A21 Reuse of Washing Machine Motors

Washing machine motors can be used to drive other things in the workshop. These motors where made to operate inside an enclosed cabinet and will have live exposed terminals. Guard need to be made to protect live terminals from contact and to prevent entry of water or dust.

Earthing

The motor and the machinery that the motor is mounted in needs to be earth with a green/Yellow or green wire, no smaller than the mains lead earth wire.

Mains Lead Clamping

The mains lead needs to be clamped to the motor or machinery so that when the mains lead is pulled or twisted no force is applied to the connections.

Types of Motors.

Read section F for more details.

Induction Motors

AC induction motors speed is determined by the windings and the main frequency. Most are 1440rpm, some are 2880rpm (for pumps etc.), Some are 2 speed with 1440 and 960rpm.
Some front loader have two speed motors of 2880 rpm (spin speed) and 310 rpm(wash speed) and have power rating of 0.12HP and 0.07HP (not very powerful!!).
There are three types of induction motors:

1. split phase and
2. capacitor run.
3. shaded pole motors

More details is in the table in section F page 1.

Split Phase Motors

See section F6.0. These are the best for other uses as they have good starting torque and reasonable power. Most washing machines have 1/3 or ¼ HP motors, some but not all are reversible, and some have two speeds, but tend to run better on the fast speed. Avoid stalling them on the slow speed as they start on the fast speed and change to the slow speed by internal centrifugal switch when the motor runs. Very old Australian Whirlpool washing machines had ½ HP motors.

These can be used for general workshop use, including concrete mixers, small saws etc.

Capacitor Run Motors

See section F7. These are used in most top loading loading washing machines, Asian and late model Australian washing machines They do not have the starting torque and power of the split phase motors.

These have two sets of run windings, one direct to the power and the other through a capacitor. In the washing machine the motor is switch to run forward and reverse at regular intervals for the agitation.

These have less power and are suitable for “light” duty use. They are generally one speed, but some front loaders have two speed (2880rpm and 310rpm see above).

They are not suitable for a concrete mixer. How ever they are easily reversible.

Shaded pole motors

These are small motor used for drain pumps and fans (in fridges and exhaust fans). They rotate at 2880rpm. See F8 for more details.

Series Motors

These motors have carbon brushes and are used in front loader washing machines, electric drills and other small appliances . Also called universal motors.

When used in a front loader washing machine they have speed of about 15000rpm for the spin cycle(full power) and about 800rpm for wash cycle (reduced power by electronic controller)

Electronic controller limit the power to the motor and reduces the power out put. The controller from the FL washer are not suitable for this use, but they do sense the motor speed and automatically adjust. Jaycar sell electric drill speed controller which should control the speed, but without the speed sensor.

See section F5 for more details. They tend to rotate too fast for most common other uses, but the speed can be controlled using electronic. When they rotate at a slower speed, the power is also reduced.

Inverter Technolgy

See section F11. Not suitable but can be converted into a wind generator. There are a couple of site on the web with instructions. Google *"Wind generator from a Fisher & Paykel"*

Mounting of Round Motors

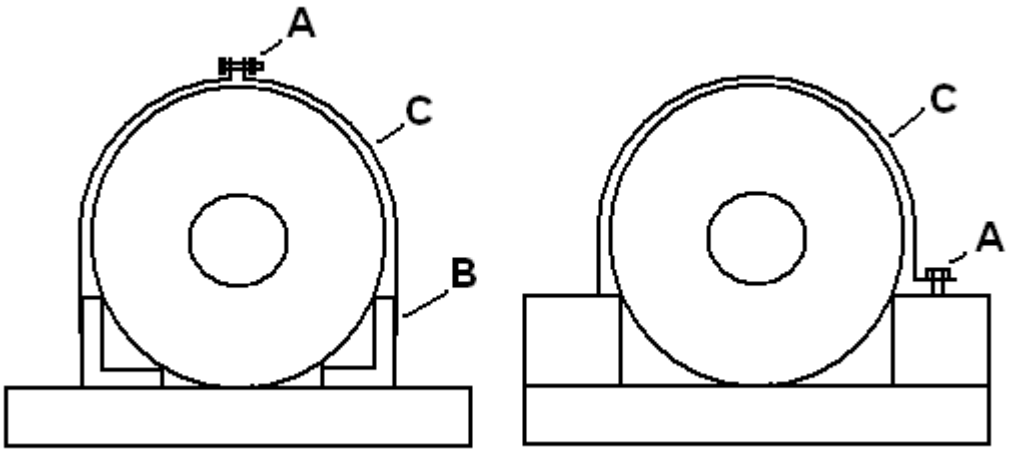

Illustration 1: Suggested Motor Mounting

A wooden or steel frame can be made to hold the motors. "A" is the clamping bolt, "C" is a sheet metal strip (ie builder metal strip with holes) and "B" is angle iron.

Use of Split Phase Motors with faulty start windings

Usually when a motor burns out it is only the start winding that fail. By connecting power only to the run windings only (do not forget to earth the motor) the motor can be made to run by switching on and rotating the motor. These motors can be used for grinding wheels, disc sanders etc. where there is no start up load. Old Simpson motors (see section KD for motor connections) have this problem. **Drilling the hole.** Mount the motor and run it as above. Put a centre drill (lathe operators know what one is.) in a drill chuck and by hand push it onto the end of the rotating shaft. Now do the same with a ¼ inch drill. Next drill and tape for a grub screw on the side of the shaft to hold the sanding disk etc.