

INSTRUCTION BOOK

for

SOUTHERN CROSS GENERATING SETS

Fig. 2752/2753 14Kw. 110 or 240 Volt



THE SOUTHERN CROSS ORGANISATION

QUEENSLAND:

TOOWOOMBA FOUNDRY
PTY., LTD.,
Box 109, P.O., Toowoomba, Q.
Box 393, P.O., Rockhampton, C.Q.
Box 304, P.O., Townsville, N.Q.
Box 115, P.O., Charleville.

VICTORIA:

SOUTHERN CROSS WINDMILLS
& ENGINES PTY., LTD.,
24 Moray Street, South Mel-
bourne, S.C.5.

NEW SOUTH WALES:

SOUTHERN CROSS ENGINE
AND WINDMILL CO. PTY.,
LIMITED,
22 Young Street, Sydney, N.S.W.
32-34 Fitzroy Street, Tamworth,
N.S.W.
70 Frome Street, Mores, N.S.W.

SOUTH AUSTRALIA:

SOUTHERN CROSS
MACHINERY PTY., LTD.,
37 Rann St., Birkenhead, S.A.

WEST AUSTRALIA:

SOUTHERN CROSS WINDMILL
AND ENGINE COMPANY,
LIMITED,
292-4 Railway Terrace, Maylands,
W.A.

SOUTH AFRICA:

SOUTHERN CROSS WINDMILL
& ENGINE CO. (PTY.), LTD.,
50 Henry Street, Bloemfontein,
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SOUTHERN CROSS

14 KW 110/240 VOLT

GENERATING SETS

FIG. No. 2752 TANK COOLED.

FIG. No. 2753 RADIATOR COOLED.

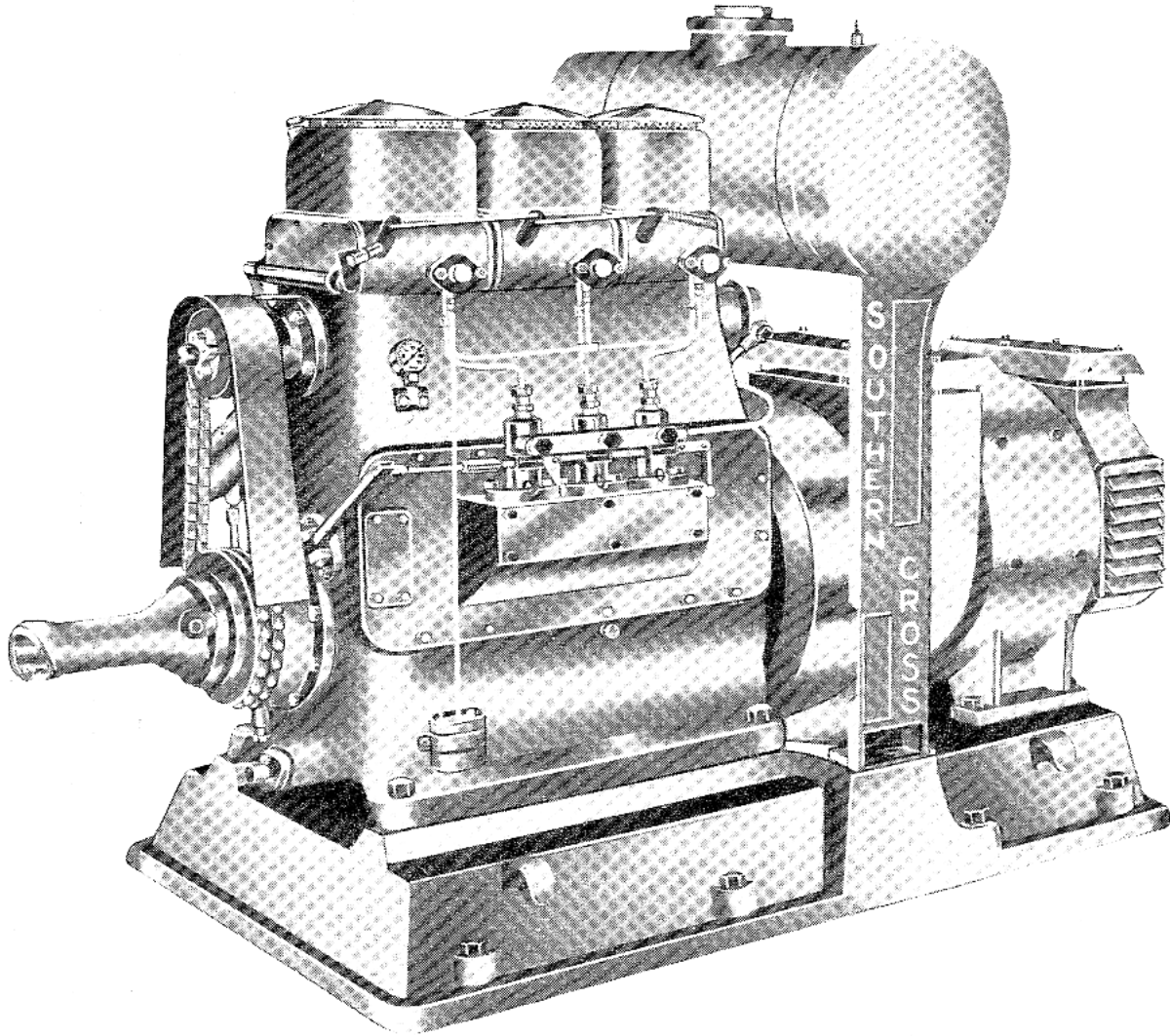


Fig. No. 2752 14KW 110/240 Volt Generating Set.

FOUNDATION.

In order to obtain the best results from this unit it must be set up on an absolutely firm foundation. The most satisfactory foundation is a good block of concrete. The size of the base and shape of the mould is shown on page 2.

TO MAKE CONCRETE BASE.

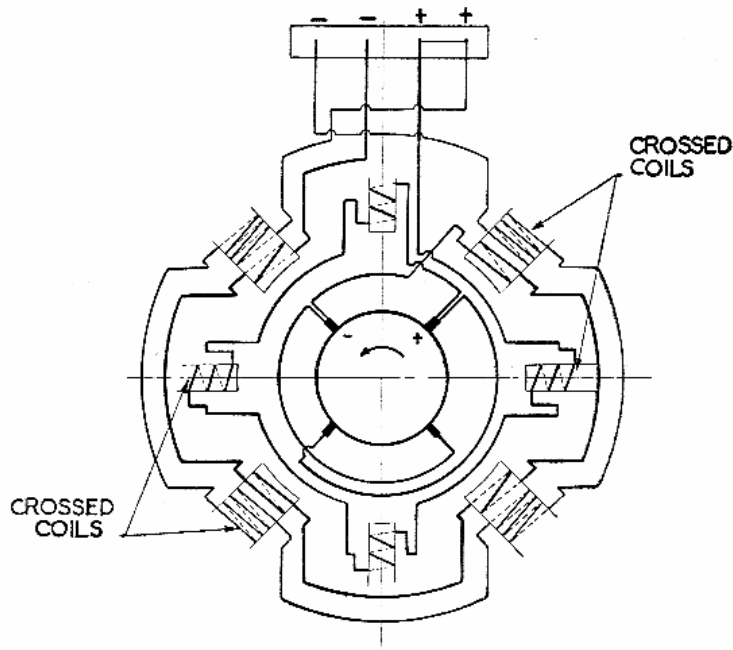
1. Having decided where the Unit is to be installed, sink a hole in the ground 2ft. to 3ft. deep, 4ft. wide and 7ft. 4ins. long.
2. Take the special foundation hole cross boards with the square wooden blocks nailed on to them. Open out the cardboard cartons and tack the cartons to the square block. These cartons make square holes in the concrete to permit grouting the foundation bolts.
3. Set the cross boards over the hole in the positions indicated in the general arrangement, page 2, and see that the cartons are in line, and that the boards are level in both directions.

4. Mix a batch of concrete using 3 parts sand, 4 parts sharp stone or rubble, and 2 parts cement. See that the stone and sand are sharp and clean and do not contain any clay or dirt. If they do, wash carefully before mixing. A block 3ft. deep will require approximately $1\frac{1}{2}$ yards of sand, $1\frac{1}{2}$ yards of sharp stone, and 20 bags of cement.
5. Fill the hole to ground level and at the same time place some old bolts or iron pipe in to act as reinforcement.
6. Allow concrete to set for a day, and, while it is setting, prepare the base for the cooling tank.
7. Next day remove the cross boards which hold the cartons in position and dig the cartons out.
8. Place the foundation bolts with nuts removed in the holes in the block.
9. Lift the Generating Set on to the block by means of two slings under the lugs on the base. To prevent the paint from being marked, put a bag between the engine and the slings.
10. As the engine is lowered on to the block, guide the foundation bolts into the holes in the base and, when the unit is resting on the block, screw the nuts on a full nut.
11. The engine and Generator have been correctly lined up before the unit left the factory. However, the base must be set up true or this alignment is destroyed. Therefore remove the pins and rubber bushes from the flexible coupling. Screw the indicator rod support into the tapped hole in the Flexible Coupling Boss, attach the Indicator Rod to the Support and the Indicator to the Rod.
12. True up the base using wooden wedges under it. The base must be lined up so that the misalignment as shown on the indicator does not exceed .005in. on the diameter of the flywheel, and .010in. on the face of the flywheel. This alignment is most important, and unless care is taken to get it correct the life of the coupling rubbers will be greatly reduced.
13. After the Unit has been correctly aligned, proceed to grout in the bolts with a mixture of two parts clean sand and one of cement. When the holes are filled work the grouting under the base of the unit so it will set on a firm level foundation. This must be very carefully done to prevent the unit getting out of alignment.
14. Next day remove the wedges, tighten the foundation bolts, and check alignment, and, with the same mixture, clean up the surface of the block.
15. On the following day assemble the pegs and rubbers and tighten them very tightly. The engine may now be started, but not before, as it is essential that the block be allowed to set for at least four days before the engine is run.

ELECTRICAL CONNECTIONS.

Arrangements have been made to take the Generator connections from under the commutator end shield cover. 2in. conduit may be fitted to the hole provided.

Terminal connections are shown in the Field Circuit Wiring diagram. A Southern Cross Mark AM-H Universal Rheostat provides variable control of voltage. The remainder of the circuit depends on the requirements of the set.



View from Commutator End.

CARE OF GENERATOR

In order to ensure trouble-free operation of the Generator it is necessary to observe a certain maintenance routine.

CLEANING.

Keep all parts of the generator clean. It is most important that the commutator be kept free from dust and dirt. The commutator, brushes, brush holders and spindles, windings and terminals should be periodically wiped down with a clean dry rag.

BEARINGS.

When the Generator leaves the works the bearings are packed with grease and do not require further attention before the plant is put into operation.

However, it is advisable to remove the end caps from the bearings at least once a year to examine them. The balls and races should be clean and show no signs of rusting. There need only be a smear of grease on the bearing. If necessary, grease should be added to the bearing. Only fill the bearing cage, don't fill the cap with grease.

The faults arising from over-lubrication are far greater than those occurring from under lubrication. Under no condition must oil or grease containing graphite be used.

Recommended Greases Are:—

- SKF. No. 28 Grease.
- Shell RB Grease.
- Shell No. 2 Fibre.
- Gargoyle No. 3 Grease.

COMMUTATOR.

Keep the Commutator clean and bright. Do not allow copper or carbon dust to collect on the insulation between the bars, nor about the junction of the armature windings with the bars.

BRUSHES.

Keep the brushes free in their holders and all even in pressure. When worn down to less than 5/8in. long they should be replaced with new brushes of the size and grade stamped on the name plate.

TO FIT NEW BRUSHES.

The brush rocker is set in the neutral position, and this position is marked with white paint.

It may be loosened by slackening off the clamp screw and loosening off the commutator End Bearing Cap.

This permits the Brush Rocker to swivel around to expose each Brush Holder.

Remove the old brushes and try the new brushes of the size and grade stamped on the name plate in the Brush Holder.

They should slide freely without sticking. If they are tight ease them down carefully by rubbing the tight side lightly on a flat sheet of fine sandpaper until they will just slide in the holder.

With the new brushes in position, bed them on the commutator or sliprings with a piece of sand paper between the brush and the commutator.

Draw the paper backwards and forwards until the brushes assume the correct curvature, and be careful to keep it around the commutator so that a flat is not formed on the brush. When the process is nearly completed, fine glass paper should be used to obtain a very smooth finish.

After bedding, carefully clean away every trace of dust from the commutator, brushes and holders. Make sure no specks of abrasive material are embedded in the Face of the Brush.

Reassemble and shift Brush Rocker to correct position and retighten screws.

The generator may be started up again, but it is advisable to run it on light load for a few hours before putting on full load to enable the brushes to settle down properly.

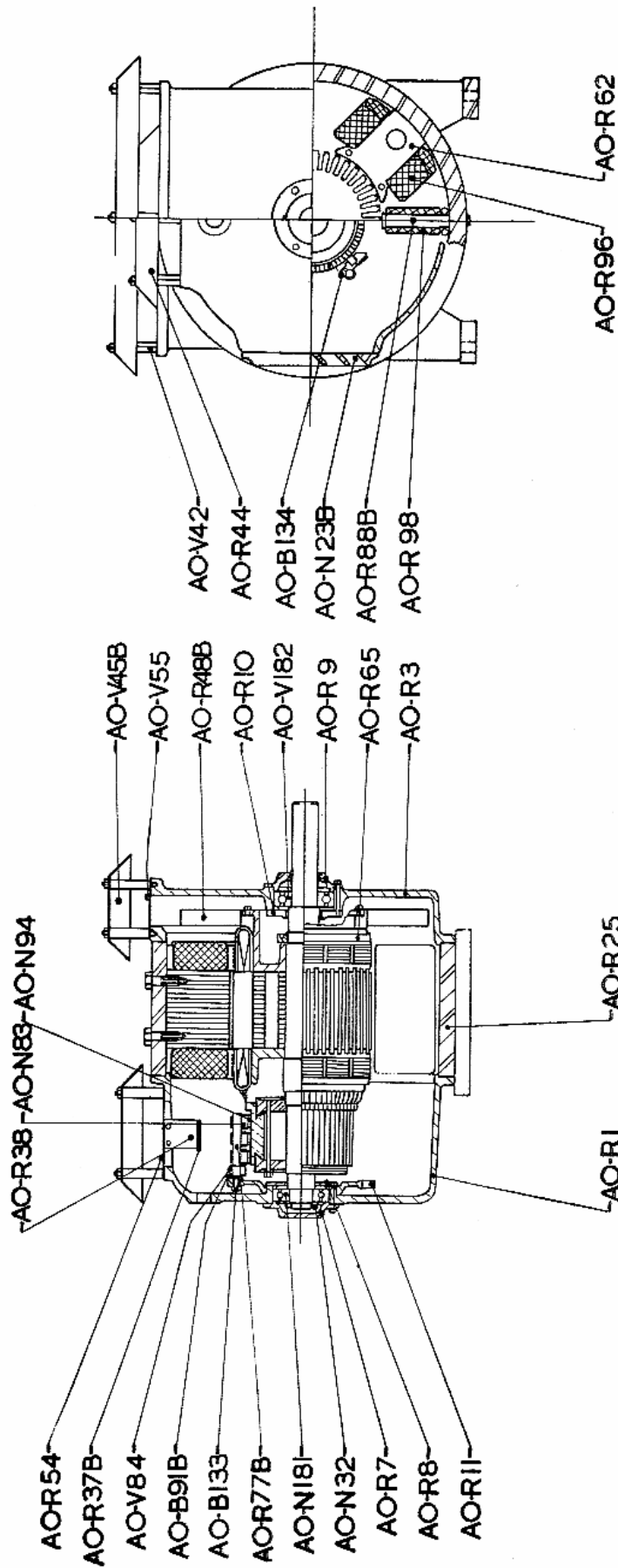
SPARKING AT BRUSHES.

The commutator must be examined occasionally while the plant is running. It should be practically sparkless at all times. If sparking does occur steps should be taken immediately to cure it or serious trouble may arise in a short time.

The sparking may be due to several causes:—

- (1) Brush rocker not in neutral position (check markings).
- (2) Overloading of Generator.
- (3) Jumping of brushes due to vibration or incorrect pressure on the Brush Tension Arm.

When the Generator is supplied the tension of the brush is correct with the spring in the lowest notch of the Tension Arm, and as the Brush wears it is necessary to place it in a notch further back.



Mark AO-R and AO-S 14KW 110 and 240 Volt Generator—Sectional View.

Southern Cross Generating Sets—PARTS LIST.

COMMON PARTS FOR MARK AO-R/AO-S 14 KW. 110/240 VOLT GENERATOR.

No. Off	Sym. No.	Name of Part.	No. Off	Sym. No.	Name of Part.
1	AO-R 1	Commutator End End Shield.	4	AO-V 84	Brush Rod Cable Clamp.
1	3	Drive End End Shield.	4	AO-R 88B	Interpole.
1	7	Commutator End Bearing Cap—Outside.	8	AO-B 91B	Brush Spindle Insulating Washer.
1	8	Commutator End Bearing Cap—Inside.	12	AO-N 94	Brush.
1	9	Drive End Bearing Cap—Outside.	20	AO-R100	Main Pole Shim.
1	10	Drive End Bearing Cap—Inside.	20	101	Interpole Shim.
1	11	Brush Rocker.	4	AO-B133	Brush Holder Spindle Nut.
2	AO-N 23B	End Shield Inspection Plate.	12	134	Brush Holder Clamp Screw.
1	AO-R 25	Generator Body.	4	145	Rocker Spindle Washer.
1	AO-N 32	Commutator End Bearing Nut.	1	AO-N181	Commutator End Bearing.
1	AO-R 37B	Terminal Strip.	1	AO-V182	Drive End Bearing.
2	38	Bracket for Terminal Strip.	3	AO-R183	Series Coil Connection Strip.
12	AO-V 42	Drip Cowl Studs and Distance Piece.	3	185	Interpole Coil Connection Strip.
1	AO-R 44	Commutator End Drip Cowl.	3	AO-T186	Shunt Coil Connection.
1	AO-V 45B	Drive End Drip Cowl.	2	AO-R187	Inter Brush Connection.
1	AO-R 48B	Fan.	1	188	Series to Negative Terminal Connection.
1	54	Commutator End Screen.	1	189	Series to Negative Brush Connection.
1	AO-V 55	Drive End Screen.	1	190	Interpole to Positive Terminal Connection.
4	AO-R 62	Field Pole.	1	191	Interpole to Positive Brush Connection.
4	77B	Brush Holder Spindle.			
12	AO-N 83	Brush Holder.			

EXTRA PARTS FOR MARK AO-R 14 KW. 110 VOLT GENERATOR.

No. Off	Sym. No.	Name of Part.	No. Off	Sym. No.	Name of Part.
1	AO-R 65	Armature.	2	AO-R 97	Interpole Coil—Straight.
2	95	Field Pole Coil—Straight.	2	98	Interpole Coil—Crossed.
2	96	Field Pole Coil—Crossed.			

EXTRA PARTS FOR MARK AO-S 14 KW. 240 VOLT GENERATOR.

No. Off	Sym. No.	Name of Part.	No. Off	Sym. No.	Name of Part.
1	AO-S 65	Armature.	2	AO-S 97	Interpole Coil—Straight.
2	95	Field Pole Coil—Straight.	2	98	Interpole Coil—Crossed.
2	96	Field Pole Coil—Crossed.			

MARK BO-Q BASE AND FITTINGS.

No. Off	Sym. No.	Name of Part.	No. Off	Sym. No.	Name of Part.
1	BO-Q 1	Base for Engine and Generator.	4	AW-D160	Engine and Generator Dowel.

NOTE.—For Parts of Engines, refer to Separate Engine Instruction Book.