D U N L I T E

28 ORSMOND ST.

HINDMARSH, S.A. 5007.

TYPE F.55

WIND DRIVEN GENERATOR

D.C. BRUSHLESS 5KW.

FOR 110V. D.C. OPERATION

INSTALLATION & OPERATING INSTRUCTIONS.

CONTENTS

SECTION A - GENERAL DESCRIPTION

Tower Cap:

The 5KW. wind driven generator uses a tower cap that is attached to a length of 15.0cm. dia. steel tubing. Standard configurations where the tower cap couples directly to the 3 legs of the tower should not be used, as there is insufficient clearance between the blades and the tower. The four studs correspond to the holes provided in the base of the turntable assembly and the nuts provide a means of levelling the turntable.

Generator:

Is of the brushless design, being a three phase, multipolar alternator, with silicon full wave rectifying diodes to give a steady D.C. output with minimum ripple factor. Totally enclosed construction, tropic proofed windings. 5 : 1 ratio gear box, with helical cut gears running in oil bath. (" MOBILGREASE" 3L or equivalent)

Performance Specifications:

a)	Maximum continuous output (CMR)	5KW.
b)	Maximum excitation power	120 watts (self excited)
c)	Cut-in wind verocity	13 KM/H
d)	Maximum output wind velocity	35 KM/H
e)	Maximum output voltage	130 volts.

Head Assembly (Turntable):

The turntable assembly into which the generator is seated, rotates on sealed, heavy duty grease packed bearings. The centre shaft, enclosed in the turntable, carries the 3 slipring assembly to transfer the generated current and for connection of field control. These rings terminate at a weather shrouded terminal strip at the base of the turntable.

SECTION A (cont.)

Propeller:

This consists of an aluminium hub assembly containing the sliding governor, the oscillation of which is smoothed out by a shock absorber unit. The 3 blades are mounted on shafts, which rotate on bearings fitted in the hub assembly. These shafts act in unison, under the combined forces of wind and speed on the blades, to move the governor assembly in and out against the action of a central spring and the shock absorber unit, providing automatic "feathering" of the blades and so prevent excessive generator speeds and strain on the tower.

The electronic voltage regulator, mounted inside the cubicle, has 2 functions:

a) Limiting the maximum output voltage so that storage batteries are not over charged. The potentiometer controlling this level is mounted on the front panel. It has been factory set to limit the maximum voltage to 2.35 volts per cell (129 volts for 55 cells.) Normally no adjustment of this control is necessary.

b) Limiting the maximum output power. In high wind conditions (above 35 kph) the regulator will limit the maximum power output to 5 KW. to prevent damage to the generator. A factory set control determines this level. Any attempt to change this control not only voids the warranty but may destroy the generator.

Note:- if the storage batteries are fully charged the regulator will prevent any further charging irrespective of wind conditions.

Voltage Regulator:

"DUNLITE" control cubicle, fitted with centre zero amperemeter to register charge and/or discharge current, and voltmeter.

SECTION A (cont.)

Packed Weights:

Generator case	82 x 52 x 57 c.m.	155 kg.
Turntable Assembly, Propeller hub, tower cap, control cubicle & tail wings	121 x 63 x 48 c.m.	91 kg.
Propeller blades, tail bone and suspension	373 x 37 x 37 c.m.	106 kg.

SECTION B.

PLANT LOCATION

Examine the proposed site to make sure that the plant will receive the maximum force of the prevailing winds for the particular area.

Most of the criticism of unsatisfactory operation of a wind driven plant is due to their installation in unsuitable positions or low towers.

Maximum efficiency is only possible where the plant operates in a clear and steady airstream.

It is essential that the plant is at least 5 - 7 metres clear of all obstacles (buildings, trees, etc.) and the tower is of sufficient height to reduce ground disturbance - a minimum of 12 metres is recommended.

Make sure that plant is placed between the direction of prevailing winds and any building etc. Any object higher than the plant will cause a disturbance in air flow for approximately 300 metres in front of the plant, and 50 - 100 metres if behind the plant.

In hilly areas it is better to place the plant 200 - 300 metres away from the building housing batteries and control equipment, if better wind condition is thus obtained.

The steadier the air flow in which the plant is operating, the higher the average output, and the less strain is placed on the plant due to frequent changes in wind direction.

SECTION C

PLANT INSTALLATION

The top of the tower is capped by fitting the fabricated steel tower cap, which has four mounting studs, positioned to suit the four holes in the base of the head assembly (or turntable).

Turntable

To fit the turntable assembly to the tower cap, the "UNBRAKO" type 5/8" BSW nuts and flat washers are removed, and the turntable lowered into position over the studs, positioning it so that the terminal strip at the base is most conveniently placed to run cables down the tower.

Fit the push rod (Item 91) down through the centre hole of the turntable spindle, making sure the bushing is fitted correctly in the rear pivot arm casting (Item 81).

The head body clamps used to secure the generator in position in the turntable are released and opened out to allow the generator to be placed in the turntable recess, with the gear box hanging vertically downwards.

Generator:

Some form of lifting clamp, or sling, is attached to the generator and used in conjunction with block and tackle equipment to hoist the generator into position over the turntable and then lower into recess.

The two sets of head body clamps are then repositioned over the generator and securely tightened, after which the lifting clamp may be removed. The plastic cap on the breather pipe on the top of the gear box should be removed. It should be retained at the installation site and conspicuously tagged, as it should be refitted in place should the generator be removed, to prevent oil leakage from the gear box in transit.

(When lifting the turntable, generator, tail assembly or components of the propeller, it is suggested that they each be lifted on the ladder side of the tower to reduce the possibility of catching in the tower, and guided by means of attached guide ropes.)

SECTION C (cont.)

Levelling Turntable

With the generator in position, levelling of the turntable must be carried out prior to fitting the tail assembly. This is to ensure the generator has no bias to a particular position. The nuts of the anchoring "A" stud are securely locked against each side of tower cap, to the 40 Nm. torque recommended. By adjusting the holding nuts on the adjusting studs "B", "C" & "D" with the "UNBRAKO" nuts slackened off, the level of the turntable is adjusted until the generator will remain in any position.

Check that ALL the holding nuts bear against the underside of the turntable base before tightening the lock nuts up against the holding nuts. Finally, tighten down the "UNBRAKO" self locking nuts.

If the machine cannot be levelled, select the lowest lug bolt as the "A" anchor stud and repeat the above procedure.

Tail Assembly

It is necessary to first assemble tail wings and angles and to bolt them to tail bone.

The angle irons of tail are placed across the tail wings with the flat side of angle iron out, and are then bolted with $\frac{1}{4}$ inch galvanised bolts, after placing a galvanised washer between the wing and angle iron on each bolt. These washers prevent the wings from vibrating against angle irons. The tail bone is then fitted into the socket provided in the turntable, making sure the anchor set screw will seat into its recess in the pipe. Bolt the two side arms of the tail assembly to the turntable using 2 5/16" bolts provided.

Finally, securely clamp the tail bone with the set screw and lock, then tighten the two side arm bolts.

SECTION D

PROPELLER

The variable pitch propeller fitted to the plant has been carefully balanced and aligned at the factory and the hub and blades should be carefully examined to see that they have not been damaged in transit.

The main centre casting of the propeller should be fitted to the brake casting, after making certain that the machined surfaces are perfectly clean. Then tighten the three holding set screws EVENLY and SECURELY. (Torque reading of 47 - 55 Nm.). All the blade arms should be then smeared with silicon grease to inhibit corrosion and then the blades can be fitted to the hub. Check that the blades and the hub each have the same serial number and be certain that No.1 blade is fitted to No.1 shaft, and so on. Fitting the wrong blade to the wrong hub or shaft will cause the propeller to be out of balance and create vibration.

The governor balance weights are also numbered. When the blades are fitted, the governor balance weights should be bolted to the blade and TIGHTENED SECURELY. (Torque reading of 27 - 34 Nm). Then tighten 5/16" bolt on the side of clamp to 23 Nm.

Check that the shock absorber gland nuts are tight.

The cylinders are filled with Viscostatic 10/30 grade oil. Each, under 5 kg. load, travels 5 cm. in approximately 3 seconds. The shock absorber system is provided to dampen out oscillations which may occur under conditions of light load and particular wind conditions.

Before allowing propeller to run, move governor weights to the fully feathered position and rotate propeller to see that there is ample clearance from the tower in this position. The propeller is so designed that when the maximum desired speed is reached the centrifugal action of the three governor weights overcome the tension of the centre spring and move the blades to a coarser pitch, thus tending to slow the propeller.

The movement of the sliding governor is restricted to provide a maximum of 80^{o} feathering. This amount of movement can be reduced, if desired, by loosening the half nuts (Item No.4 - Drawing No. 3549) and moving inwards along the threaded centre shaft, reducing the preset distance of 57 mm. measured from the front of the sliding governor to the nearest face of the half nuts.

As the wind pressure decreases, the speed will tend to slow and thus reducing the centrifugal force on the weights and the spring will return the blade to the maximum speed position. Thus it will be seen that the propeller operates as a fixed unit until th maximum speed is reached.

SECTION E

BRAKING SYSTEM.

Fitting (See Drawing 0352-W-16)

The brake system used on the Model F55 wind plant consists of a mechanically operated PBR DB1100 disc brake caliper assembly (Item 27) operating onto achrome plated cast iron disc (Item 23) which is fitted to the gearbox layshaft. All of these items are fitted to the generator prior to its mounting on the turntable.

Once the generator is securely fitted to the turntable the operating cable (Item 32) should be fitted in place. Using one of the "D" shackles supplied connect it to the adjustment link (Item 90). Undo the lock-nuts on the adjustment link and release all adjustment. Remove the "D" shackle from the other end of the cable and pass the cable through the pulley (Item 26) and connect it to the lever arm (Item 89) using the "D" shackle.

ADJUSTMENT.

For efficient operation of both the brake and the wind plant the correct adjustment of the braking system is essential. If the brake is over adjusted then it will cause drag and the wind plant will require higher wind speeds to operate and if under adjusted will not stop the plant properly.

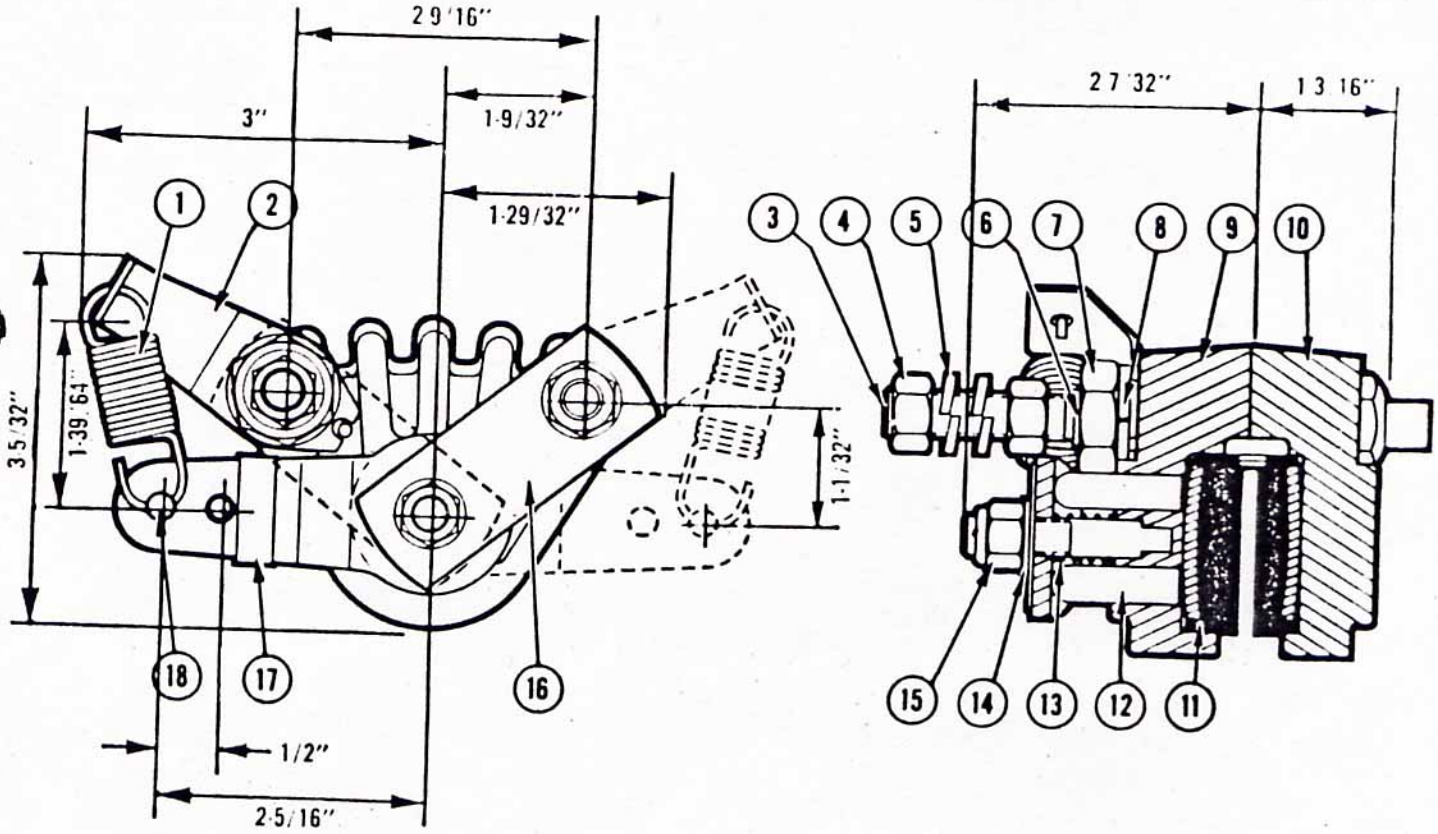
CALIPER ADJUSTMENT (See Fig. 1)

By turning nut (Item 15) release all adjustment on the disc pads (Item 11). Using the adjustment nuts(Item 4) on the two mounting rods (Item 3) position the caliper so that the disc is centrally located between the two disc pads. The wind plant should now be able to turn freely without any drag on the brake.

Now adjust the disc pads by turning the adjustment nut (Item 15) until the pad makes contact with the disc. When this occurs back off the adjustment until the disc is just free to move without drag.

The brake is now fully adjusted and all that is required is to take-up any slack in the operating cable. To accomplish this adjust the nuts on the adjustment link (Item 90) on Drawing No.0352-W-16 until the slack is removed, but do not overtighten as this will tend to operate the caliper.

PARTS LISTING AND DIMENSIONAL DATA



Ref. No.	Part No.	Description	Qty.
1	DB2059	Return Spring	1
2	DB2060	Bracket	1
3	DB2058	Mounting Rod	2
4	COMM.	Nut, Hex. 3/8" x 24 UNF	4
5	COMM.	Spring Lock Washer, 3/8"	4
6	DB2057	Sleeve	2
7	COMM	Hex. Lock Nut, 9/16" x 18 UNF	2
8	COMM.	Spring Lock Washer, 9/16"	2
9	DB2046	Body, Caliper Operating, including Stud DB2048	1

PDK-2, Friction Pad Kit.

Ref. No.	Part No.	Description	Qty
10	DB2047	Body	1
11	DB2051	Disc Brake Pad Assembly	2
12	DB2052	Operating Pin	2
13	DB2054	Spring	1
14	COMM.	Plain Washer, 5/16"	1
15	COMM.	Nyloc Nut, 5/16" x 24 UNF	1
16	DB2086	Shim	1
17	DB2053	Operating Arm	1
18	COMM.	Clevis Pin, 1/4 Diam x 5/8"	1

Fig. 1

SECTION E (cont.)

BRAKE SYSTEM (cont.)

BRAKE LEVER ADJUSTMENT (See Drawing 0352-W-16)

Use a heavy, galvanised wire to connect the bottom end of the pullout rod (Item 91) to the pullout lever (Item 92) which is hinged between the pullout clamp (Item 93) secured to one of the tower legs, and positioned so that with the lever down and held under tension with the pin (Item 98) inserted, the brake prevents the wind plant from rotating.

Final adjustment of this cannot be made until the propeller is fitted.

(This adjustment needs to be rechecked after 3 - 4 weeks, when the brake lining has bedded, and then at six monthly intervals.)

Retensioning is done by loosening the pullout clamps and sliding down the tower leg and retightening.

SECTION F

CONNECTION OF PLANT & CUBICLE

PLANT

The main generator output leads and control lead are brought out of the generator per flexible conduit and after the generator is fitted to the turntable, these leads are connected to the appropriate terminals on the protected connection strip at the base of the turntable, the conduit being anchored after connection.

Cable coloured	RED	-	POSITIVE
	BLACK	-	NEGATIVE
	GREY	-	FIELD (Control lead)

It is suggested that the main generator cables and the field cable interconnecting the plant to the control cubicle are brought down the full length of the tower in plastic or seamless steel conduit, or water piping which can be buried in the ground for the distance between the base of the tower and the building housing the other equipment and batteries. Alternatively, the cables can be brought down to a cross arm fitted with insulators, and taken from this point by aerial cables to a similar set of insulators on the building. The selection of cable sizes, particularly with regard to the main output leads, must bear in mind voltage drop associated with maximum charging currents at the low voltage pertaining to these installations.

CONTROL CUBICLE

The meterised control cubicle should be mounted as close as possible to the batteries, thus reducing the length of cable runs and possible voltage drop, as well as possible electrical interference with telephonic circuits.

Conduit entries are provided at the bottom of the cubicle and a heavy duty terminal strip is accessible by opening of the hinged door.

SECTION G

OPERATION OF THE GENERATOR

The basic design and performance figures have been detailed in the GENERAL DESCRIPTION - SECTION A.

When the generator begins rotating, a voltage due to the residual magnetic flux, will be generated.

The 110V. rectified supply is applied to the exciter field via the voltage regulator unit which controls the amount of current fed into the field. This takes the form of rapidly switched pulses, which supply just sufficient average current to maintain the generator output voltage at the desired level.

This current ranges from 150 - 300 mA, no load to full load, and varies from cold to hot operating conditions.

SECTION H.

SYSTEM OPERATION (110 V.)

The design of plant and tower is calculated to withstand gales up to 150 km/H.

The combination of mechanical latch and shock absorber system has proved capable of handling any oscillation which might occur, with batteries or load connected.

The required setting of the potentiometer to secure correct regulator operation for the site conditions is obtained by switching the regulator OFF so that maximum charge rate is available to "boost" charge the batteries. This condition should be allowed to continue until all cells gas freely with very fine bubble (milky electrolyte above plates), all cell voltages rise to 2.8 V. and specific gravity is 1250^{+} 5 points (temperature corrected). Then switch regulator ON again. Adjust the potentiometer so that under conditions of maximum wind velocity, charge rate is reduced to approximately 2 - 3 amps.

Due to variations of voltage drop dependent on lengths of cable runs, and differences in internal resistances of batteries, it is not possible to factory set regulators accurately.

(If no wind power is available, initial charging of the batteries would require the use of a portable charging set.)

BOOST CHARGING

Battery manufacturers usually recommend boost charging storage batteries about 4 times per year. This operation increases significantly, battery life particularly if the charge discharge cycle is shallow. Procedures do vary depending on the battery manufacturer. Contact the supplier to find the correct boost charging parameters for your batteries.

BOOST CHARGING PROCEDURE

Choose a day with strong winds and switch the boost switch on the regulator PCB to the Boost position. This will bypass the voltage sense yet retain the current limit function. With no load on the batteries, allow the unit to continue to boost charge until the battery voltage is 143 volts (or the manufacturers recommendation).

This may take several hours, depending on wind conditions. Once boost charging has finished, switch the switch back to the normal position.

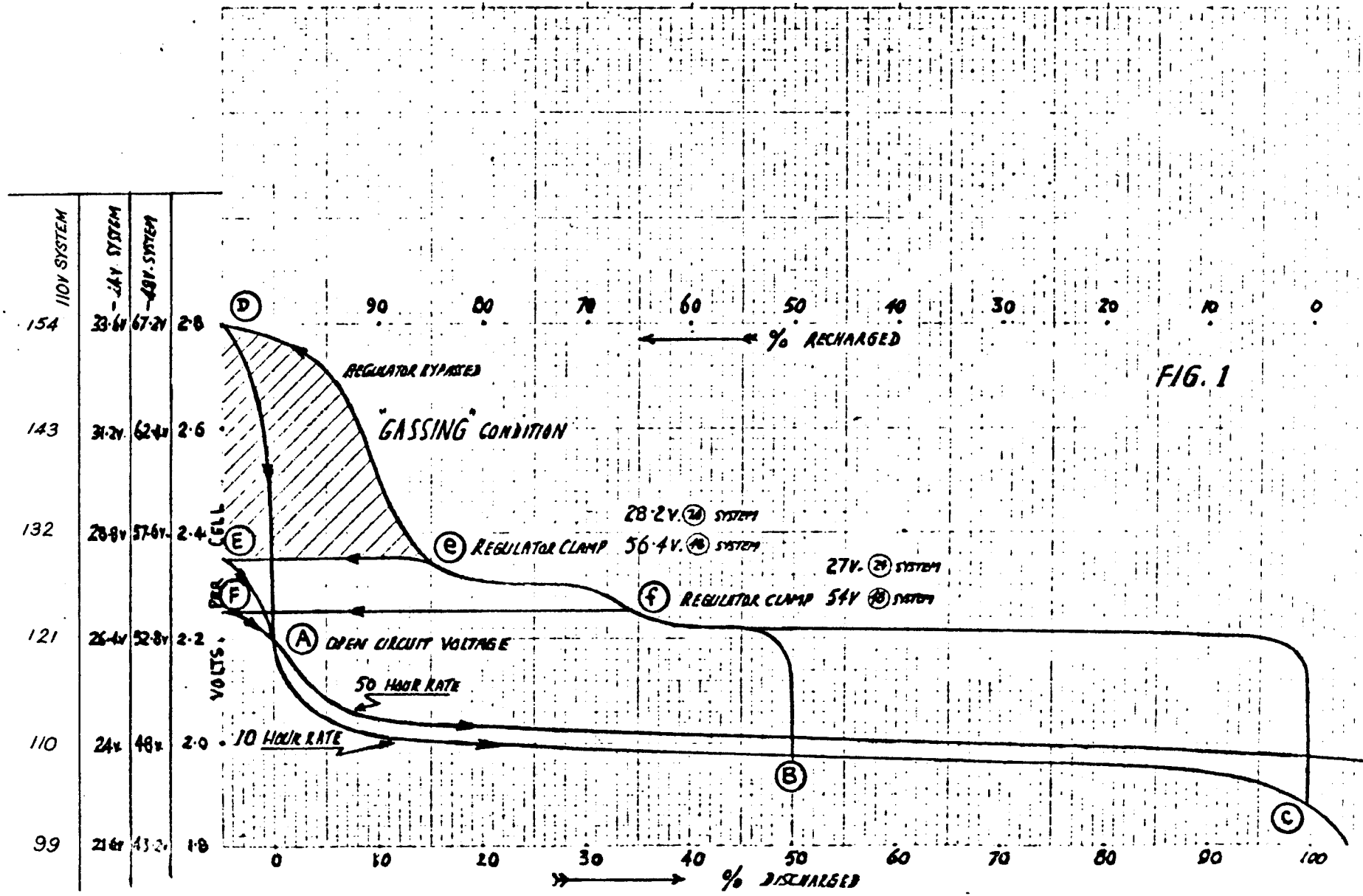

110V SYSTEM
24V SYSTEM
48V SYSTEM
154
143
132
121
110
99
33·6V
31·2V
28·8V
26·4V
24V
21·6V
67·2V
62·4V
57·6V
52·8V
48V
43·2V
2·8
2·6
2·4
2·2
2·0
1·8
VOLTS PER CELL
90
80
70
60
50
40
30
20
10
0
% RECHARGED
REGULATOR BYPASSED
"GASSING" CONDITION
28·2V. (24) SYSTEM
56·4V. (48) SYSTEM
REGULATOR CLAMP
27V. (24) SYSTEM
54V (48) SYSTEM
REGULATOR CLAMP
OPEN CIRCUIT VOLTAGE
50 HOUR RATE
10 HOUR RATE
D
E
e
F
f
A
B
C
0
10
20
30
40
50
60
70
80
90
100
% DISCHARGED

FIG. 1

Battery Cycle (Refer Fig. 1)

In practice, as the station load varies, and if insufficient wind power is available to sustain it, the rate of discharge and the battery voltage varies following a voltage curve (A) to (C) Fig. 1.

Other factors also influence the voltage. From the fully discharged state the battery voltage would follow the curve C,f,e,D if charged at the 10 hour rate, requiring about 14 hours to reach point D as the last 10% of charge has to be completed at the 20 hour rate to avoid violent gassing (electrolysis of water of the electrolyte).

From the 50% discharged state the voltage would follow the curve B,f,e,D when charged at the 10 hour rate.

Clamping the generator voltage at 2.35 volts per cell results in a recharge curve C or B,f,F.

In the latter two circumstances, the current, in excess of the station load, which flows into the battery, will taper off to a very low value and the last 10% of recharge capacity may take 20 hours in the former case (2.35V. clamp) and 100 hours in the latter case, to complete.

Provided the voltage is clamped at or below 2.35 volts per cell (129.25 or 124.0 V. for a 24 cell battery) there will be no appreciable "gassing" and consumption of water from the electrolyte minimised. Twelve monthly "top up" is then feasable except for the pilot cell which should receive a few drops of water each visit to maintain electrolyte at the top level line for more accurate S.G. readings. From day to day the voltage will vary within the area, A, B, f, F, A for 124 volt clamp and A,B,f,e,E,A for 56.4 V. (110V. system).

At the termination of the charge, after the battery has been fully recharged, the battery voltage will fall from D, E or F, as the case may be, to A (the true open current voltage of the battery); this may take several hours. If, however, a station load exists on the battery, the time taken to reach point A may only be minutes and depends on the value of the load; voltage continues (at a decelerating rate) to fall and stabilises at about 2.0 volts per cell. There is then a progressive slow fall in voltage until near the end of discharge, when the voltage falls rapidly to 1.85 volts and lower, at an accelerating rate.

Note that when the station load is very small, the discharge voltage may not fall as low as 1.85 V. before the battery is damaged by over discharge, and the total ampere hours consumed must never exceed the nominal 10 hour rate capacity. If it is desired to determine the state of charge under these circumstances, an artificial load equal to the 10 hour rate discharge current should be applied, and cell voltages can be read after 1 minutes; curves A-B-C then apply.

SECTION H

WIND DRIVEN GENERATOR OPERATION

When no wind blows, the battery voltage will fall within minutes to 110 V. or less depending on load conditions; the governor is now holding the blades at the pitch angle for maximum efficiency in the speed range of 180 - 200 r.p.m.; the voltage regulator (energised from the battery) will be switched on and when the wind blows the mill will accelerate to approximately 200 r.p.m. Excitation commences at about 180 r.p.m.

Because of the fluxing delay due to the inductance of the exciter and main alternators fields, the mill will continue to accelerate while the flux is building up; thus the mill may reach 180 r.p.m. before the machine delivers current to the battery. Maximum output is obtained at about 200 r.p.m. With the build up of output current, the dynamic load on the mill increases with wind velocity. At 20 k.m.h. the mill speed would be about 200 r.p.m. and nett output 750 watts. The mill is operating with fixed pitch blades, and as the wind speed varies the output follows a curve similar to A-C which curve (c) also indicates approximate mill r.p.m. This condition remains unless -

1) The mill 200 r.p.m.

2) The battery voltage rises above the pre-set voltage of the regulator.

In case 1), the weights move out slowly, to feather the propeller blades.

In case 2), the voltage regulator blocks off excitation and the mill r.p.m. increases ultimately to the full feathered position between 200 and 220 r.p.m.

It should be noted that for all wind speeds greater than 12 k.p.h. the mill will rotate at approximately 200 r.p.m. This does not indicate that the full power of the unit is available, the output power depends on wind speed and is not closely related to the mill speed.

SECTION I

REGULAR INSPECTION OF MACHINES IN THE FIELD.

MAINTENANCE ROUTINES.

1.1.0 Staff visiting wind driven generator sites should carefully scrutinise machines from the ground for obvious defects. If possible the mast should be scaled at around three monthly intervals for a close inspection of the following points:-

1.1.1 Apply brake to prevent the propeller rotating, and check that position of pullout lever and pin is correct to achieve this result - adjust if necessary.

1.1.2 Examine the tower and wind driven generator generally for signs of loose bolts or fittings. Also evidence of damage or deterioration, especially corrosion or rusting. (This can be stopped by application of suitable anti-rust or sealing compounds.)

1.1.3 Grasp the tower cap firmly and use body weight to shake the tower and machine. Lack of tower springiness may indicate slack tower bolts. A significant relative movement between the fixed and rotating portions of the head base assembly may indicate a damaged bearing or broken shaft. The head base rotates on a 2" ball bearing and general stability should be appropriate to this class of bearing.

1.1.4 Check the tail for general movement, particularly the pipe where it sockets into the head base anchoring points. Telltale rust stains emanating from these points may be an indication of a slack fitting. The set screw on the tail-pipe socket should seat solidly on the inside bottom of the pipe.

1.1.5 Check cables and terminals (generator to turntable main leads from turntable.).

Remove pickup brush plate assembly to check condition of brushes, sliprings and brush tension.

Check U-bolts securing generator in turntable are tight.

Examine all bolts, nuts, etc. for signs of corrosion.

SECTION I (cont.)

MAINTENANCE ROUTINES (cont.)

1.1.6 Carefully examine each mill blade in turn, paying particular attention to both faces of each blade about 12 to 15 inches out from the governor balance weight for signs of fatigue cracking. These blades can flex considerably in adverse weather conditions.

1.1.7 Examine the 3 blade shafts at the base of the taper section for signs of fatigue cracks. Some moderate stressing of the blades by hand may help to reveal such damage.

1.1.8 Grasp each governor balance weight in turn and determine how much free movement there is in each blade. If this movement is more than about 5 mm. at the trailing edge of the blade, it could indicate a worn or damaged nylon roller in the feathering mechanism. Failure of the nylon rollers can be initiated in some cases by misadjustment of the feathering angle limit nut on the center shaft. If this is not properly adjusted to give around 80^{o} feathering, the nylon rollers can be pounded against a part of the governor casting to cause distortion and eventual failure. 80^{o} feathering is equal to approximately 51 mm. between the limiting nut and the sliding governor in the unfeathered condition.

1.1.9 Remove the nose cone and examine the centre shaft and both damper shafts for signs of binding. Fully feather the blades by pulling on a governor bobweight. A continuing resistance will be felt as the blades move to the fully feathered position under the control of the governor spring and the hydraulic dampers. Feathering should be limited to approximately 80^{o} by the feathering limit nuts. If not, check the nylon rollers for flat spots and adjust the sliding governor travel limit to 57 mm. release the bobweight and allow the blades to restore to the unfeathered position. Allow about 3 seconds for full restoration. If restoration is nearly instantaneous or jerky, look for leaky, dry or mis-aligned hydraulic dampers. Spray the 3 sliding shafts as required with "Molybond HE50" spray to ensure proper lubrication.

SECTION I (cont.)

MAINTENANCE ROUTINES (cont.)

1.1.10 The brake mechanism should be inspected for a serviceable brake-band and proper adjustment of the lever system. With the brake fully applied, none of the components of the leverage system, i.e., rods, etc., should be near "bottoming". Refer to page 9 for further information on brake adjustment. Oil linkages.

1.1.11 Allow the machine to run. Gear noise is quite normal but it should be even and dependant largely on load. Experience can be the only means of determining if the noise is excessive.

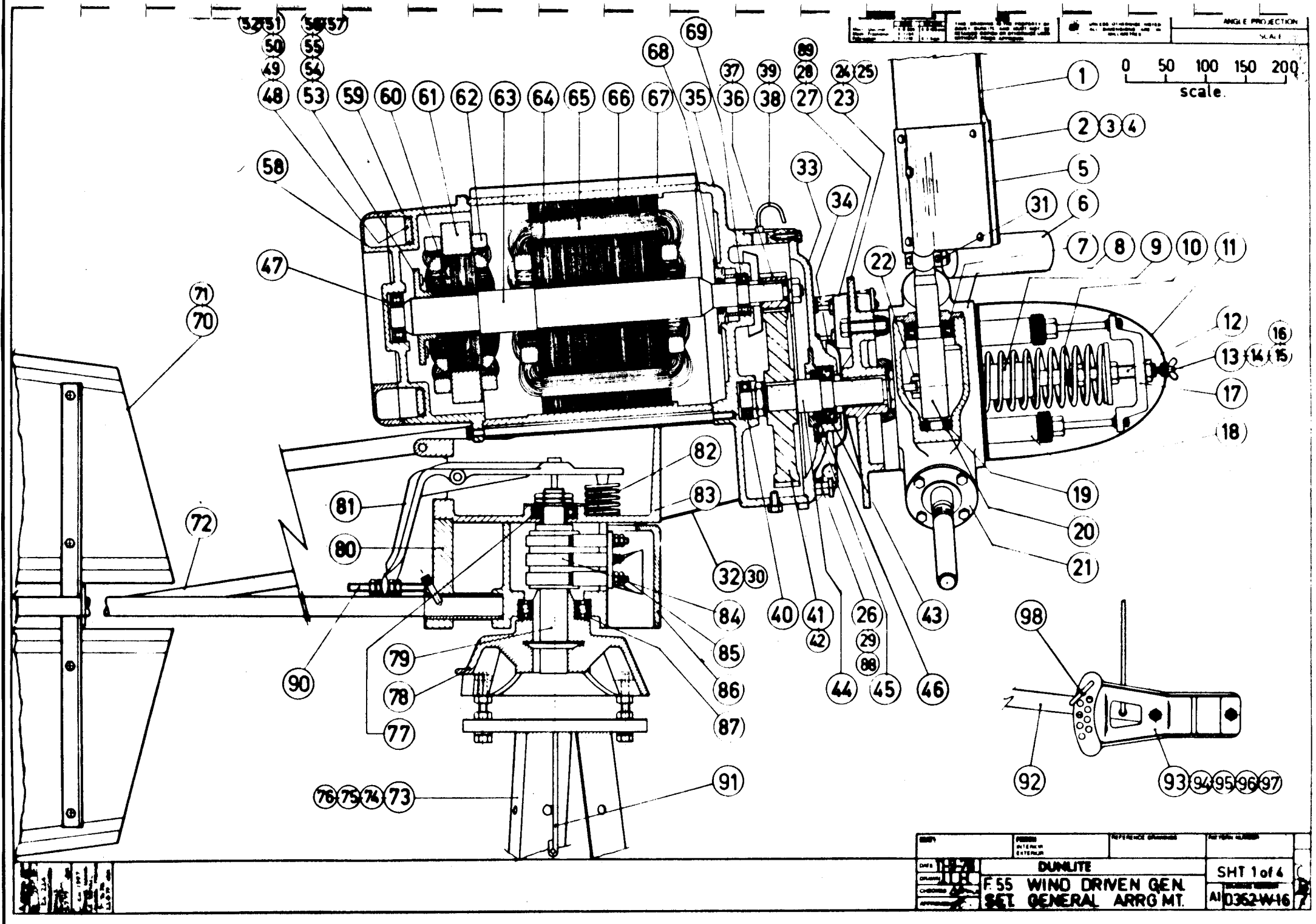
Check for signs of oil leakages indicating failur of oil seal, overfilling or blockage of breather. The gear oil used is very heavy and under cold conditions will not run out if the level bung is removed. Although oil leaks do sometimes occur, it is unlikely that the gear box will run dry. Therefore, exercise care in assessing the level of oil in the gear box as overfilling will certainly cause leaks. Check level when gear box is hot.

Check flexible conduit enclosing generator leads secure.

Remove rear cover to check connections of main generator leads clean and secure, only if loose connections are suspected.

Check condition of generator leads - replace if necessary.

1.1.12 Ensure all parts removed for inspection are correctly replaced and secure.


ANGLE PROJECTION
SCALE
0 50 100 150 200
scale.
DUNLITE
F.55 WIND DRIVEN GEN. SET GENERAL ARRG MT.
SHT 1 of 4
A1 0362-W-16

UNSPECIFIED TOLERANCES
DIMENSIONS SHOWN THUS — TO BE
00 ± 1 5
00 0 ± 5
00 00 ± 15

UNLESS OTHERWISE NOTED ALL DIMENSIONS ARE IN MILLIMETRES

ANGLE PROJECTION:

SCALE:

ITEM	QTY.	DESCRIPTION	PART NO.	DRG. NO.
1	3	Propeller Blade	33-10862-1	0352-W-03
2	3	Clamp Plate	33-1o949-1	0352-W-12
3	12	Bolts 5/16" BSW x 3" LG.		
4	12	5/16" BSW Nuts C/w Washers		
5	3	Blade Arm	33-10863-1	0352-W-05
6	3	Bob Weights	33-10969-1	0352-W-19
7	3	Bearing 6206 2RS		
8	1	VP Propeller Housing	1098	0020-W-27
9	1	Sliding Governor	1101	0020-W-23
10	1	Spring	33-10969-1	0352-W-18
11	1	Propeller Nose Cover	257	0020-W-18
12	1	Centre Shaft	1099B	0020-W-10
13	1	Top Attachment Screw	257-2	0020-W-18
14	1	Spacer Tube	4187	0020-W-104
15	1	Screw Retaining Washer	4138	0020-W-105
16	1	A8 Rubber Grommet		
17	1	Damper Assy. Rod Brkt.	4013	0020-W-14
18	2	Dampers	4014	0020-W-25
19	3	Bearing 6203 2RS		
20	3	Propeller Blade Shaft	1097B	0020-W-24
21	3	Prop. Blade Arm Shaft Grease Retainer	187	0020-W-22
22	3	Fork End Assy.	1975	0020-W-26
23	1	Disc Brake	33-10932-1	0352-W-01
24	3	Bolts ½" Whit 2" LG. HEX HD.		
25	1	Woodruff Key No.1010		
26	1	Pulley ST. STL. Ronston RF418		
27	1	Disc Brake Unit PBR DB1100		
28	1	Disc Brake Mtg. Plate	33-10933-1	0352-W-10
29	1	Spacer Ø17 O.D x Ø8 I.D. x 8LG.		
30	2	'D' Shackles ST. STL. Ronston RF616		
31	1	Clamp Bar	7646	0020-W-73
32	1	Brake Cable	33-11312-1	0352-W-27
33	1	Gear Box Lid	33-10942-1	0352-W-11
34	1	Oil Disc	317	0020-W-19
35	1	Gear Box Body	7010	0020-W-61

DATE: 11-9-78

DRAWN: J. HOUDE

CHECKED: C. Downe

APPROVED:

DESCRIPTION:
F55 WIND DRIVEN GEN. SET.
GENERAL ARRGT. SHT. 2 OF 4

PATTERN Nº

PART Nº

DUNLITE
28 ORSMOND STREET,
HINDMARSH S. AUST.

DRAWING Nº 0352-W-16

C

B

A

UNSPECIFIED TOLERANCES
DIMENSIONS SHOWN THUS — TO BE
00 ± 1 5
00 0 ± 5
00 00 ± 15

UNLESS OTHERWISE NOTED ALL DIMENSIONS ARE IN MILLIMETRES

ANGLE PROJECTION:

SCALE:

ITEM	QTY.	DESCRIPTION	PART NO.	DRG. NO.
36	1	Helical Gear Pinion	170	0020-W-82
37	1	Woodruff Key No.808		
38	1	Breather Pipe	4185	0020-W-76
39	1	Breather Pipe Cap Ø5 x 12mm LG.		
40	1	Bearing 6204		
41	1	Helical Gear	224	0020-W-83
42	1	Woodruff Key No.1010		
43	1	Bearing 6207- 2RS		
44	1	Gear Box Layshaft	01-10934-1	0352-W-02
45	1	Oil Retainer	2127	0020-W-80
46	1	Rubber Oil Seal-Gaco MIS 110		
47	1	Bearing 6305Z		
48	1 ea.	LH & RH Diode Plates	RH 2428A LH 2428B	0020-W-94
49	3 ea.	Diodes (-S3_AR40 OR MPR60) (+S3_AN40 OR MP60_MP100)	2428Z	
50	4	$\frac{1}{4}$" UNC HEX HD. Screw x 1" LG.		
51	2	5/16" UNC HEX HD. Terminal Bolt x $\frac{1}{2}$" LG.		
52	4	Insulation Washers 1.6 THK. x $\frac{1}{4}$" I.D.		
53	1	Diode Ring	15-10249-1	0050-A-03
54	4	Diode Plate Insulation	2428C	
55	4	Diodes 'Siemens' E1140 or 'Motorola MR 328	1971Z	
56	1	3/16" Whit C/Sunk Screw x 5/8" LG.		
57	1	3/16" Dia. Star Washer		
58	1	End Plate Cover	2446	0020-W-96
59	1	End Plate	2451	0020-W-97
60	*	Exciter Laminations	02-10248-1	0050-A-02
61	*	Exciter Stator Body	1972	0020-W-102
62	*	Exciter Windings		
63	1	Rotor Shaft	01-10864-1	0352-W-09
64	*	Rotor Laminations	02-10865-1	0352-W-04
65	*	Stator Windings		
66	*	Stator Laminations	2101	
67	1	Body	7025	0020-W-71
68	1	Grease Retainer	135	0020-W-75
69	1	Bearing 6205		

DATE: 11-9-78

DRAWN: J. HOLDEN.

CHECKED: C. Horne

APPROVED

DESCRIPTION:
F55 WIND DRIVEN GEN. SET.
GENERAL ARRGT.
SHT. 3 OF 4

PATTERN Nº C

PART Nº B

DRAWING Nº 0352-W-16 A

DUNLITE 28 ORSMOND STREET, HINDMARSH S. AUST.

UNSPECIFIED TOLERANCES			UNLESS OTHERWISE NOTED ALL DIMENSIONS ARE IN MILLIMETRES	ANGLE PROJECTION
DIMENSIONS SHOWN THUS		TO BE		SCALE:
00	±	1 5		
00 0	±	5		
00 00	±	15		

ITEM	QTY.	DESCRIPTION	PART NO.	DRG. NO.
70	2	Tail Wings	33-10950-1	0352-W-13
71	8	$\frac{1}{4}$"BSWx$\frac{3}{4}$"LG. H.H.S.S. 304ST/ST		
72	1	Tail	33-10951-1	0352-W-14
73	1	Tower Cap	1986	0020-W-50
74	4	5/8" Whit Set Screw x 4"LG. ST/ST L3D4		
75	4	5/8" Whit Unbrako Self Locknut		
76	4	5 8" Whit Nuts ST/STL 304		
77	1	Bearing RLS8 2RS		
78	1	Head Base	7015	0020-W-28
79	1	Head Base Shaft	H203-A	0020-W-38
80	1	Head Body Bottom Half	7020	0020-W-66
81		Rear Pivot Arm	210	0020-W-41
82	1	Pivot Arm Spring	209	0020-W-39
83	1	Head Body Top Half	7019	0020-W-65
84	1	Slipring Assy. Complete	2411	0020-W-35
85	3	Brush Springs Complete	2409	0020-W-31
86	1	Terminal Cover	196	0020-W-33
87	1	Bearing 6210 2RS		
88	1	Arm Pulley Fixing	33-11308-1	0352-W-23
89	1	Lever Arm	33-11309-1	0352-W-24
90	1	Adjustment Link	33-11310-1	0352-W-25
91	1	Centre Pullout Rod	212B	0020-W-57
92	1	Brake Handle	1079	0020-W-44
93	1Pair	Brake Clamp	7014	0020-W-43
94	1	5/16"UNC x 2$\frac{1}{2}$"LG. ZP SET SCREW	-	-
95	1	5/16"UNC x 1$\frac{3}{8}$"LG. ZP SET SCREW	-	-
96	2	5/16"UNC ZP HEX. Full Nuts	-	-
97	2	5/16" ZP Flat Washer	-	-
98	1	Pullout Lever Pin	334	0020-W-45

DATE: 11-9-78	DESCRIPTION:	PATTERN Nº	C
DRAWN: J. HOLDEN.	F55 WIND DRIVEN GEN. SET. GENERAL ARRGT. SHT. 4 OF 4	PART Nº	B
CHECKED: C Horne	DUNLITE 28 ORSMOND STREET, HINDMARSH S. AUST.	DRAWING Nº 0352-W-16	A
APPROVED:			

DRAWING Nº	PART Nº	DESCRIPTION OF PART: NAME	DESCRIPTION OF PART: DETAILS	Nº OFF PER UNIT	MATERIAL REQUIRED: TYPE	MATERIAL REQUIRED: DESCRIPTION	SOURCE
0352-W-16		GENERAL ARRANGEMENT COMPLETE PLANT	4 SHEETS				
			GEAR BOX ASSY.				
0020-W-83	224	HELICAL GEAR		1	M.S.	Ø232 x 38 LG. (FLAME CUT)	
0020-W-82	170	HELICAL GEAR PINION		1	STEEL		
0352-W-11	33 10942 1	GEAR BOX LID COMPLETE		1	LM6 AL.	USE PAT Nº 7011	
		SCREW	GEAR BOX LID TO BODY		M.S.	5/16" UNC. H.H.S.S. x 1 1/4" LONG Z.P	
		WASHER	" " - - "		M.S.	5/16" FLAT Z.P.	
0020-W-63	7013	GEAR BOX GASKET		1	PINK BLOT PAPER	x 0·3 THK	
0020-W-61	7010	GEAR BOX BODY		1	LM6 AL.		
0352-W-02	01 10934 1	LAY SHAFT		1	2% NICKEL SHAFT	Ø45 x 222 LG.	
		BEARING	LAYSHAFT TO GEAR BOX BODY	1	6207-2RS	'NATCHI' OR N.T.N.	
0020-W-80	2127	OIL RETAINER		1	LM6 AL.	PATTERN Nº 2127	
		OIL RETAINER FIXINGS		3	3/16" WHIT x 1/8" LG. c/SUNK SCREWS		
		RUBBER OIL SEAL		1	(GACO) MIS 110		
0020-W-81	226-3	DISTANCE WASHER		1	CAST IRON	PATTERN Nº 226	
0020-W-19	317	OIL DISC		1	SAE 1	Ø143 x 1 THICK BLANK (CAD PLATE)	
		KEY	LAY SHAFT TO GEAR	1	WOODRUFF KEY	1010	
		BEARING	LAY SHAFT	1	6204	'NATCHI' OR N.T.N.	
		NUT		1	HALF	1" SAE. HEX	
		WASHER		2	SPRING	1" Z.P.	
		NUT		1	FULL	1" SAE. HEX	
		WASHER		1	FLAT	1" Z.P.	
0020-W-76	4185	BREATHER PIPE		1	CU. TUBE		
		" "	CAP	1	PLASTIC	Ø5 x 12 mm. LG.	
		DRAIN PLUG-	OIL	1	M.S.	3/8" UNC. x 3/4" LG. H.H.S.S.	
		FILLER PLUG-	OIL	1	M.S.	" " "	
0020-W-78	274	DISTANCE SPACER		1	M.S.		

DATE	14-9-78	21-2-79	15-3-79	17-3-79	28-5-79	1-6-79	4-7-79	27-8-79	31-7-79	17-10-79	13-11-79
ISSUE	1	2	3	4	5	6	7	8	9	10	11

ENG. Nº 174 CH.N. 1915 C/N 1928 C/N 1933 EN. 217 E.N. 218 EN. 224 C/N 1979 EN. 226 EN 238 C.N 2049

DUNLITE

STANDARD BILL OF PARTS

SHEET 1 OF 16

PRODUCT NAME FRAME 35 WIND DRIVEN GENERATOR

MODEL Nº

DRAWING Nº	PART Nº	DESCRIPTION OF PART NAME	DESCRIPTION OF PART DETAILS	Nº OFF PER UNIT	MATERIAL REQUIRED TYPE	MATERIAL REQUIRED DESCRIPTION	SOURCE
			"GEAR BOX ASSY CONT."				
0020-W-79	192	OIL DISC		1	M.S.	ø126 x 1mm THK.	
		KEY	ALT SHAFT TO PINION	1	WOODRUFF	808	
		WASHERS	FILLER & OIL DRAIN	2	FLAT FIBRE	10mm I.D. x 20 O.D. x 1.5 THK.	
		OIL	GEARBOX	½ LITRE	SHELL	ALVANIA EPRO	

DATE	14.9.78	21.2.79	15.3.79	19.3.79	28.5.79	1.6.79	4.7.79	27.8.79	31.7.79	17.10.79	13.11.79
ISSUE	1	2	3	4	5	6	7	8	9	10	11

ENG. Nº 174 CHASSIS 1915 C/N 1928 C/N 1933 EN. 217 E.N 218 E.N 224 C/N 1999 EN 226 EN. 238 C.N. 2049

DUNLITE

STANDARD BILL OF PARTS

SHEET 2 OF 16

PRODUCT NAME FRAME 55 WIND DRIVEN GENERATOR

MODEL Nº

DRAWING Nº	PART Nº	DESCRIPTION OF PART NAME	DESCRIPTION OF PART DETAILS	Nº OFF PER UNIT	MATERIAL REQUIRED TYPE	MATERIAL REQUIRED DESCRIPTION	SOURCE
		ALTERNATOR ASSY.					
0352-W-09	01 10864 1	SHAFT		1	M.S. S12 L14	Ø50 x 522 LG.	
		NUT	}	1	M.S.	5/8" UNF. HEX. FULL Z.P.	
		WASHER	} END OF SHAFT	1	M.S.	5/8" FLAT Z.P.	
		WASHER	}	1	SP/STL.	5/8" SPRING Z.P.	
		BEARING	(GEARBOX END)	1	6205	'NATCHI' OR N.T.N.	
0020-W-77	282	WASHER		1	1/4" FELT	6·4 THICK	
0020-W-75	135	GREASE RETAINER		1	LM6 AL.	PATTERN Nº D5M	
		SCREWS	GREASE RETAINER FIXINGS	3	3/16" WHIT x 3/4"	LG. C/SUNK M.S.	
		BEARING	(EXCITER END)	1	6305Z	'NATCHI' OR N.T.N.	
0020-W-71	7025	BODY		1	LM6 AL.	DIECAST	
0020-W-88	1978-2	BODY STUD		1	M.S.	Ø9·5 x 397 LONG. (B.S.W.)	
		NUT	BODY BOLTS	1	304 ST/STL.	3/8" BSW. HEX. FULL	
0020-W-88	1978-1	BODY BOLTS		2	M.S.	Ø9·5 x 344 LONG. (B.S.W.)	
		WASHER		2	304 ST/STL.	3/8" FLAT	
0020-W-96	2446	END PLATE COVER		1	LM6 AL.	PATTERN Nº 2446	
		BOLT		4	1/4" UNC x 2 1/2"	LG. HEX. HD.	
		WASHER		4	1/4" FLAT		
0020-W-97	2451	END PLATE		1	LM6 AL.	PATTERN Nº 1965	
8							
8							
4		SADDLE CONDUIT		1	M.S.	1/2" GALV.	
		SCREW		2	M.S.	5/32" WHIT x 1/4" LG. CH. HD.	
		BUSH	'ELMACO' 145 PVC	3	PLASTIC	3/4" MALE	
8		TERM. BLK.		1	P.V.C.	2 WAY 'AMPERE' 30 AMP. CAT# 30P	
		SCREW		2	M.S.	5/32" B.S.W. x 3/4" LG. RD. HD. ZP.	
		WASHERS		2	STAR.	5/32. I.D.	
		CRIMP LUGS	3/16" 'UTILUX'	6	BRASS	'UTILUX' H1403-S	
0020-W-93	7257	INSULATION TUBE		4	BAKELITE TUBE	9·5 O.D. x 6·4 I.D. x 57 LG.	
		EXCITER WINDINGS - STATOR			SEE WINDING	DATA SHT.	
		" "	- ROTOR		" "	" "	

DATE	14-9-78	21-2-79	15-3-79	19-3-79	28-5-79	1-6-79	4-7-79	27-8-79	31-7-79	17-10-79	13-11-79
ISSUE	1	2	3	4	5	6	7	8	No 9	10	11

ENG. Nº174 CHANGES C/N 1928 C/N 1933 EN. 217 E.N.218 E.N.224 C/N 1999 EN. 226 EN. 228 C.N. 2049

DUNLITE

STANDARD BILL OF PARTS

PRODUCT NAME 15 WIND DRIVEN GENERATOR

SHEET 3 OF 16

MODEL Nº

DRAWING Nº	PART Nº			DESCRIPTION OF PART NAME	DESCRIPTION OF PART DETAILS	Nº OFF PER UNIT	MATERIAL REQUIRED TYPE	MATERIAL REQUIRED DESCRIPTION	SOURCE
					ALTERNATOR ASSY. CONT.				
[illegible]-A-03	15	10249	1	DIODE RING		1	LM6 AL.		
0020-W-98		2428-C		DIODE PLATE INSULATION		4	MICA.		
		1971 Z		DIODES	(NOTE SHOULD NOT BE MIXED)	4	E1140	'SIEMENS' OR 'MOTOROLA' MR 328	
				SCREW		1	M.S.	3/16" WHIT x 5/8" LG. C/SUNK	
0020-W-94		2428A		DIODE PLATE	P.L. NEGATIVE	1	LM6 AL.		
		2428 Z		DIODE PLATE	ASSEMBLY LH. & RH.	3 EACH.		(-53-AR40 OR MPR60 (+53-AN40 OR MP60-MP-100)	
				TERMINAL BOLT		2	BRASS	5/16" UNC x 1/2" LG. HEX. HD. ZP.	
				INSULATING WASHERS		4	[illegible] FIBRE	1/4" I.D.	
0020-W-99		2428D		DIODE PLATE	SCREW INSULATION	4	BAKELITE TUBE		
0020-W-92		2788		OUTER ELECTRICAL LOOM		1			
0352-W-04	02	10865		ROTOR LAMINATIONS				SEE DATA SHEET	
				STATOR WINDINGS				" " "	
		2101		LAMINATIONS	- STATOR				
0050-A-02	02	10248	1	EXCITER LAMINATIONS		38			
0020-W-102		1972		EXCITER STATOR BODY		1	S.G. IRON	PATTERN Nº 1972	
				BOLTS		4	MS ZP	1/4 UNC x 2 1/2" LONG	
				WASHERS		4	MS. ZP.	1/4" FLAT	
0020-W-94		2428B		DIODE PLATE	LH	1	LM6 AL		
				WASHER		4		1/4" SPRING. Z.P.	
				WASHER		4	STL.	3/16" STAR	
No.5 0352-W-20	02	11169	2	ASSY.	EXCITER LAM. STACK (38)	1			
No.5 0352-W-21	17	11178	1	RIVET	" " "	3	MILD STL.	ϕ5 x 42 LONG	

DATE	14-9-78	21-2-79	15-3-79	19-3-79	28-5-79	1-6-79	4-7-79	27-8-79	31-7-79	17-10-79	13-11-79
ISSUE	1	2	3	4	5	6	7	8	9	10	11

ENG. Nº 174 C/N 1915 C/N 1928 C/N 1933 EN. 217. EN 218 E.N. 224 C/N 1999 EN. 226 EN. 238 C.N. 2049

DUNLITE

STANDARD BILL OF PARTS

SHEET 4 OF 16

PRODUCT NAME RANGER 5 WIND DRIVEN GENERATOR

MODEL Nº

DRAWING Nº	PART Nº	DESCRIPTION OF PART NAME	DESCRIPTION OF PART DETAILS	Nº OFF PER UNIT	MATERIAL REQUIRED TYPE	MATERIAL REQUIRED DESCRIPTION	SOURCE
			BRAKE ASSY				
0352-W-01	33 10932 1	DISC BRAKE		1	CAST IRON	PAT # 10932	
		CALLIPER	DISC BRAKE UNIT	1	P.B.R.	DB1100	
		KEY	LAYSHAFT TO DISC BRAK	1	STL	WOODRUFF 1010	
		SCREW	DISC BRAKE TO V.P PROP HSG	3	STL.	½" BSW. x 2" LG. HEX. HD. Z.P	
		WASHER	" " " " " "	3	"	½" FLAT Z.P	
0352-W-23	33 11308 1	ARM	PULLEY FIX'G	1	BRIGHT FLAT	25 x 6 x 235 LG. Z.P.	
0352-W-26	33 11311 1	SPACER		4	ALUMINIUM	Ø17 OD x Ø8.1 ID x 8mm LG.	
0352-W-25	33 11310 1	LINK	ADJUSTMENT	1	321 ST. STL.	3/8 BSW x 104 LG.	
0352-W-27	33 11312 1	CABLE	BRAKE	1	ST STL	Ø2.43 — 1x19 WIRE SEE DRG. x 562 LG.	
		SHACKLE	'D' SHACKLE	2	ST. STL.	RF 616 'RONSON'	
		PULLY	WIRE	1	ST. STL.	RF 418 'RONSON'	
0352-W-24	33 11309 1	ARM	LEVER BOLT TO BRAKE UNIT				
			REMOVE SPRING LOCATING PIN & USE		HOLE ALONG WITH ADJACENT HOLE ON BRAKE UNIT		
		SCREW	LEVER ARM TO BRAKE	2	ST. STL.	¼ BSW x 5/8 LG. HEX. HD.	
		NUT	" " " "	2	ST. STL.	¼ BSW HEX	
		WASHER	" " " "	2	ST. STL.	¼" FLAT	
		WASHER	" " " "	2	STL	¼" SPRING	
		NUT	LINK ADJUSTMENT	4	ST. STL.	3/8 BSW HEX.	
		SCREW	FIX'G PULLY TO PULLY ARM	2	ST. STL.	5/32 BSW x ¾ LG HEX. HD	
		NUT	" " " " "	2	ST STL	5/32 BSW HEX	
		WASHER	" " " " "	2	ST. STL.	5/32 FLAT	
		WASHER	" " " " "	2	ST. STL.	5/32 SPRING.	
0352-W-10	33 10933 1	MTG. PR		1	M.S.	51 x 6.5 F.M.S x 156 LG	
		SCREW	DISC BRAKE MTG. PR TO G/B. LID.	2	M.S. Z.P	5/16 U.N.C. x 1½ LG.	
		SCREW	PULLY ARM TO GEARBOX	2	M.S. Z.P.	5/16 U.N.C. x 2" LG.	
		WASHER		4	M.S. Z.P	5/16 FLAT	
		WASHER		4	STL. Z.P.	5/16 SPRING.	

DATE	3.7.79	27.8.79	31-7-79	17-10-79	13.11.79
ISSUE	7	8	9	10	11

EN. 224. VN1111 EN. 226. EN. 238 - N. 2049.

DUNLITE

STANDARD BILL OF PARTS

SHEET 5 OF 16

PRODUCT NAME F. 55 WIND DRIVEN GENERATOR.

MODEL Nº

DRAWING Nº	PART Nº	DESCRIPTION OF PART NAME	DESCRIPTION OF PART DETAILS	Nº OFF PER UNIT	MATERIAL REQUIRED TYPE	MATERIAL REQUIRED DESCRIPTION	SOURCE
			VP. PROPELLER HUB ASSY.				
0020-W-27	1098B	PROPELLER	HOUSING	1	CAST AL.	PATTERN #1098	
0020-W-23	1101	SLIDING	GOVERNOR	1	CAST IRON	" #1073	
0020-W-25	4014	DAMPER ASSY.		2			
0020-W-01	4007	WASHER SPACER		4	STL.	'GEE JAY' PACK #5001/7	
0020-W-02	4011	WASHER SEALING		4	RUBBER	480 ^{2}mm. x 1·6 THK.	
0020-W-03	4004	NECK DAMPER		2	BRASS	Ø38 x 32 LG.	
0020-W-04	4008	CYLINDER BOTTOM		2	BRASS	Ø32 x 28·6 LG.	
0020-W-05	4006	PISTON		2	BRASS	Ø16 x 28·6 LG.	
0020-W-06	4005	GLAND NUT		2	BRASS	28·2 A/F. x 19 LG.	
0020-W-07	4012	CYLINDER		2	STL. TUBE	32 O.D. x 1·6 WALL x 108 LG.	
0020-W-08	4003	CONNECTING ROD		2	ST/STL 303	Ø8 x 146 LG.	
0020-W-14	4013	BRACKET	CONNECTING ROD	1	CAST IRON	PATTERN 1092 Z.P.	
0020-W-16	4009	GLAND	SEALING	2	NITROL RUBBER THYER PT. #C2031		
0020-W-17	4010	WASHER	DAMPER ASSY. SEALING	2	PERMANITE	1130 x 1130 x 6·4TH"	
		NUTS	HEX LOCK	6	STL.	5/16" UNC Z.P.	
		WASHERS	FLAT	4	STL.	5/16" Z.P.	
		SCREW	HEX. HD.	2	304 ST/STL	1/4" BSW. x 1" LG.	
		NUTS	HEX. LOCK	2	304 ST/STL	1/4" BSW.	
0020-W-21	186	RETAINER	CENTRE SHAFT SPRING	1	CAST AL.	PATTERN Nº 186	
0352-W-18	33 1098 1	SPRING	CENTRE	1	8mm. WIRE	RANGE 2 MECH. SPRING WIRE	
0020-W-10	1099 E	SHAFT	CENTRE	1	ST/STL 303	Ø19 x 283 LG.	
		NUT	HEX. FULL	1	M.S.	5/8" SAE x 18 T.P.I. Z.P.	
		NUT	HEX. HALF	3	M.S.	5/8" SAE x 18 T.P.I Z.P.	
0020-W-24	1097 B	SHAFT	PROPELLER BLADE	3	2% NICKEL STL.	Ø35 x 381 LG.	
		SET SCREW	HARDENED	3	STL.	5/16" UNC. SQ HD. x 5/8" LG. Z.P.	
		BEARING		3	6203 - 2 RS	'NATCHI'	
		BEARING		3	6206 - 2RS	'N.T.N.'	
0020-W-10	1099-2	WASHER	CENTRE SHAFT WASHER	1	ST/STL 303	Ø38 x 3m Ø19 BORE	
0020-W-22	187	RETAINER	GREASE	3	CAST AL.	PATT. #654	
		SCREW	HEX. HD.	12	STL.	5/16" UNC. x 1" LG.	

DATE	14-9-78	21-2-79	15-3-79	19-3-79	28-5-79	1-6-79	4-7-79	27-8-79	31-10-79	17-10-79	13-11-79
ISSUE	1	2	3	4	5	6	7	8	9	10	11

ENG. Nº 174 CH 1915 C/N 1928 C/N 1933 EN. 217 E.N 218 E.N 224 C/N 1977 EN. 226 EN 238 C.N 2049

DUNLITE

STANDARD BILL OF PARTS

SHEET 6 OF 16

PRODUCT NAME 5 KW WIND DRIVEN GENERATOR

MODEL Nº

DRAWING Nº	PART Nº	DESCRIPTION OF PART NAME	DESCRIPTION OF PART DETAILS	Nº OFF PER UNIT	MATERIAL REQUIRED TYPE	MATERIAL REQUIRED DESCRIPTION	SOURCE
			V.P. PROPELLER HUB ASSY CONT.				
0020-W-03	4186	GUIDE PIN		1	BRASS	Ø8 x 127 LG.	
0020-W-18	257-1	COVER	PROPELLER NOSE	1	ALUMINIUM	SPUN 1.0 THK.	
0020-W-18	257-2	SCREW	TOP ATTACHMENT	1	BRASS	MADE TO DRG	
0020-W-104	4187	SPACER	TUBE	1	BAKELITE	6.41 I.D. x 9.50 O.D. x 19 LG.	
0020-W-105	4138	WASHER	SCREW RETAINING	1	NEOPRENE	483 x 483 x 4 THK.	
		GROMMET		1	RUBBER	A8	
		O' RING	NOSE COVER SEALING	1	BS. 263		
0020-W-09	259-2	BEARING	SLIDING GOVERNOR	2	OILITE BRONZE	19 I.D. x 22.20 O.D. x 3" LG.	
0020-W-26	1975B	FORK END	COMPLETE ASSY	3			
0020-W-15	1093-2	BEARING	OILITE 52000/24	3	BRONZE	8 I.D. x 11 O.D. x 9.5 LG.	
0020-W-120 17	10993 1	CLEVIS PIN		3	303 ST/STL	Ø12.7 x 29 LG.	
		SPLIT PIN		3	302 ST/STL.	3/32" Ø x 3/4" LG.	
0020-W-117 20	10432 1	FORK END		3	M.S. Z.P.	16 x 16 x 71.5 LG.	
0020-W-15	1093-3	TYRE		3	NYLON	Ø32 x 9.5 LONG	
		WASHER	CLEVIS PIN TO FORK	1	STL.	5/16" FLAT	

DATE	14.9.78	21.2.79	15.3.79	19.3.79	28-5-79	1.6.79	4.7.79	28.8.79	31.10.79	17-10-79	13.11.79
ISSUE	1	2	3	4	5	6	7	8	9	10	11

ENG. N 174 C/N 1115 C/N 1928 C/N 1933 EN. 217 E.N 218 E.N. 224 C/N 1999 EN 226 EN. 238 C.N. 2049

DUNLITE

STANDARD BILL OF PARTS

SHEET 7 OF 16

PRODUCT NAME FRAME 55 WIND DRIVEN GENERATOR.

MODEL Nº

DRAWING Nº	PART Nº	DESCRIPTION OF PART NAME	DESCRIPTION OF PART DETAILS	Nº OFF PER UNIT	MATERIAL REQUIRED TYPE	MATERIAL REQUIRED DESCRIPTION	SOURCE
			HEAD ASSY.				
3 0020-W-31	2409-B	BRUSH PLATE	PACKER	1	BAKELITE	6·4 THK 76 x 26 LG.	
0020-W-33	196	COVER	HD. TERMINAL	1	CAST. AL.	PATT. # 196	
		SCREWS	RD. HD.	2	304 ST/STL.	3/16" WHIT X 1 1/4" LG.	
		WASHERS	FLAT	2	304 ST/STL.	3/16"	
0020-W-31	2409	BRUSH SPRINGS	COMPLETE	1			
0020-W-31	2409	BRUSH PLATE		1	BAKELITE	6·4 THK. x 76 x 124 LG.	
0020-W-31	2409	CENTRE LUG		3		5/16" DIA. Nº 646 SHORT	
		SPADE LUG		6	LITLUX	H1401 S	
		LEAD	FLEXIBLE	6		43/.0045 x 2 3/8" LONG	
0020-W-29	286E	BRUSHES		6	CARBON	COPPER MORGANITE	
0020-W-34	B2410	BRUSH SPRINGS	FIELD BRUSH	1	HD. PHOS.	BRONZE 0·5 THK. 14·3 x 117·5	
0020-W-34	A2410	BRUSH SPRINGS		2	HD. PHOS.	BRONZE 0·5 THK. 19 x 117·5	
		SCREWS	RD. HD.	3	BRASS	5/16" WHIT x 1 1/4" LG.	
		NUTS	HEX. HALF	6	BRASS	5/16" WHIT ZP.	
		WASHERS	FLAT	9	BRASS	5/16" ZP.	
		WASHERS	SPRING	6	STL.	5/16" ZP.	
		SCREWS	RD. HD	6	BRASS	5/16" WHIT x 3/8" LG. ZP.	
		WASHERS	FLAT	6	BRASS	3/16" ZP.	
		WASHERS	STAR	6	STL.	3/16" ZP.	
		SCREWS	HARDENED METALLIC DRIVE	3	BRASS	Nº 0 x 1/4 LG.	
		SCREWS	RD. HD.	2	304 ST./STL	3/16" WHIT x 5/8" LG.	
		WASHERS	SPRING	2	STL.	3/16" ZP.	
		BEARING.	SKF RLS8-2RS	1			
0020-W-32	193	RETAINER	GREASE TOP	1	M.S.	REWORK 1" M.S. FLAT WASHER	
0020-W-46	219	COVER	TOP GREASE RETAINER	1	M.S.	1-0 THK.	
		NUTS	LOCK	2	M.S.	3/4" B.S.P.	

DATE	14-9-78	21.2.79	15.3.79	19.3.79	28-5-79	1.6.79	4.7.79	27.8.79	31-7-79	17-10-79	13.11.79
ISSUE	1	2	3	4	5	6	7	8	9	10	11

ENG. Nº 174. CN 1925 C/N 1928 C/N 1933 EN. 217 E.N 218 E.N 224 C/N 1999 EN. 226 EN 238 C.N. 2047

DUNLITE

STANDARD BILL OF PARTS

SHEET 8 OF 16

PRODUCT NAME FR... 3 WIND DRIVEN GENERATOR

MODEL Nº

DRAWING Nº	PART Nº	DESCRIPTION OF PART		Nº OFF PER UNIT	MATERIAL REQUIRED		SOURCE
		NAME	DETAILS		TYPE	DESCRIPTION	
			HEAD ASSY. CONT.				
0020-W-39	209	SPRING	PIVOT ARM	1	SPRING STL.		
		SCREW *		4	ST. / STL.	5/8" WHIT x 4" LG. H.H.S.S.	
		NUT	HEX. LOCKNUT	4	UNBRAKO	5/8" WHIT	
		NUT	HEX. FULL	4	ST./STL.	5/8" WHIT	
		NUT	HEX. HALF	4	ST./STL.	5/8" WHIT	
		WASHER	FLAT	10	ST./STL.	5/8" WHIT	
0020-W-38	203	STUB SHAFT		1	M.S.	Ø35 x 230 LG.	
0020-W-28	7015	HEAD BASE	CASTING ONLY	1		DIE CAST	
0020-W-40	214	ANCHOR	BASE PLATE	1	MALLEABLE IRON	PATTERN Nº 214	
0020-W-30	194	RETAINER	BOTTOM GREASE	1	M.S.	1.0 THICK	
		BEARING	SKF 6210 - 2RS.	1			
				1			
0020-W-36	2408	TERMINALS	STRIP BASE COMPLETE	1	BAKELITE	6 THK. x 25 x 116 LG.	
		SCREWS	RD. HD.	2.	304 ST/STL.	3/16" WHIT x 1/2" LG.	
		WASHERS	STAR	2	STL.	3/16" Z.P.	
		WASHERS	FLAT	2	304 ST./STL.	3/16"	
		SCREW	RD. HD.	1	BRASS	1/4" WHIT x 1" LG. Z.P.	
		NUT	HEX HALF	2	BRASS	1/4" WHIT Z.P.	
		WASHER	FLAT	4	BRASS	1/4"	
		WASHER	SPRING	2	STL.	1/4" Z.P.	
		SCREWS	RD. HD.	2	BRASS	5/16" WHIT x 1 1/4" LG. Z.P.	
		NUTS	HEX. HALF	4	BRASS	5/16" WHIT Z.P.	
		WASHER *	FLAT	8	BRASS	5/16" Z.P.	
		WASHER	SPRING	4	STL.	5/16" Z.P.	
		CRIMP LUGS		2	UTILUX H1408		
		SOLDERLESS LUG		1	UTILUX H132		
0020-W-116	7847	TERMINAL COVER		1	CAST. AL.	PATT. # 7847	
		SCREWS	RD. HD.	2	304 ST./STL.	3/16" WHIT x 1/2" LG.	
		WASHERS	FLAT	2	304 ST./STL.	3/16"	

DATE	14-9-78	21.2.79	15.3.79	19.3.79	28-5-79	1.6.79	4.7.79	27.8.79	3-7-79	17-10-79	13.11.79
ISSUE	1	2	3	4	5	6	7	8	9	10	11

ENG. Nº 174 CANCELS C/N 1728 C/N 1733 E.N. 217 E.N 218 E.N. 224 C/N 1997 EN. 226 EN. 238 C.N. 2049

DUNLITE

STANDARD BILL OF PARTS

SHEET 9 OF 16

PRODUCT NAME [illegible] WIND DRIVEN GENERATOR

MODEL Nº

DRAWING Nº	PART Nº	DESCRIPTION OF PART		Nº OFF PER UNIT	MATERIAL REQUIRED		SOURCE
		NAME	HEAD ASSY. CONT.		TYPE	DESCRIPTION	
	NOTE:-	HEAD BODY TAIL	INSERT MUST BE SUPPLIED TO FOUNDRY TO ENABLE MANUFACTURE OF BODY BOTTOM HALF.				
0020-W-65	7019	BODY	TOP HALF	1	CAST. AL.	DIE CAST	
0020-W-66	7020	BODY	BOTTOM HALF	1	CAST. AL.	DIE CAST	
0020-W-70	7024	INSERT	HEAD BODY TAIL	1	M.S. TUBE	CAST IN BODY. BOTTOM HALF (SEE ABOVE NOTE)	
		SCREWS	HEX. HD.	6	304 ST./STL.	5/16" B.S.W. x 1" LG.	
		NUTS	HEX. FULL	6	304 ST./STL.	5/16" B.S.W.	
		WASHERS	FLAT	6	304 ST./STL.	5/16"	
		WASHERS	SPRING	6	STL.	5/16" Z.P.	
		RIVETS		2	ALUM.	5/16" DIA. x 3/4" LG. C/SUNK HEAD.	
No.10.	17 04028	'U' BOLT	HEAD BODY	2	STL.	WELDED CONSTRUCTION.	
0020-W-69	7097	CLAMP PIN	HEAD BODY	2	ST./STL. 303	ϕ10 x 180 LG.	
		WASHERS		4	ST./STL.	ϕ10	
		SPLIT PIN		2	STEEL	3/32" DIA. x 3/4" LG. Z.P.	
		SCREWS	HEX. HD.	2	304 ST./STL.	3/8" B.S.W. x 1 1/2" LG.	
		WASHERS	FLAT	4	304 ST./STL.	3/8"	
		NUTS	HEX. LOCK.	2	304 ST./STL.	3/8" B.S.W.	
356.	6356	DISTANCE PIECE	(FOR BODY LOCATING SCREW)	1	STL.	ϕ1/2 x 10 I.D. x 12.7 LG.	
		SOC. HD. SCREW	(FOR BODY LOCATING SCREW)	1	304 ST./STL.	3/8" UNC x 1 1/4" LG.	
0020-W-41	210	PIVOT ARM.	REAR	1	PATT. # 210 MAL'BLE IRON		
0020-W-49	211	PIVOT PIN.	REAR	1	M.S.	ϕ10 x 87 LG.	
		SPLIT PINS.		2	M.S.	3/32" DIA. x 1" LG.	
		WASHERS		2	304 ST./STL.	3/8" DIA. FLAT	
0020-W-43	7014	CLAMP	BREAK HANDLE	2	CAST. AL.	DIE CAST	
		SCREW	HEX. HD.	1	M.S.	5/16" UNC. x 2 1/2" LG. Z.P.	
		SCREW	HEX. HD.	1	M.S.	5/16" UNC. x 1 3/8" LG. Z.P.	
		NUT	HEX. FULL	2	M.S.	5/16" UNC. Z.P.	
		WASHERS	FLAT	2	M.S.	5/16" Z.P.	
0020-W-45	334	PIN	FURLING HANDLE	1	B.M.S.	Ø5 x 230 LG.	
0020-W-44	1079	BRAKE	HANDLE	1	M.S.	6 x 25 x 460 LG.	
0020-W-57	2128	CENTRE	PULL ROD	1	303 ST./STL.	ϕ6 x 740 LG.	
0020-W-47	213	FERRULE	FITTED TO CENTRE PULL ROD.	1	M.S.	22.2 Ø x 16 M.S.	
	NOTE:-	STUB SHAFT & ANCHOR PLATE WELDED TOGETHER & SUPPLIED TO FOUNDRY TO PRODUCE COMPLETE HEAD BASE					

DATE	14-9-78	21.2.79	15.3.79	19.3.79	28.5.79	1.6.79	4.7.79	27.8.79	31-7-79	17-10-79	13.11.79
ISSUE	1	2	3	4	5	6	7	8	9	No.10	11

ENG. Nº 174. C/N 1915 C/N 1928 C/N 1933 EN. 217 E.N 218 E.N. 224 C/N 1999 EN. 226 EN. 238 C.N. 2049

DUNLITE

STANDARD BILL OF PARTS

SHEET 10 OF 16

PRODUCT NAME FURLING WIND DRIVEN GENERATOR

MODEL Nº

DRAWING Nº	PART Nº			DESCRIPTION OF PART NAME	DESCRIPTION OF PART DETAILS	Nº OFF PER UNIT	MATERIAL REQUIRED TYPE	MATERIAL REQUIRED DESCRIPTION	SOURCE
					HEAD ASSY CONT				
0020-W-35	06	02411	2	SLIPRING	ASSY COMPLETE	1.			
0020-W-121	06	11020	2	"	RING & WIRE ASSY	1			
" " "	06	11018	2	"	" " " "	1			
" " "	06	11016	2	"	" " " "	1			
0020-W-124	06	11017	1	WIRE		1		RED PVC 7/052 x 432LG.	
" " "	06	11019	1	"		1		BLACK PVC 7/052 x 381LG.	
" " "	06	11021	1	"		1		GREEN PVC 7/036 x 406LG.	
0020-W-37	06	10191	1	SLIPRING	WITH DRILLED HOLE	3	BRONZE	CASTING PT. #06-03709-0	
0020-W-122	06	11022	1	"	CENTRE TUBE	1	MS	Ø38 x 1.2TH" WALL TUBE 78LG.	
No.10 0352-W-30	20	11440	1	BRACKET	BODY CLAMP	2.	MILD STEEL	WELDED CONSTRUCTION.	

DATE	14-9-78	21-2-79	15-3-79	19-3-79	28-5-79	1-6-79	4-7-79	27-8-79	31-7-79	17-10-79	13-11-79
ISSUE	1	2	3	4	5	6	7	8	9	10	11

ENG. Nº 174 C/N 1915 C/N 1928 C/N 1933 EN. 217 E.N. 218 E.N. 224 C/N 1971 EN. 226 EN. 238 C.N. 2049

DUNLITE

STANDARD BILL OF PARTS

SHEET 11 OF 16

PRODUCT NAME FRAME 55 WIND DRIVEN GENERATOR

MODEL Nº

DRAWING Nº	PART Nº	DESCRIPTION OF PART NAME	DESCRIPTION OF PART DETAILS	Nº OFF PER UNIT	MATERIAL REQUIRED TYPE	MATERIAL REQUIRED DESCRIPTION	SOURCE
			"PROPELLER BLADE ARM ASSY"				
0352-W-12	33 10949 1	CLAMP PL.	FOR BLADE ARM	3	M.S. PL.	150 x 6·5TH" x 205	
No.9 0352-W-29	33 11355 1	CLAMP BAR		3	CAST AL.		
0352-W-05	33 10863 1	BLADE ARM		3	CAST AL	PAT.# 10863	
		SCREWS	CLAMP BAR TO BLADE ARM	3	304 ST/STL	1/2" BSW x 3" LG. HEX. HD	
		NUTS	" " " " "	3	304 ST/STL	1/2" BSW HEX FULL	
		WASHERS	" " " " "	3	304 ST/STL	1/2" SPRING	
		BOLT	THRU CLAMP-PROP & BLADE ARM	3	304 ST/STL	3/8 BSW x 4 3/4 LG HEX HD	
0352-W-03	33 10862 1	PROPELLER BLADES		3	TIMBER	JELUTONG	
		BOLTS	PROP BLADE FIXINGS	12	304 ST/STL	5/16" BSW x 3" LG. HEX. HD	
		WASHERS	" " "	12	304 ST/STL	5/16" FLAT	
		WASHERS	" " "	12	304 ST/STL	5/16" SPRING	
		NUTS	" " "	12	304 ST/STL	5/16 BSW HEX FULL	
7 0352-W-28	33 11318 1	WEIGHTS	PROP BALANCE	3	M.S.	COMPLETE	
		WASHERS	" "	3	STL	1/2" SPRING	
		NUTS	" "	3	M.S.	1/2" U.N.F.	
		NUT	THRO. CLAMP. PROP & BLADE ARM	1	304 ST./STL.	3/8" B.S.W. HEX. FULL	
		WASHER	THRO. CLAMP. PROP & BLADE ARM.	1	304 ST./STL	3/8" FLAT	
0352-W-06		ASSY DRG	BLADE ARM TO PROP SHAFT	*	INFO ONLY		
		WASHER	BLADE ARM TO PROP. SHAFT.	1	INFO. ONLY	3/8" SPRING.	

DATE	14·9·78	21·2·79	15·3·79	19·3·79	28·5·79	1·6·79	4·7·79	27·8·79	31·7·79	17·10·79	13·11·79
ISSUE	1	2	3	4	5	6	7	8	9	10	11

ENG. Nº 174 LWIRIS C/N 1928 C/N 1733 EN. 217 E.N 218 E.N 224 C/N 1999 EN. 226 EN. 238 C.N. 2049

DUNLITE

STANDARD BILL OF PARTS

SHEET 12 OF 16

PRODUCT NAME FRAME 55 WIND DRIVEN GENERATOR.

MODEL Nº

DRAWING Nº	PART Nº	DESCRIPTION OF PART NAME	DESCRIPTION OF PART DETAILS	Nº OFF PER UNIT	MATERIAL REQUIRED TYPE	MATERIAL REQUIRED DESCRIPTION	SOURCE
			TAIL ASSY.				
0352-W-13	33 10950 1	TAIL WINGS	TOP & BOTTOM.	1 EA.	ZINC ANNEAL	1-4 THICK	
		SET SCREWS		8	304 ST./STL.	1/4" BSW. x 3/4" LG. HEX. HD.	
		NUTS FULL		8	304 ST./STL.	1/4 BSW.	
		WASHERS	FLAT	16	304 ST./STL.	1/4" BSW	
		WASHERS	SPRING	8	STL.	1/4 BSW	
0352-W-14	33 10951 1	TAIL		1	M.S. TUBE	WELDED CONSTRUCTION	
		SET SCREWS		4	304 ST./STL.	5/16" L.W. x 1" LONG. HEX. HD.	
		WASHERS	FLAT	4	304 ST./STL.	5/16" BSW.	
		WASHERS	SPRING	4	ST./STL.	5/16 BSW.	
		SET SCREW	TAIL LOCK	1	ST./STL.	5/16" UNC. x 2½" LG. SQ. HD. (CUP POINT)	
		WASHER	TAIL LOCK	1	M/STL.	5/16" STAR Z.P.	
		NUT	TAIL LOCK	1	ST./STL.	5/16" UNC. HALF NUT	
6		RUBBER STOP	FOR FITTING ON END OF TAIL	1	BLK RUBBER	1½ DIA CHAIR SHEATH	CLARK RUBBER

DATE	14-9-78	21.2.79	15.3.79	19.3.79	28.5.79	1.6.78	4.7.79	27.8.79	31-7-79	17-10-79	13.11.79
ISSUE	1	2	3	4	5	6	7	8	9	10	11

ENG. Nº 174 C/N 1915 C/N 1928 C/N 1933 EN. 217 EN. 218 E.N 224 C/N 1999 EN. 226 EN. 232 C.N. 2049.

DUNLITE

STANDARD BILL OF PARTS

SHEET 13 OF 16

PRODUCT NAME FRASER WIND DRIVEN GENERATOR

MODEL Nº

DRAWING Nº	PART Nº	DESCRIPTION OF PART NAME	DESCRIPTION OF PART DETAILS	Nº OFF PER UNIT	MATERIAL REQUIRED TYPE	MATERIAL REQUIRED DESCRIPTION	SOURCE
0350-S-02		SCHEMATIC	WIRING DIAGRAM	INFO ONLY.			
0350-S-06	21 10954 2	CUBICLE		1	SHT/METAL	1.6THK CRCQ	
2721	2721 1	BRKT.	WALL MTG.	4	RSA.	38x38x3RSA x 50LG.	
		LOCK	CUBICLE DOOR	1	CHROME	LENLOCK TYPE LFL1	
		TAPE	DOOR SEAL	1	TYPE 404	BEAR FOAM 9x3.5THKx1260LG.	
		HINGES	CUBICLE DOOR	2	BUTT	LANE 51mm FIXED PIN.	
0350-S-09	23 10960 0	INT. LABEL	LOAD TERMINALS	1	GRAVOPLY	50x12x1.6THK.	
" " "	23 10959 0	" "	TERMINAL STRIP	1	"	62x10x1.6 THK.	
" " "	23 10958 0	" "	REGULATOR BY PASS	1	"	46x34x1.6 THK	
" " "	23 10957 0	" "	GENERATOR & BATTERY	1	"	136x16x1.6THK.	
0350-S-01		CIRCUIT	REGULATOR PCB 064	INFO ONLY.			
0350-S-05	11 10953 1	REGULATOR	PCB WD064	1	FIBREGLASS	LAMINEX 1oz 132x80x1.6THK	
0350-S-04	11 10952 2.	PCB	WD064 LAYOUT	INFO ONLY.			
3006	3006 9	SPACER	BAKELITE PANEL FIX'GS	4	MS Z.P.	3/16 BSW x 1 5/8 LG.	
		NUT	" " "	8	MS. Z.P	3/16 BSW HEX FULL	
		WASHER	" " "	8	M.S. ZP.	3/16 FLAT	
		WASHER	" " "	8	STL Z.P.	3/16" SPRING	
		WIRE	REGULATOR PCB	5	WHITE PVC	23/0076 x 250LG	
		WIRE	" "	3	" "	" " x 500LG	
		TERMINAL	5WAY	1	PVC	AMPERE 131P.	
		SCREW	TERMINAL BLOCK FIX'GS	2	BRASS	5/32 BSW x 1" LG. RD HD	
		WASHER	" " "	2	SP/STL	I.T. LOCK 5/32 I.D.	
		NUT	" " "	2	BRASS	5/32 BSW HALF - HEX	
		SCREWS	TERMINALS-GEN LOAD & BAT.	6	BRASS	1/4 BSW x 1 1/2 LG. RD HD	
		NUT	" " " "	24	BRASS	1/4 BSW HALF HEX	
		WASHER	" " " "	24	SP/STL	I.T. LOCK 1/4" I.D.	
		WASHER	" " " "	24	BRASS	1/4" FLAT	
		SADDLE	CABLE FIX'G.	1	PVC	CLIPSAL 5/8"-261	

DATE	10.10.78	21.2.79	15.3.79	19.3.79	28.5.79	1.6.79	4.7.79	27.8.79	31-7-79	17-10-79	13.11.79
ISSUE	1	2	3	4	5	6	7	8	9	10	11

ENG. N° 177 C/N 1915 · C/N 1928 C/N 1933 EN. 217 E.N. 218 EN. 224 C/N 1999 EN. 226 EN 238 C.N. 2049

DUNLITE

STANDARD BILL OF PARTS

SHEET 14 OF 16

PRODUCT NAME F55 WIND DRIVEN CUBICLE

MODEL Nº

DRAWING Nº	PART Nº	DESCRIPTION OF PART NAME	DESCRIPTION OF PART DETAILS	Nº OFF PER UNIT	MATERIAL REQUIRED TYPE	MATERIAL REQUIRED DESCRIPTION	SOURCE
		RESISTOR	PHILLIPS CR37 82k Ω.	1		CIRCUIT REF R1.	
		"	" " 5k6 Ω	1		" " R2	
		"	" " 12k Ω	1		" " R3	
		"	" " 270 Ω	1		" " R4	
		"	" " 1k Ω	4		" " R5-6-7-8	
		"	" CR52 47k Ω	1		" " R9	
		"	IRC 10WATT 20k Ω	1		" " R10	
		"	POTENTIOMETER 100k Ω	1	BUSH MTD SPECTROL OR BOURNS	" " RV1	
		"	63P 1kΩ	1		" " RV2	
		CAPACITOR	·1 μFD 341 SERIES CAP	1		" " C1	
		DIODE	EM404	2		" " D1 & D2	
		DIODE	A15D.	1		" " D3	
		TRANSISTOR	BF338	2		" " TR1 & TR4	
		"	BC547	2		" " TR2 & TR3	
		"	BDY94	1		" " TR5	
		RESISTOR	DUNLITE ·0043 Ω	1		CIRC REF R12	
0350-5-11	24 1103 2	"	" 93.4 Ω	1		" " R13	
704	B 704	BRKT	93.4 Ω RESISTOR	2	1·2TH" ZINC ANNEAL	SEE DRG.	
		SCREW	" " FIXGS.	4	BRASS	3/16 BSW x 3/4 LG. RD HD	
		NUT	" " "	4	"	3/16 BSW HEX.	
		WASHER	" " "	10	"	3/16 FLAT	
		"	" " "	8	STL.	3/16 I.T. LOCK WASHER	
		CABLE		2	PVC	RED 7/·052 x LG.	
		"		2	PVC	RED 7/029 x LG	
		LUG.	CABLE	4		UTILUX	
		"	"	4		UTILUX.	
		"	"	2		UTILUX	
		"	"	2		UTILUX.	
		"	"	2			
		WIRE		3	PVC	RED 23/0076 x LG	

DATE	10·10·78	21 2 79	15·3·79	19·3·79	28·5·79	1·6·79	4·7·79	27·8·79	31-7-79	17-10-79	13-11-79
ISSUE	1	2	3	4	5	6	7	8	9	10	11

ENG.W177 C/N1915 C/N1928 C/N1933 EN. 217 EN 218 E.N.224 C/N1999 EN. 226 EN. 238 C.N.2049

DUNLITE

STANDARD BILL OF PARTS

SHEET 15 OF 16

PRODUCT NAME F55 WIND DRIVEN CUBICLE

MODEL Nº

DRAWING Nº	PART Nº	NAME	DETAILS	Nº OFF PER UNIT	TYPE	DESCRIPTION	SOURCE
		SWITCH	TOGGLE - BOOST	1		ARROW MT300A	
		VOLTMETER	0-150v MODEL W4	1		UNI GRAHAM INSTRUMENTS	
		AMMETER	50-0-50 " "	1		" " "	
0006-L-175	23 10384 0	LOGO	DUNLITE	1	PVC	160mm SELF ADHESIVE	
0350-S-10	11 10961 1	HEAT SINK		1	ALUMINIUM	76 x 90 x 1·6 THK	
		DIODE	S6GN40	2		CIRC. REF D4 & D5	
C350-S-08	21 10956 1	PANEL	COMPONENT	1	BAKELITE	200 x 170 x 6·4 THK	
			P.C.B. MTGS. - LOCK SUPPORTS	4	PVC	LCBS-12N	
		SCREW	SADDLE FIXINGS	2	BRASS	5/32" BSW x 1/2" LG RD.HD	
		WASHER	" "	2	BRASS	5/32" FLAT	
		NUT	" "	2	BRASS	5/32" BSW HEX FULL	
		SCREW	HEAT SINK	2	MS. Z.P.	3/16" BSW x 5/8 LG RD.HD	
		WASHER	" " "	2	M.S. Z.P	3/16" FLAT	
		WASHER	" " "	2	STL.	I.T. LOCK 3/16 I.D.	
		NUT	" " "	2	M.S. Z.P.	3/16" BSW. HEX FULL	
		LOK-IN PINS	INT. LABEL FIX'GS	6	PVC	ROTEX [illegible] DIA x 1/4" LG	
		PAINT		AS REQD			

DATE	10·10·78	21·2·79	15·3·79	19·3·79	28·5·79	1·6·79	4·7·79	27·8·79	31·7·79	17·10·79	13·11·79
ISSUE	1	2	3	4	5	6	7	8	9	10	11
	EN 177	CN1915	CN1928	CN1933	EN. 217.	EN 218.	EN.224	CN1999	EN. 226	EN. 238.	C.N. 2049.

DUNLITE

STANDARD BILL OF PARTS

SHEET 16 OF 16

PRODUCT NAME F55 WIND DRIVEN CUBICLE

MODEL Nº