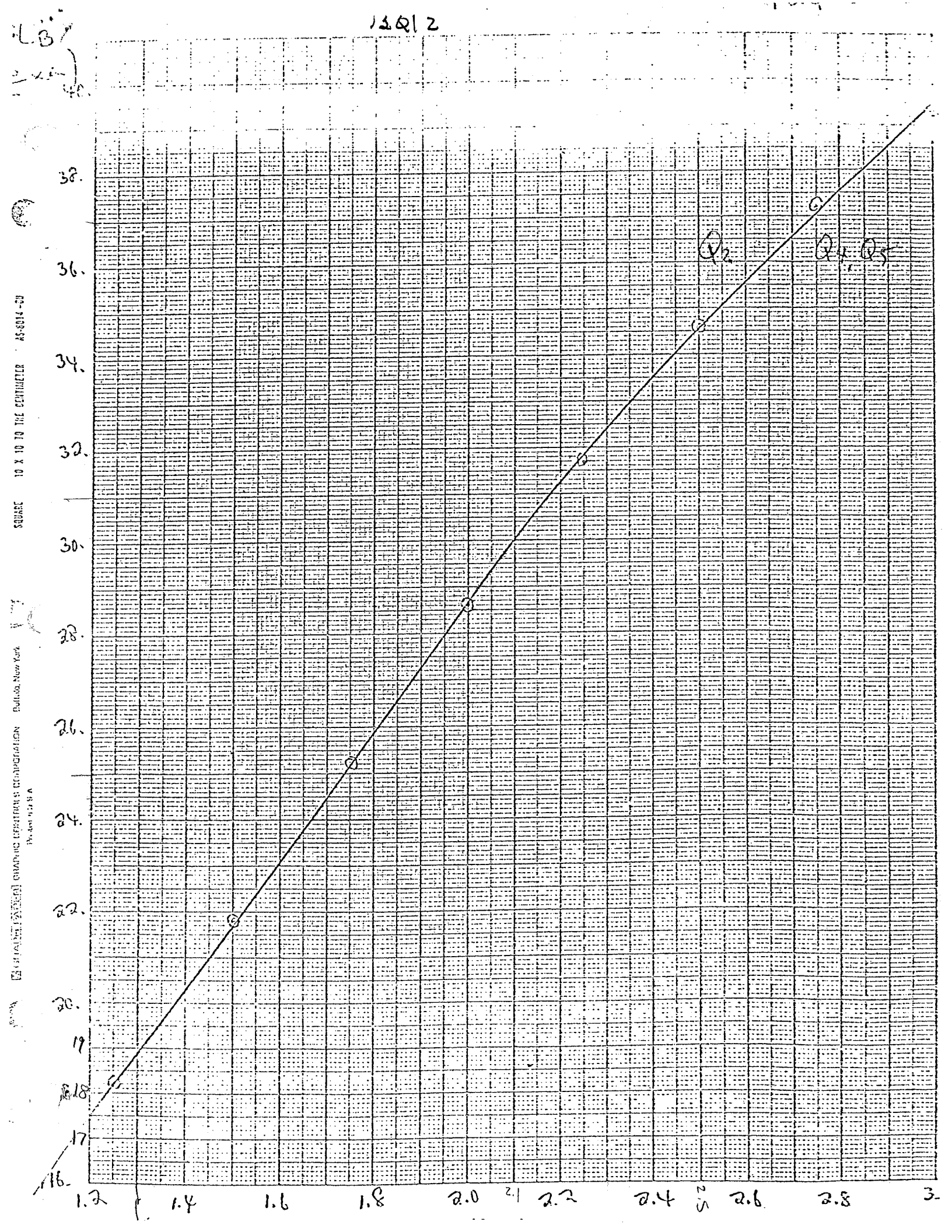
12 Φ x 12


1&Q12
38.
36.
34.
32.
30.
28.
26.
24.
22.
20.
19
18
17
16.
1.2
1.4
1.6
1.8
2.0
2.2
2.4
2.6
2.8
3.
Q2
Q4 Q5

# TEST DATA AND PROCEDURE
# FOR
# 12" X 12" QUADRUPOLE MAGNET

CATALYTIC CONSTRUCTION COMPANY
CONTRACT 40720-1600-201.1 S#2

NATIONAL AERONAUTICS & SPACE ADMINISTRATION
SPACE RADIATION EFFECTS LAB.
NEUTRON MASON PHASE III OF
600 MEV SYNCHROCYCLOTRON
LANGLEY STATION,
HAMPTON, VIRGINIA

P. O. #40720-1600-201.1 S#2

PACIFIC ELECTRIC MOTOR CO. JOB NO. S#3803

JUNE 1966

OAKLAND, CALIFORNIA

# QUADRUPOLE MAGNETS

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PACIFIC ELECTRIC MOTOR COMPANY

EPOXY MOLDING PROCEDURE FOR COILS - April 1966

1. Before molding coils, coils must be completely tested both electrically and hydraulically and pass all tests before proceeding with molding.

2. Coils to be molded must be thoroughly baked out approximately 2 - 4 hours at 250°F. in bake-out oven.

3. After coil is removed from bake-out oven, it must be allowed to cool to between 185°F. to 200°F. before placing in vacuum chamber.

4. Coil and casting mold are then placed in vacuum chamber. Chamber to be evacuated to 2 to 4 millimeters of mercury.

5. Mix epoxy resin and curing agent in proportions of 10 parts of 815 resin to 1 part curing agent D, by weight.

6. Epoxy resin and curing agent to be thoroughly mixed for a period of 15 minutes under vacuum of at least 2 millimeters of mercury.

7. After resin and curing agent are thoroughly mixed and de-gassed, mixture to be slowly admitted to casting mold in vacuum chamber.

8. Casting mold with epoxy to be held under continuous vacuum until de-aerated. After thoroughly de-aerating vacuum chamber may then be brought up to atmospheric pressure.

9. The mold with the coil and epoxy to be carefully removed from vacuum chamber for curing, making sure mold is not jiggled to trap any air bubbles.

10. Coil and mold are then placed in oven for curing at 185°F. for a period of 4 - 6 hours. Mold is then removed and allowed to cool to room temperature.

The above outlined technique is to apply to all coils for quadrupoles for Catalytic Construction Company, Contract No. 40720-1600-201.1 S#2.

By K. R. GERMANN

KRG/lg

PACIFIC ELECTRIC MOTOR COMPANY

QUADRUPOLE HYDRAULIC TEST DATA PAGE 1

12" APERTURE X 12" MAGNET NO. Q28X

I. FLOW PER MINUTE AT 125 PSI (MAX.)

COIL # A

| | lbs. - oz. | | | |
|---|---|---|---|---|
| Circuit 1 | 8 - 0 | = | .96 | GPM Lead |
| Circuit 2 | 11 - 4 | = | 1.35 | GPM |
| Circuit 3 | 11 - 4 | = | 1.35 | GPM |
| Circuit 4 | 11 - 4 | = | 1.35 | GPM |
| Circuit 5 | 11 - 4 | = | 1.35 | GPM |
| Circuit 6 | 11 - 4 | = | 1.35 | GPM |
| Circuit 7 | 11 - 4 | = | 1.35 | GPM |
| Circuit 8 | 8 - 8 | = | 1.02 | GPM |
| Circuit 9 | 10 - 8 | = | 1.26 | GPM Lead |

W.B.
5-17-66

COIL # B

| | | | | |
|---|---|---|---|---|
| Circuit 1 | 8 - 8 | = | 1.02 | GPM |
| Circuit 2 | 11 - 4 | = | 1.35 | GPM |
| Circuit 3 | 11 - 4 | = | 1.35 | GPM |
| Circuit 4 | 11 - 4 | = | 1.35 | GPM |
| Circuit 5 | 11 - 4 | = | 1.35 | GPM |
| Circuit 6 | 11 - 4 | = | 1.35 | GPM |
| Circuit 7 | 11 - 4 | = | 1.35 | GPM |
| Circuit 8 | 8 - 8 | = | 1.02 | GPM |
| Circuit 9 | 10 - 8 | = | 1.26 | GPM |

PACIFIC ELECTRIC MOTOR COMPANY

QUADRUPOLE HYDRAULIC TEST DATA PAGE 2

12" APERTURE X 12" MAGNET NO. Q28X

I. FLOW PER MINUTE AT 125 PSI (MAX.) (cont'd)

COIL # C

| | lbs. - oz. | | | |
|---|---|---|---|---|
| Circuit 1 | 8 - 4 | = | .99 | GPM |
| Circuit 2 | 11 - 4 | = | 1.35 | GPM |
| Circuit 3 | 11 - 4 | = | 1.35 | GPM |
| Circuit 4 | 10 - 8 | = | 1.26 | GPM |
| Circuit 5 | 11 - 4 | = | 1.35 | GPM |
| Circuit 6 | 11 - 4 | = | 1.35 | GPM |
| Circuit 7 | 11 - 4 | = | 1.35 | GPM |
| Circuit 8 | 8 - 4 | = | .99 | GPM |
| Circuit 9 | 10 - 8 | = | 1.26 | GPM |

W.B.
5-20-66

COIL # D

| | | | | |
|---|---|---|---|---|
| Circuit 1 | 7 - 15 | = | .95 | GPM |
| Circuit 2 | 11 - 2 | = | 1.33 | GPM |
| Circuit 3 | 11 - 6 | = | 1.36 | GPM |
| Circuit 4 | 11 - 0 | = | 1.32 | GPM |
| Circuit 5 | 10 - 15 | = | 1.21 | GPM |
| Circuit 6 | 11 - 0 | = | 1.32 | GPM |
| Circuit 7 | 11 - 0 | = | 1.32 | GPM |
| Circuit 8 | 8 - 8 | = | 1.02 | GPM |
| Circuit 9 | 11 - 0 | = | 1.32 | GPM |

H.S.
5-21-66

II. TOTAL FLOW ASSEMBLED MAGNET, PRESSURE 40 PSI, PER MINUTE =

149 LBS. 4 OZ. = 18 GPM.

PACIFIC ELECTRIC MOTOR COMPANY

QUADRUPOLE HYDRAULIC TEST DATA 

12" APERTURE X 12" MAGNET NO. Q28X

III. THERMAL CYCLING.

60°C. water (hot) for 5 min. followed by not over 20°C. water (cold) for 5 min. Repeat cycle three times.

1. Hot 60 °C. Time 5 Min. Cold 20 °C. Time 5 Min
2. Hot 60 °C. Time 5 Min. Cold 20 °C. Time 5 Min
3. Hot 60 °C. Time 5 Min. Cold 20 °C. Time 5 Min

IV. HYDROSTATIC TEST

Hydrostatic test at 50°F. - 70°F. and 250 psi for four (4) hours.

Pressure Start 265 PSI, Pressure Finish 255 PSI.

Time 4 hrs.

DATA TAKEN BY J.B. DATE 5-26-66
DATA CHECKED BY R.T. DATE 6-1-66
CATALYTIC CONSTRUCTION CO.
CONTRACT NO. 40720
JOB NO. S #3803

PACIFIC ELECTRIC MOTOR COMPANY

QUADRUPOLE

MECHANICAL
TEST DATA

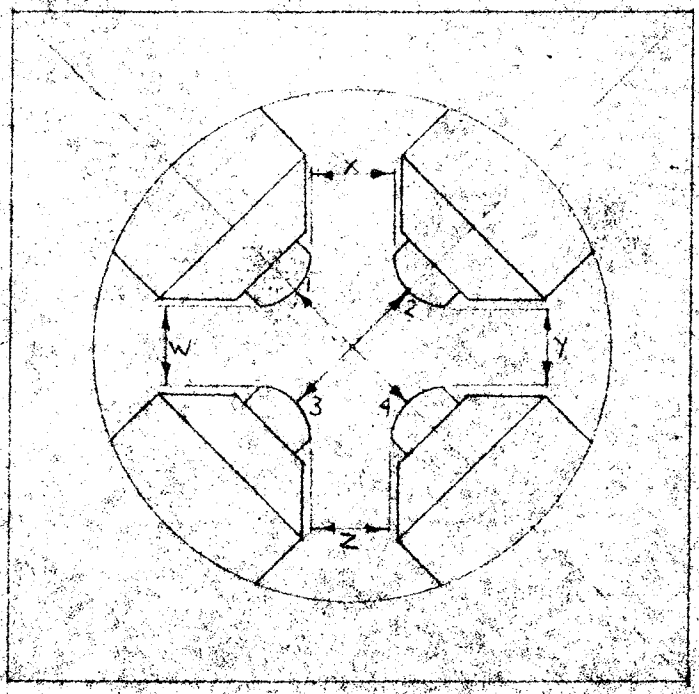
12 " APERTURE X 12 " MAGNET NO. Q28X

AIR GAP

| FRONT (Coil Term. End) | | REAR | |
|---|---|---|---|
| 1 to 4 | 12.0525 | 1 to 4 | 12.0520 |
| 2 to 3 | 12.0535 | 2 to 3 | 12.0525 |

POLE TIP CORNERS

| FRONT | | REAR | |
|---|---|---|---|
| W | 4.671 | W | 4.677 |
| X | 4.680 | X | 4.678 |
| Y | 4.690 | Y | 4.680 |
| Z | 4.678 | Z | 4.690 |




FRONT
(COIL TERMINAL END)

DATE 5-20-66

DATA TAKEN BY:
G.S.

DATA CHECKED BY:
K.G.

CONTRACT NO. 40720

CUSTOMER Catalytic Construct. Co.

JOB NO. S #3803

PACIFIC ELECTRIC MOTOR COMPANY

QUADRUPOLE ELECTRIC TEST DATA PAGE 1

12" APERTURE X 12" MAGNET NO. Q28X

I. IMPULSE COILS AT 3000 VOLTS: AND COIL RESISTANCE CHECK.

COIL #A
Checked by J.B. Date 5-18-66
COIL #A (Opposite Terminal)
Checked by J.B. Date 5-18-66

Resistance .060 By J.B. Date 5-27-66
Temperature 18°C. By " Date "
Corrected Resistance to 60°C. _____ By _____

COIL #B
Checked by J.B. Date 5-19-66
COIL #B (Opposite Terminal)
Checked by J.B. Date 5-19-66

Resistance .060 By J.B. Date 5-27-66
Temperature 18°C. By " Date "
Corrected Resistance to 60°C. _____ By _____

COIL #C
Checked by J.B. Date 5-20-66
COIL #C (Opposite Terminal)
Checked by J.B. Date 5-20-66

Resistance .060 By J.B. Date 5-27-66
Temperature 18°C. By " Date "
Corrected Resistance to 60°C. _____ By _____

COIL #D
Checked by J.B. Date 5-21-66
COIL #D (Opposite Terminal)
Checked by J.B. Date 5-21-66

Resistance .060 By J.B. Date 5-27-66
Temperature 18°C. By " Date "
Corrected Resistance to 60°C. _____ By _____

II. 2200 VOLT D.C. TEST TO GROUND/1 MIN. AFTER FINAL ASSEMBLY.
CHECKED BY J.B. DATE 5-27-66

PACIFIC ELECTRIC MOTOR COMPANY

QUADRUPOLE ELECTRIC TEST DATA 

12" APERTURE X 12" MAGNET NO. Q28 X

III. TOTAL RESISTANCE OF ASSEMBLED MAGNET.
(Measured across power terminals)

RESISTANCE .240 BY J.B. DATE 5-31-66

TEMPERATURE 18°C. BY J.B. DATE 5-31-66

CORRECTED RESISTANCE TO 60° .280 BY P.T.

RESISTANCE MEASURED WITH LEEDS AND NORTHRUP TESTING SET NO. 5300.

DATA CHECK BY R.T. DATE 6-2-66

CATALYTIC CONSTRUCTION CO.

CONTRACT NO. 40720

JOB NO. S #3803

PACIFIC ELECTRIC MOTOR COMPANY

GAUSSMETER CALIBRATION CHECK

BY N.M.R.

| | | | |
|---|---|---|---|
| HI | RANGE | QRC-75-5 | POWER SUPPLY |
| 37 | NMR DIAL | PEM-Test | MAGNET |
| #1 | PROBE | 3/4" | GAP |
| Short | EXTENSION | 170 | AMPS. |

10,50 KG FIELD MEASURED WITH RAWSON-LUSH METER

SERIAL NO. 13466 .

4.26 X 10.50 KG = 44.8 MC RESONANT FREQ.

| F.M. DIAL READING | BASIC FREQ. | HARMONIC | FREQ. (MC) | FIELD (KG) |
|---|---|---|---|---|
| 3516.7 | 3.536 | X 13 | 45.968 | 10.78 |
| 4084.7 | 3.831 | X 12 | 45.972 | |

CORRECTION FACTOR FOR RAWSON-LUSH GAUSSMETER

MULTIPLY BY 1.027

DATE CHECKED 5/13/66

CHECKED BY K.C.

CATALYTIC CONSTRUCTION CO.
CONTRACT NO. 40720