

CONTINENTAL AIRCRAFT ENGINE CO
DETROIT MICHIGAN

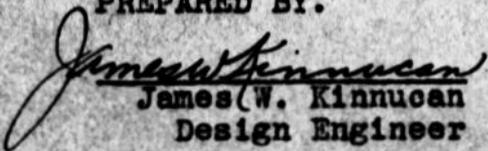
DESIGN REPORT No. 54
Date March 6, 1934

2-SHEETS

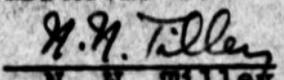
CURVES C-6 TO C-12

CONTINENTAL O-1430-1 ENGINE
VALVE TIMING, OPENING AREAS, VELOCITY,
ACCELERATION, AND FORCE DUE TO ACCELERATION

PREPARED BY.

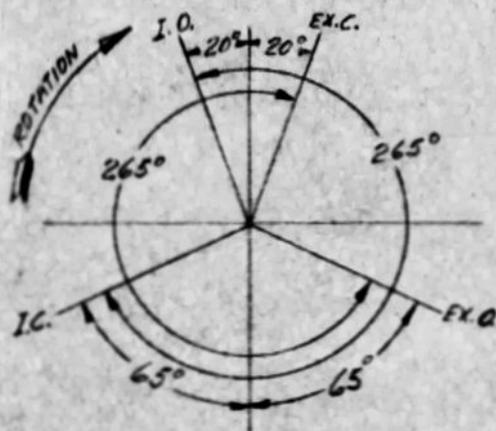

James W. Kinnucan
Design Engineer

APPROVED BY.


N. N. Tilley
Chief Engineer

Valve timing, opening areas, velocity, acceleration and force due to acceleration.

References: "Mechanism" By S. Dunckerley A.S.I.C. No. 421



Valve Timing.

I.O. (Intake opens)	20°	Early
I.C. (Intake closes)	65°	Late
EX.O. (Exhaust opens)	65°	Early
EX.C. (Exhaust closes)	20°	Late

CAMS

The exhaust and intake cams are alike, and are shown on the accompanying sketch of the general arrangement. The cam contour is of the hollow face type, having a ramp which will give the valve a constant seating velocity of 2ft. per. second. at 3000 R.P.M. of engine.

The valve opening areas are shown on the accompanying curves plotted against both piston travel and crank angle. The maximum lift of both the intake and exhaust valves is the same, namely .562 in. The diameter of the intake port is 2.437 giving a maximum opening area of 4.16 sq. in. The diameter of the exhaust port is 2.125 giving a maximum opening area of 3.62 sq. in.

The velocity, acceleration and force due to acceleration for the Hyper No. 2 valves and the 12 cyl. engine valves are shown in the accompanying curves.

COMPARATIVE VALUES

	V-1570 @2450 RPM.	Hyper No.2 @3000 RPM	Hyper 2A 440 0-1430-1 @3000 RPM
Max: velocity of valve	10.4 ft/sec.	11.5 ft/sec.	11.3 ft/sec.
Max. acceleration	5050 ft/sec.	10,025 ft/sec.	8100 ft/sec.
Max. force on cam	247.5 lbs.	992 lbs.	812 lbs.
Max. spring load	91 lbs.	200 lbs.	200 lbs.
Excess spring load	10.5 lbs.	58 lbs.	65 lbs.

NOTE: This report is preliminary, representing the design as of the report date. changes will undoubtedly be made progressively. Final calculations and data will be contained in a complete report, of later date

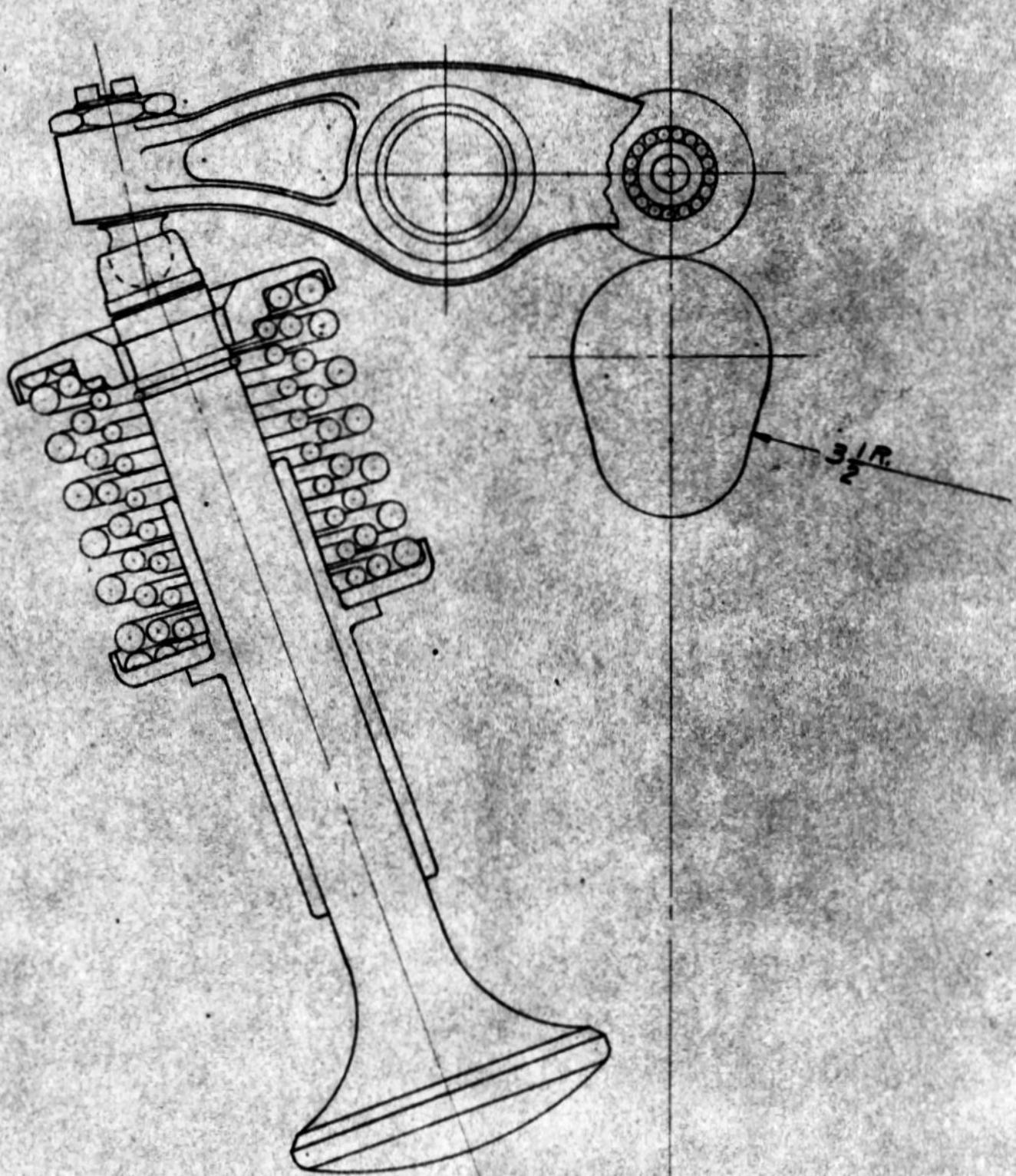


FIG 1

TYPICAL VALVE ARRANGEMENT
CONTINENTAL O-1430-2 ENGINE



0-7

VALVE OPENING AREA, SQUARE INCHES

120 130 140 160 200 240 260 280 290 300 310 320 330 340 0 20

CRANK ANGLE, DEGREE

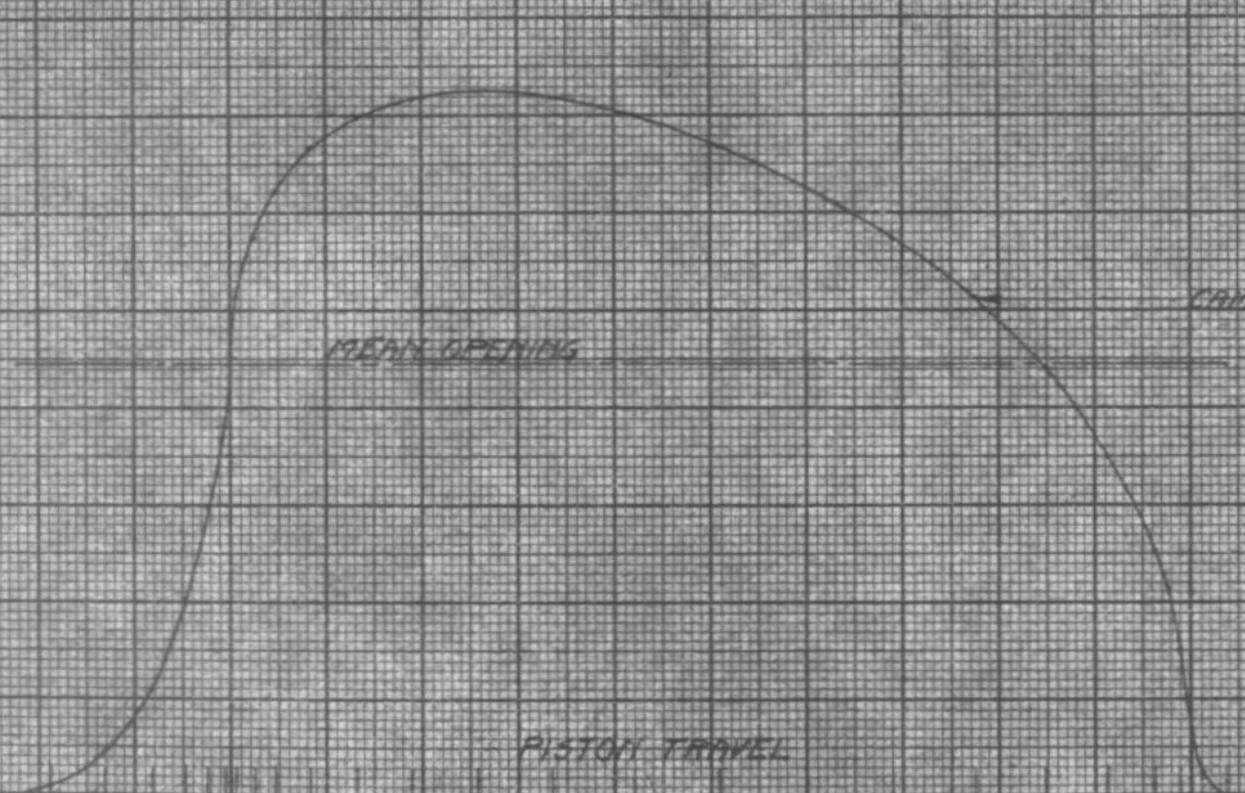
PISTON TRAVEL

MEAN OPENING

CAM DESIGN NO. 1

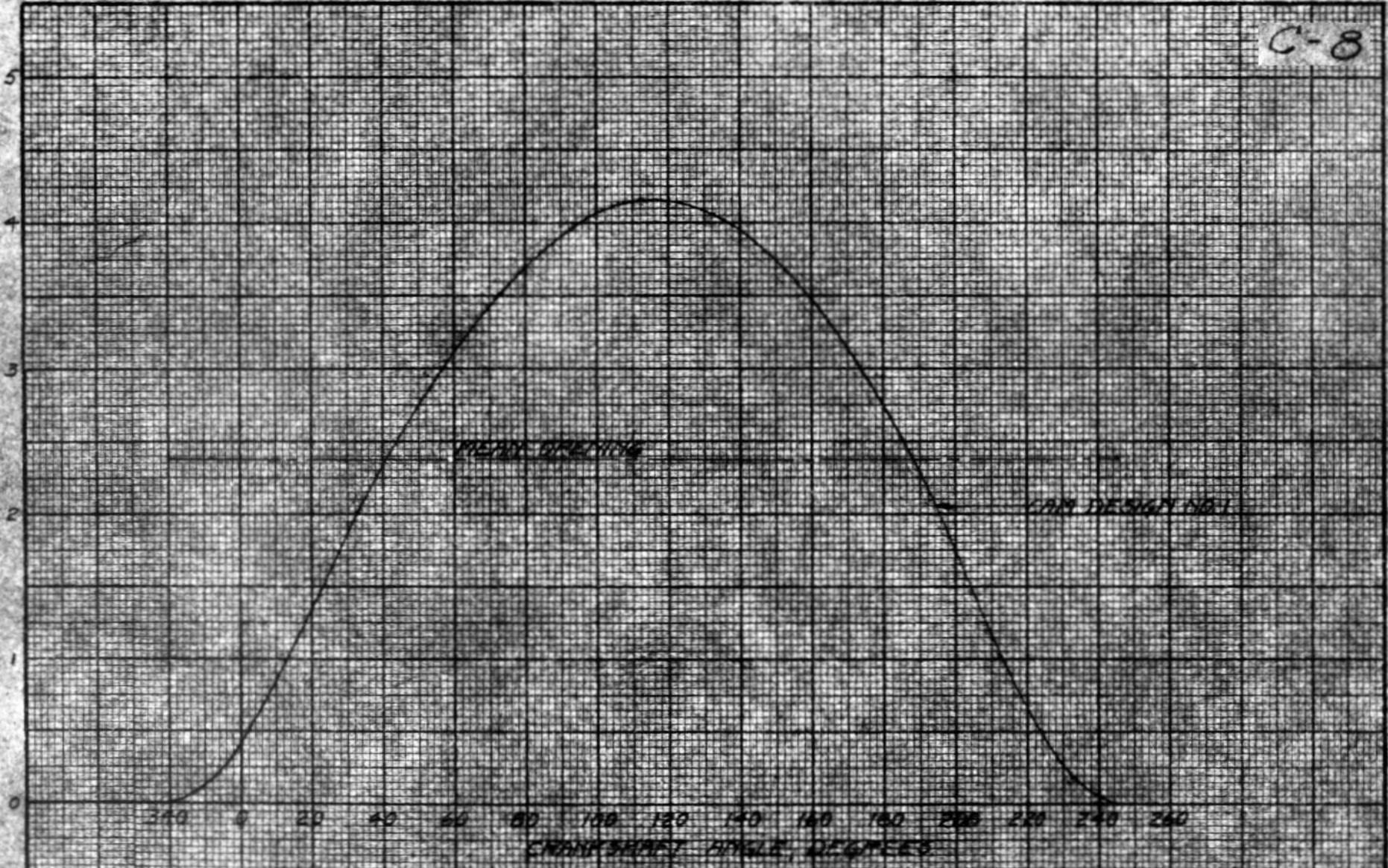
EXHAUST OPENING AREA
CONTINENTAL D-1430-1 ENGINE

DEC 8 - 1933
Ford



C-8

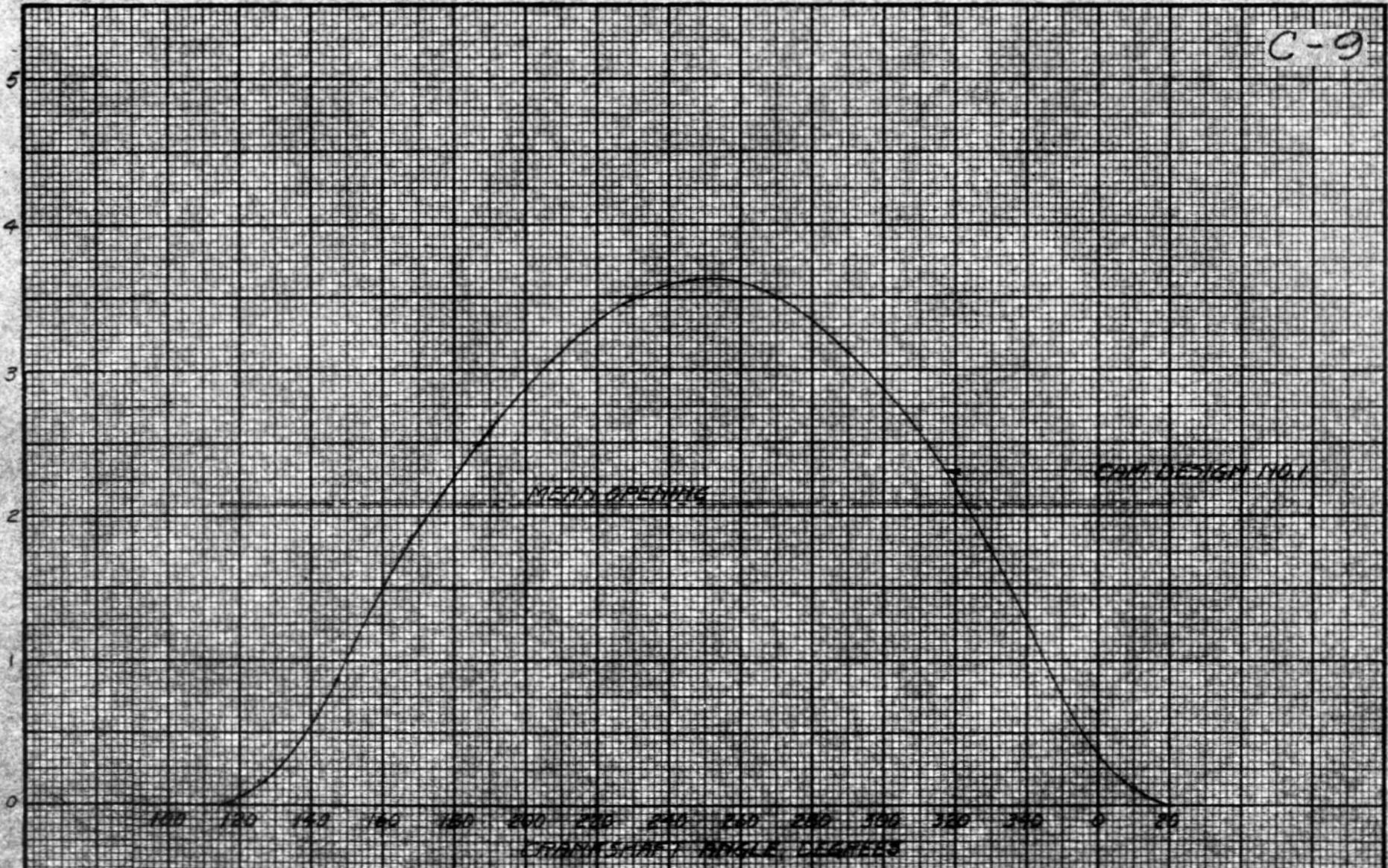
VALVE OPENING AREA, SQUARE INCHES.



INTAKE OPENING AREA
CONTINENTAL O-200 ENGINE

DEC. 7, 1953
P. H. H.

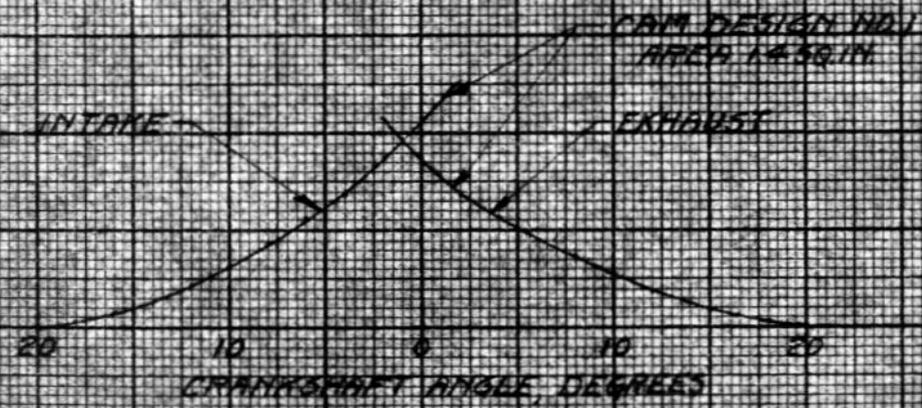
VALVE OPENING AREA, SQUARE INCHES



EXHAUST OPENING AREA
CONTINENTAL D-1200 ENGINE

DEC 7-1933
H. G. G.

VALVE OPENING AREA, SQUARE INCHES



INTAKE & EXHAUST OPENING AREA OVERLAP
CONTINENTAL OM 1300 ENGINE

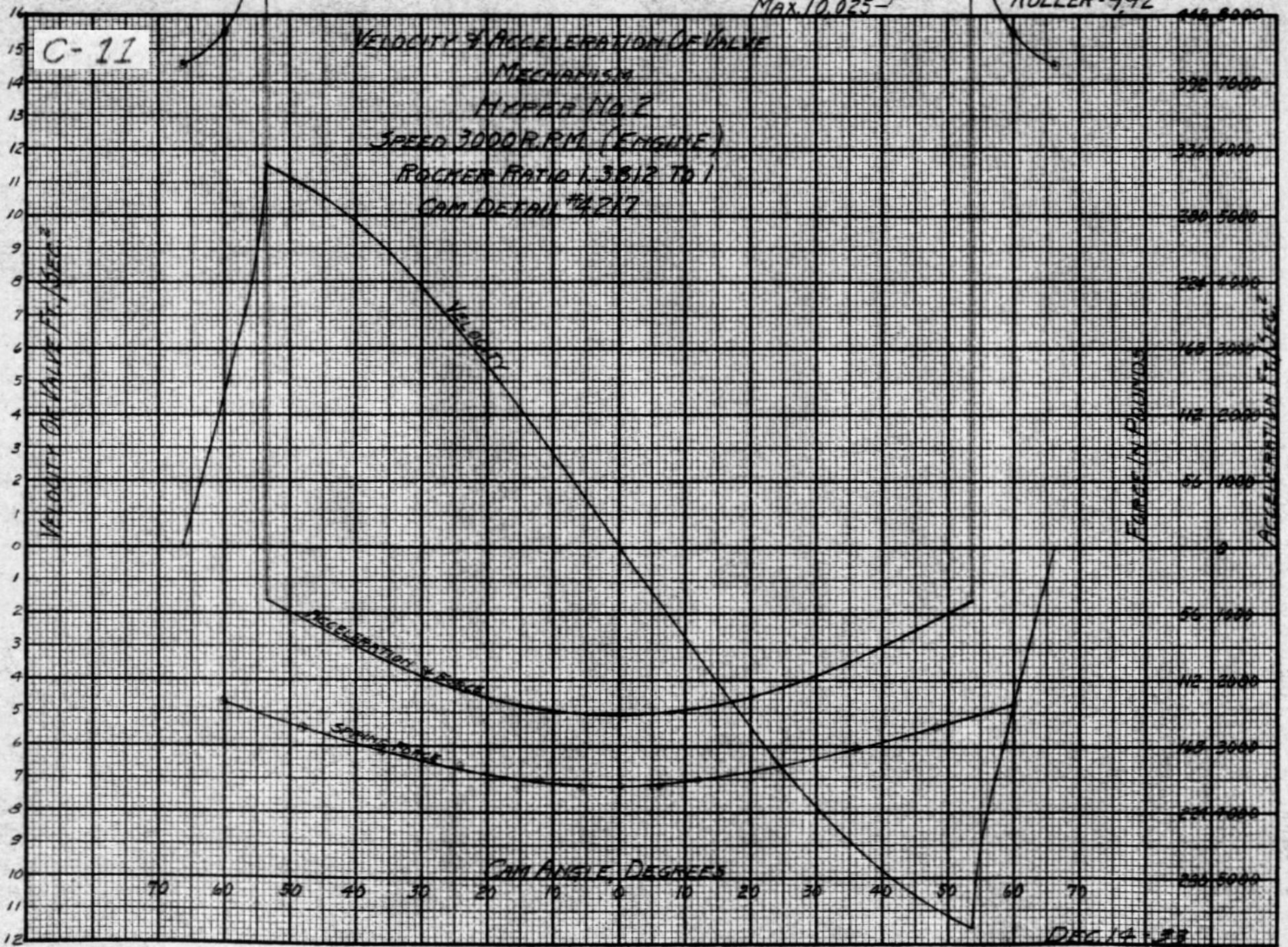
DEC 7-1933
R. H. H.

MAX. FORCE ON
ROLLER-992#

MAX. 10,025-

C-11

VELOCITY & ACCELERATION OF VALVE
MECHANISM
HYPER NO. 2
SPEED 3000 R.P.M. (ENGINE)
ROCKER RATIO 1.3812 TO 1
CAM DETAIL #4217



DEC 14 1933

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C-12

VELOCITY & ACCELERATION OF VALVE
 MECHANISM
 CONTINENTAL C-1430 ENGINE CAM #1
 SPEED 3000 P.P.M. (ENGINE)
 ROCKER RATIO 1.3835 TO 1
 CAM DETAIL #4226 HYPER 7A

MAX. FORCE ON
FOLLER = 312 #

145 0000
 335 7000
 335 6000
 275 5000
 220 4000
 165 3000
 110 2000
 55 1000
 0
 55 1000
 110 2000
 165 3000
 220 4000
 275 5000

VELOCITY OF VALVE FT./SEC.

FORCE IN POUNDS

ACCELERATION FT./SEC.

VELOCITY

ACCELERATION & FORCE

SPRING FORCE

CAM ANGLE DEGREES

DEC 14 - 33

JWK

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