By changing the angle combinations, an infinite variety of widths and pitches of channel can be made.

The optional Powershop Handbook gives further examples of how this feature of your machine can be utilised.

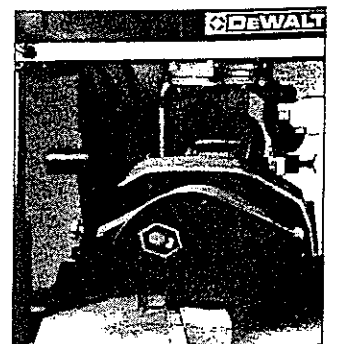


Fig. 36

11.8 Dishing (Fig. 37)

By releasing the bevel clamp and disengaging the bevel latch with an appropriately shaped piece of wood, the rotating blade can then be tilted through an arc to cut a shallow hollow in the surface of a piece of wood clamped to the table. The blade is then returned to the 0° upright position and the elevating handle wound down half a turn before tilting the rotating blade again and repeating this procedure until the required depth has been reached.

It is necessary to hold both the blade guard and the other end of the motor while cutting progresses to avoid undue flexing and pressure being placed on the blade guard and its mounting.

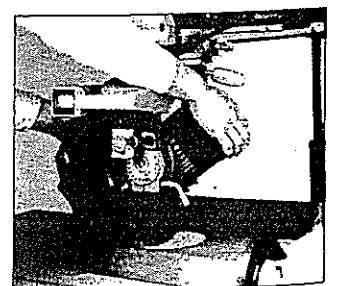


Fig. 37

11.9 Circle Cutting (Fig. 38)

Although a circular saw is normally thought of as only able to make straight cuts, cutting perfect circles is also quite straightforward on your radial arm saw using only the standard circular saw blade.

Cramp a false table to the main one, or substitute a strip as thick as the table itself in place of the fence. Use a woodscrew as a pin and screw this part way into the chosen aid, and then saw the head off. Make a hole in the underside of the wood, from which the circle is to be formed, and then fit to the pin. Lower the blade just clear of the wood, and lock the carriage at a tangent to the proposed circular cut. Hold the wood firmly and lower the arm by half a turn. Then using both hands rotate the wood on the pin in a clockwise direction against the blade. After each revolution lower the arm by half a turn until all the waste is cut away, and the circular piece is formed.

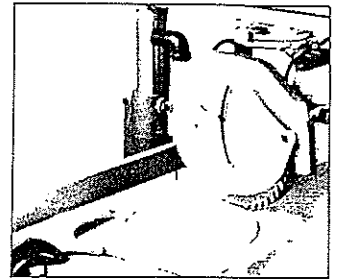


Fig. 38

12. OPERATION OF THE MACHINE WITH OPTIONAL ATTACHMENTS AND ACCESSORIES

Even in its standard form with the basic general purpose sawblade, the Powershop is already more versatile than any other type of sawing system.

The range of optional attachments, however, add a further dimension to your woodworking potential. They will turn your Powershop into a complete workshop.

You will find the optional TCT saw blades prove advantageous, particularly when cutting hardwoods and man-made materials. TCT blades require less frequent sharpening and have a much longer life than ordinary steel blades.

Note: Never use blades larger than 250mm diameter — an imperial 10" blade measures 254mm diameter and is therefore too large.

Before mounting or changing any attachments or accessories, disconnect your Powershop from the mains power supply.

12.1 Shaping/ Moulding

Adding that professional finish to your work with a clean decorative edge is quick and easy with the optional DeWalt Shaping Head attachment (Fig. 39). It can also be used for cutting round grooves and for drawer, and tongue and groove joints. The range of cutter profiles available is illustrated in the list at the back of this booklet.

The DeWalt Shaping/Moulding Head is mounted on the motor arbor as follows:

- (i) Remove the saw blade guard, arbor nut, blade flanges and saw blade.
- (ii) Mount the special back flange(s) (supplied with the Shaping Head) onto the motor arbor.
- (iii) Now put the Shaping Head on the motor shaft with the recessed centre facing outwards and then lock it into position with the special clamping nut, using the special box spanner (Fig. 40).
- (iv) Fit the required pair of shaping knives in the Head or Block carefully setting them so they both protrude to the same extent beyond the outside edge of the Block itself.

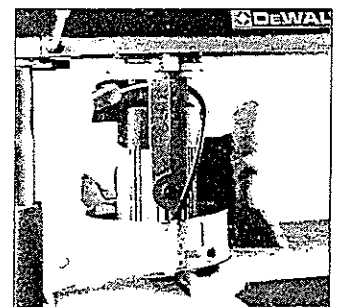


Fig. 39

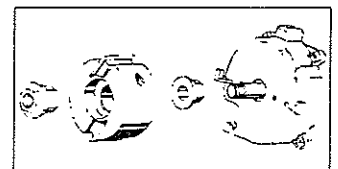


Fig. 40

- (v) Now, tilt the motor to its 90° position on the bevel scale so that the Shaping Head is horizontal.
- (vi) Before operating the machine you should now mount the special Shaping Head guard and adjust its position depending on the depth of knife profile you intend to use (Fig. 39)
- (vii) Position the yoke assembly on the arm so that only the amount of knife profile required extends in front of the fence. The height of the Shaping Head above the table will depend on the height of your material and the position the moulding is to trace on it. If the Shaping Head needs to be in a position otherwise obstructed by the fence, you have the following two options:

- EITHER A Cut away a section of the existing fence to provide sufficient space for the block and guard to protrude through it*
- OR B Position two pieces of timber (of the same thickness as the fence provided) in the fence position, one on either side of the moulding block

***Note:- If you choose option A, it is recommended that you replace the modified fence with a complete new fence for normal sawing operations.**

- (viii) Having locked the yoke assembly into position on the arm with the rip lock and positioned the guard so that it just clears the material, feed the material firmly and evenly along the fence from the right into the shaper cutters. Maintain positive pressure

IMPORTANT: Use a piece of waste wood as a pusher (Fig. 41) to make sure your hand keeps a safe distance from the knives.

- (viii) An infinite variety of profiles can be cut using the Shaping Head by varying the height of the cutter presented to the wood (Fig. 42)

NOTE: Figs. 39, 40 feature the DeWalt Premium Quality Shaping Head which is designed for the more intense, larger profile shaping, rebating applications. There is also available, however, a general-duty shaping head (Fig. 43), which is perfectly satisfactory for slow-feed, fine-finish applications and has a similarly wide range of compatible cutters.

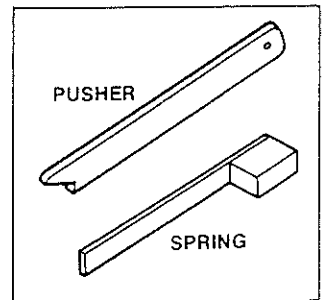


Fig. 41

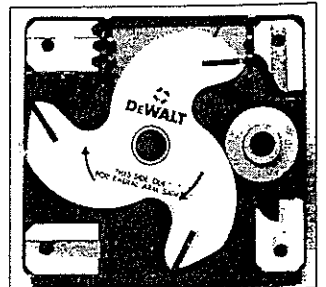


Fig. 43



Fig. 44

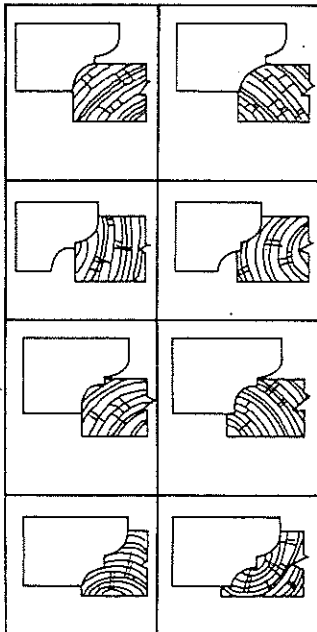


Fig. 42

12.2 Rebating

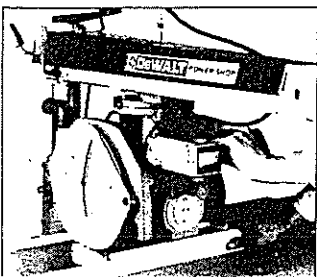


Fig. 45

- (i) With the straight-edged knives mounted, the Shaping/Moulding Head can also be used for narrow rebating, in the same way as described above
- (ii) If wider rebates are required, then a Dado Head should be fitted (see separate instructions) but the guard used should be that intended for the Shaping Head. The operation, using the Dado Head in this way, is the same as with the Shaping Head (Fig. 44). Note the use of home-made wooden springs to help in ensuring the timber is held firmly against the fence while cutting progresses (see Fig. 41).
- (iii) Again the motor can be tilted for bevelled rebate cutting.
- (iv) If the rebating is necessary for a mortice and tenon joint, then the Dado Head can be used in the normal cross-cut position with repeated passes of the Head across the material until the required width of rebate has been obtained (Fig. 45).

12.3 Ploughing / Grooving

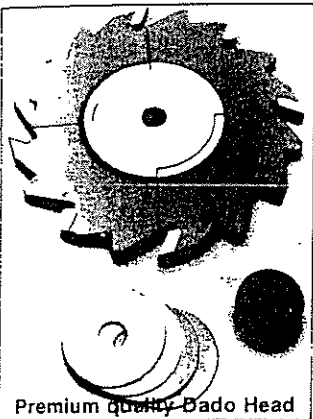
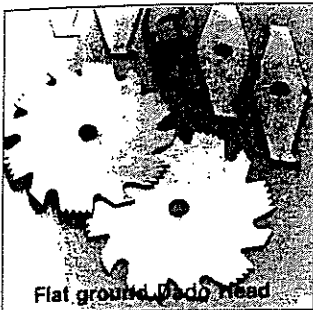


Fig 47

Note: In this upright position, however, it is essential that the Dado Head is covered by the standard sawblade guard (with the riving knife assembly removed) and *not* the Shaping Head guard.

With repeated passes, the ordinary saw blade will often cut grooves adequately. When a wider groove is needed a Dado Head is more appropriate (Fig. 46). It is also ideal for cutting rebates and housings, making a wide deep cut in one pass.

Set at an angle the Dado Head can be used to make the grooves for staircases (mitre position), long grooves and rebates (rip position), and mortices or tenons (blade horizontal).

There are two types of optional Dado Head available for your machine (Fig. 47). The flat-ground type is the cheaper of the two but is perfectly adequate for intermittent use. The premium-quality Dado Head has a longer-life and is resharpenable again and again for relatively intensive Dado-ing. It is therefore correspondingly more expensive than the first.

Mount the Dado Head as follows:

- (i) Remove the sawblade and its related flanges.
- (ii) Mount the special back spacer on the motor arbor with the narrower side towards the motor.
- (iii) Mount the Dado Head on the shaft, having inserted the necessary number of chippers or shims between the two cutter sections to obtain the width of cut required.
- (iv) Secure the Dado Head on the shaft with the standard sawblade arbor nut (left-hand thread).
- (v) Mount the standard sawblade guard, having removed the riving knife and its support bracket completely from within the guard (Fig. 48)
- (vi) Then, by rotating the elevating handle lower the Dado Head into position for the depth of cut required.

It may be necessary to place a supplementary table on top of the standard worktable to raise the work sufficiently depending on the depth of cut / thickness of material

Note: If you are dado-ing only in the crosscut or mitre positions, the anti-kickback fingers on the back of the guard should be adjusted up out of the way. If, however, you are dado-ing in the rip position, the direction of material feed is the same as for sawing and the anti-kickback fingers must be adjusted down so that their tips are $\frac{1}{8}$ " below the surface of the material until the wood is fed through, when the fingers should adopt the angle illustrated in Fig. 23.

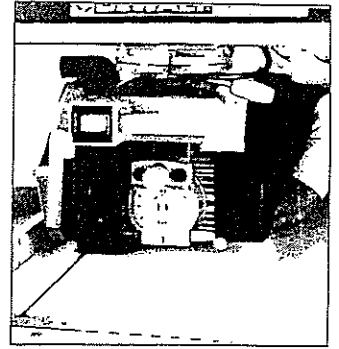


Fig. 46

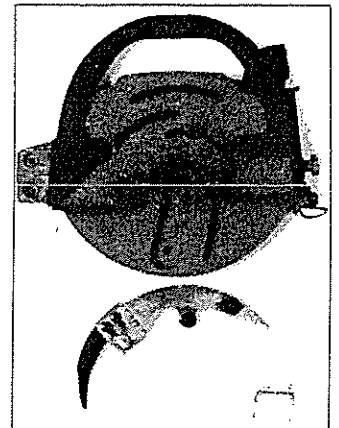


Fig. 48

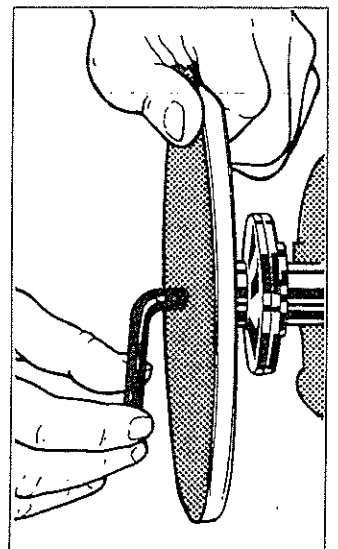


Fig. 49

12.4 Disc Sanding

The basic machine if properly adjusted with a sharp blade produces a clean cut that normally requires no further finishing. For jobs needing a final sanding or having a difficult shape, the two optional sander attachments can be used for sanding cuts at any angle. The disc sander is ideal for large scale flat sanding.

The disc sander mounts directly onto the spindle (Fig. 49).

- (i) Remove the sawblade guard and the blade itself.
- (ii) Return the outer sawblade flange to the spindle so that both the inner and outer flanges are flat against each other.

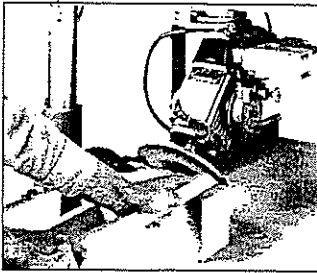


Fig. 50

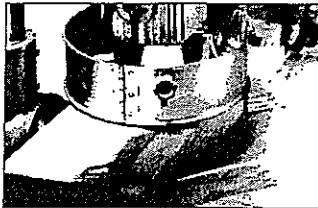


Fig. 51

- (iii) Now screw the Disc Sander onto the spindle and, using the same angle adjustments as when a sawblade is mounted, position the sanding disc at the angle required.

If the sanding operation requires movement of the yoke assembly (as in a bevel or straight crosscut position), make sure the material is held firmly on the table.

If the operation requires the movement of the material past the disc, then the material must be held firmly in both hands, while the yoke assembly is locked on the arm by the rip lock.

When using the Disc Sander as a sanding table (Fig. 50) you may find it easier to clamp a false table alongside it to support your material higher up against the disc.

Always use the downward (right-hand) side of the disc, otherwise you will find it difficult to hold the material steady.

In most sanding positions a guard is unnecessary. However, when using the disc for horizontal sanding (Fig. 51), the Shaping Head guard should be mounted and adjusted up so that the sanding disc is just clear of the underside of the guard.

When removing the Disc Sander you will find it necessary to hold the motor shaft steady with the allen key supplied with the machine.

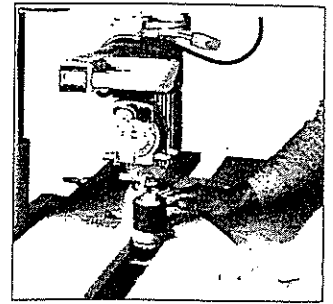


Fig. 52

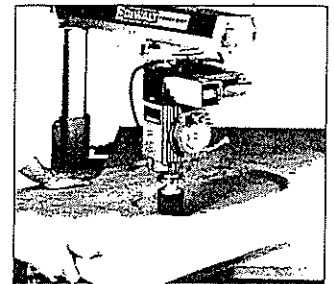


Fig. 53

12.5 Drum Sanding



Fig. 55

The optional Drum Sander enables easy, accurate sanding of contours and irregular shapes (Figs. 52/53), which otherwise can only be sanded by hand.

The Drum Sander screws directly onto the motor spindle, with the sawblade flanges mounted in the same way as for the disc sander above (Fig. 54).

The height and angle of the Drum Sander can be altered in the same way as with other attachments (Fig. 55).

No guard is necessary.

When using the Drum Sander vertically you may find it advantageous to remove the fence and/or the rear table strips, thereby allowing plenty of space for your material to be moved around the Sander.

Always feed your material against the rotation of the Drum Sander.

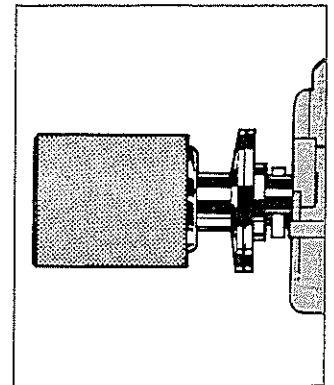


Fig. 54

12.6 Sabre Sawing



Fig. 58

By mounting the optional Sabre Saw attachment on the motor spindle in place of the sawblade, you can turn your machine into a radial sabre - or jigsawing machine.

- (i) First mount the special back spacer onto the spindle (Fig. 56) and then stabilise the sabre saw attachment on the shaft with the steady struts locating on the special lugs in the motor housing.
- (ii) Finally, use the standard arbor nut to secure the attachment on the shaft.

You can then position the sabre sawblade depending on the requirements of the job. In most (Fig. 57) cases the best position will be as with the Drum Sander above:-

- remove the table fence and substitute it with wooden spacers 20mm thick and then position the blade (teeth forwards) just behind the front table section (Fig. 58) and low enough so that the shoe of the attachment will slide across the upper surface of the material being cut.

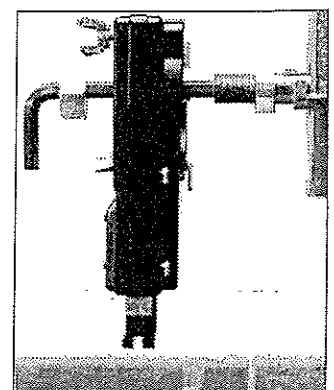


Fig. 56

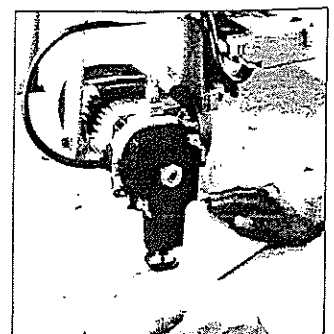


Fig. 57

12.7 Routing

The mounting of one of the optional Router Brackets, enabling you to fit a portable Router to your Powershop, broadens the scope enormously for accurate, decorative woodworking with your machine.

There is a choice of two mounting brackets:-

One is suitable for the Black & Decker DN66 Woodworker or any other with a $\varnothing 43\text{mm}$ collar. The other will enable most ELU Routers (MOF 96/31/98/77) to be secured to your Powershop.

Since the Router itself will be operating and not the Powershop motor, you can disconnect the Powershop completely from the power supply.

The mounting procedure is as follows:-

- (i) Remove the blade guard, blade and all flanges from the motor shaft.
- (ii) Position the router bracket over the end of the Powershop motor shaft, carefully locating the lugs of the bracket behind the lugs on the end of the machine's motor housing (Fig. 59). In lining these up correctly, the hole in the upper arm of the bracket will also locate over the standard guard retaining bolt on the top of the motor housing, where it can be firmly secured with the wing nut supplied.

(iii) $\varnothing 43\text{mm}$ Collar Routers

The router's normal control/plunge assembly must be removed (Fig. 60) to expose its 43mm collar, which is then secured in the Yoke (Fig. 61).

ELU Router Bracket

The bracket for ELU Routers comes with two pairs of support bars (Fig. 62). These are inserted through the router base in place of the side fence rods. The small diameter bars are used for the MOF96 and are positioned on the bracket as shown (Fig. 63).

The larger diameter bars fit the MOF31/98/77 models as shown (Fig. 64) with the matt finish bar bolted to the rear of the router base and the other mounted through the base in place of the side fence rod.

Note: Whichever ELU router is used, the router must be held securely in the bracket by the nuts on the ends of the bars and the router must also be centred on the bars and held firmly in the position with the locking screws which would normally lock the router side fence in position.

- (iv) You are now in a position to fit the cutter of your choice into the router and begin working. You can either hold the router in a fixed position (Fig. 65), at whatever angle is required to provide the shape you need, and feed the material against the rotation of the cutter (as you would with the Drum Sander attachment). This is the method of operating to use when you are routing an irregular shape.

Alternatively, you can clamp the material to the Powershop table and move the router, via the machine's yoke assembly, to perform the operation in the same way as when sawing (Fig. 66).

Note: Routing with the Powershop, as with all other basic sawing operations and woodworking with the other optional attachments, is extensively covered in another optional DeWalt accessory: The DeWalt Powershop Handbook.

It is packed full of hints on how to get the most out of your machine.

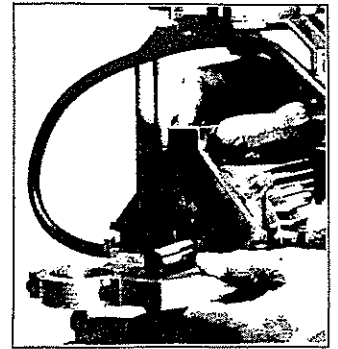


Fig. 59

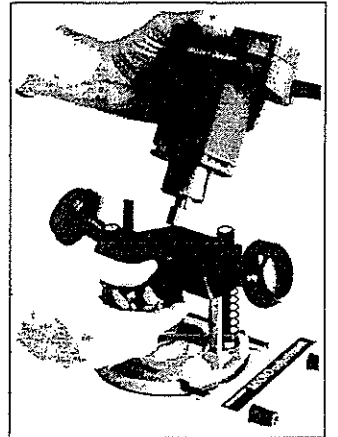


Fig. 60

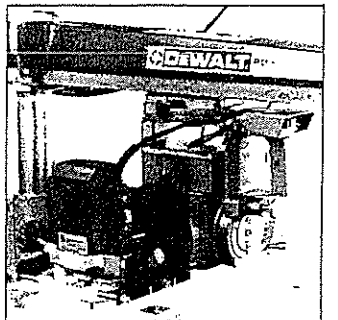


Fig. 63

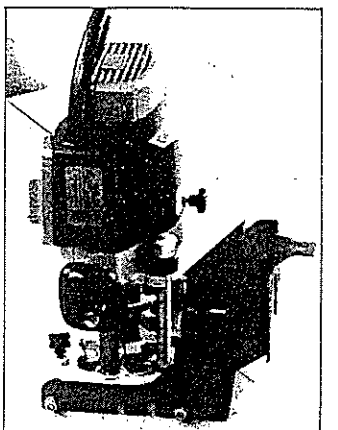


Fig. 64

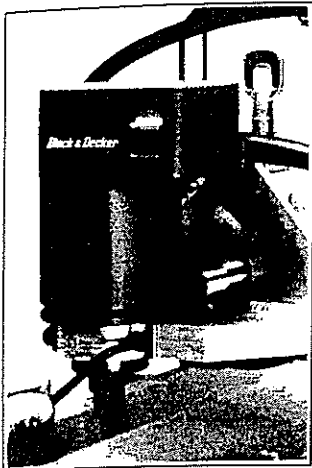


Fig. 61

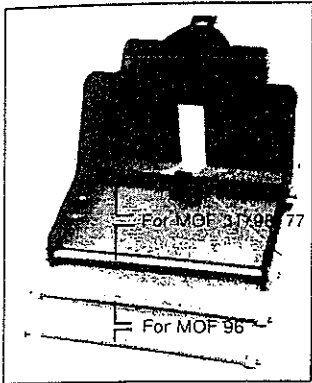


Fig. 62

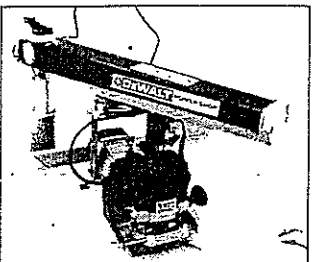


Fig. 65

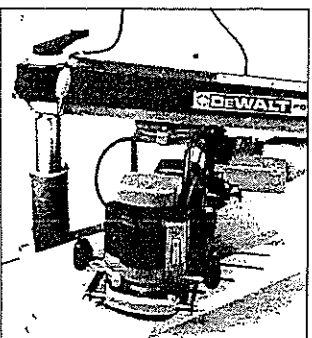


Fig. 66