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SUMMARY

The results of wind tunnel tests on a rudder operating downstream of a propeller are presented. The experiments simulated the condition of a rudder operating in the proximity of a propeller but without the influence of the hull.

The tests were carried out in the 3.5m x 2.5m wind tunnel at the University of Southampton and form an extension to the basic rudder-propeller tests which have already been carried out and are reported on elsewhere. The rudders tested were all movable, and the propeller used in the tests was modelled on a Wageningen B4.40.

Tests were carried out with positive and negative wind speed and positive and negative propeller revolutions in order to simulate all the four quadrants of operation. These tests also included the case of zero and low wind speed.

Results are presented as rudder lift, drag and moment coefficients and centre of pressure for selected angles of attack and changes in propeller thrust loading. Surface pressure distributions over the rudder were also obtained in selected cases in order to provide a detailed knowledge of the distribution of forces over the rudder.

The results provide rudder force data for use in manoeuvring simulations and detailed data for the validation of numerical modelling of the interaction problem.

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NOMENCLATURE

The notation of angles and forces is further depicted in Fig. 3.

A	Rudder Area (S.c)
AR_G	Geometric aspect ratio
c	Rudder chord
D	Propeller Diameter
CP_c	Centre of pressure chordwise, %c, measured from leading edge
CP_s	Centre of pressure spanwise, %s, measured from root
C_D	Drag coefficient ($d/\frac{1}{2}\rho AV^2$)
C_D'	Drag coefficient ($d/\frac{1}{2}\rho AK_T n^2D^2$)
C_L	Lift coefficient ($L/\frac{1}{2}\rho AV^2$)
C_L'	Lift coefficient ($L/\frac{1}{2}\rho AK_T n^2D^2$)
C_n	Normal force coefficient, normal to rudder per unit span
C_T^*	Propeller thrust coefficient ($8T/\rho\pi D^2[V^2+(0.7\pi nD)^2]$)
C_Q^*	Propeller torque coefficient ($8T/\rho\pi D^2[V^2+(0.7\pi nD)^2]$)
d	Rudder drag force, body (ship) axis
L	Rudder lift force, normal to body (ship) axis
N	Normal force, normal to centreline of rudder
n	Propeller revs per sec
V	Wind speed (free-stream)
Q	Propeller torque
T	Propeller thrust
J	Propeller advance coefficient (V/nD)
K_T	Propeller thrust coefficient ($T/\rho n^2D^4$)
K_Q	Propeller torque coefficient ($Q/\rho n^2D^5$)
S	Rudder span
t	Rudder section thickness
X	Longitudinal distance, propeller plane to rudder leading edge in line with propeller axis
Y	Lateral distance between propeller axis and rudder stock
Z	Vertical distance between rudder root and propeller axis
ψ	Propeller advance angle ($\tan^{-1}[J/0.7\pi]$)
α	Rudder angle relative to body (ship) axis
ρ	Mass density

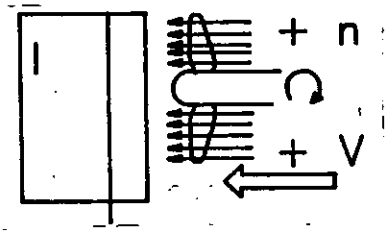
1. INTRODUCTION

This report presents results from a detailed wind tunnel investigation into the performance of a ship rudder working in the proximity of propeller. Details of previous test results are reported in Refs 1, 2, 3 and 4.

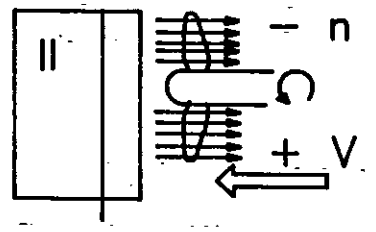
A comprehensive presentation is made of the results obtained in two weeks of wind tunnel testing carried out in July 1992 and one week in still air in a laboratory in September 1992. Section 2 details the rudder and propeller models used. The test rig and the tests carried out are described in Sections 3 and 4. Sections 5 and 6 detail respectively the data reduction and its presentation. Section 7 discusses the results obtained. Conclusions and recommendations drawn from the test results are presented as Section 8.

Tests are reported for the four quadrants of ship operation. These are defined as (where V is ship velocity and n propeller rate of revolution):

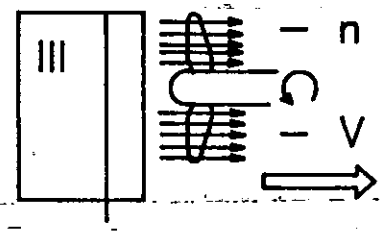
Quadrant I: Ship ahead, propeller ahead (+ V, + n)



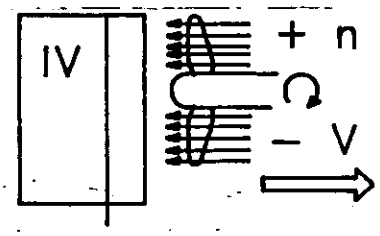
Quadrant II: Ship ahead, propeller astern (+ V, - n)



Quadrant III: Ship astern, propeller astern (- V, - n)



Quadrant IV: Ship astern, propeller ahead (+ V, - n)



2. DESCRIPTION OF MODELS

2.1 Rudders

For these tests two rectangular rudders were used, designated Rudder No. 2 and Rudder No. 3 (using the same designations as in Refs. 1-4). These rudders have a chord of 667m, a NACA 0020 section, and spans of 1000mm and 1200mm respectively. A detailed description of the method of manufacture of the rudder models is given in Ref. 5. Table I presents the particulars of the rudders used in the current investigation and Fig. 1 their overall dimensions. The rudders had pressure tappings to give complete coverage of the rudder surface, as detailed in Fig. 1. The manufacturing technique for the pressure tappings is outlined in Ref. 2.

For the tests carried out, the rudders had a roughness strip attached with its leading edge 5.7% chord from the leading edge of the chord on both sides of the rudder. The roughness strips were manufactured from 12mm wide double-sided tape densely covered with 100 grade carborundum grit (0.15mm diameter).

2.2 Propeller

A representative propeller design, based on the Wageningen B4.40 was used. The propeller has four blades, a diameter of 800mm and a blade area ratio of 0.40. Modifications made to the basic Wageningen design are detailed in Ref. 6 and consisted of altering the blade root shape to allow an adjustable pitch design with four separate blades and a split hub, removing rake and decreasing blade sweep to reduce centripetal loading moments at the root, and increasing the hub/diameter ratio from 0.167 to 0.25. Overall propeller details are summarised in Table II.

The split hub was manufactured from aluminium alloy and a positive clamping action allows the four blades to be rotated to the desired pitch ratio setting. The four blades were manufactured using hybrid carbon/glass fibre laid up in the same split female mould to produce identical blades. The production of the composite blades is detailed in Ref. 7 and the machining of the split female mould in Ref. 6. In appearance the hub/blade root region is very similar to that of a typical controllable pitch propeller.

3. APPARATUS

3.1 General

The majority of the tests were carried out in the 3.5m x 2.5m low-speed wind tunnel at the University of Southampton. The zero wind speed tests were conducted in a laboratory. The overall rig for testing the interaction of ship rudders and propellers is shown in Fig. 2. The rig consists of two independent units which allow free-stream (open-water) tests to be carried out independently on rudders and propellers as well as the investigation of their interaction.

3.2 Rudder Rig/Dynamometer

The rig consists of a cast steel pedestal attached to the floor and a welded steel extension which supports a five-component strain gauge dynamometer below the tunnel working section. A description of the design and calibration of the dynamometer is given in Ref. 8. The rudder is bolted directly to the dynamometer. The dynamometer is levelled and adjusted vertically so that there is a small gap of approximately 2.5mm (0.004c) between the rudder root and the floor of the tunnel working section.

3.3 Propeller Rig

Full details of the propeller rig are given in Ref. 5. The rig is designed in such a way that the propeller can be adjusted vertically, longitudinally and at an angle of attack to the flow if required. The tests reported on were carried out with the propeller's axis of rotation 600mm above the wind tunnel floor. The propeller rotates anti-clockwise when viewed from aft (looking upstream).

An in-line strain gauge dynamometer mounted close to the propeller measures the delivered thrust and torque. The design and static calibration of this dynamometer is detailed in Ref. 9. The two measurement components of the dynamometer are connected via a slip-ring assembly to Fylde Bridge balance units with a built in stabilised power supply. The bridge balance output voltage is measured directly (without amplification) using a Schlumberger Minate Digital Voltmeter.

A variable frequency inverter is used to control the 30kw electric drive motor and the propeller rpm can be continuously varied in small discrete steps between 0 and 3000 rpm. An optical shaft encoder was used to measure propeller revolutions and gives a voltage proportional to shaft rpm.

3.4 Data Acquisition System

The large number of individual data readings required the use of an automated system for data acquisition. Bridge output signals from the five-component rudder dynamometer, the rudder pressure transducers and the propeller thrust/torque dynamometer are measured using a digital voltmeter. The voltmeter and input channels, together with the measurement of revolutions rate, are controlled by software running on an RM personal computer and the results stored on floppy discs for subsequent analysis. More details of the data acquisition system are provided in Refs. 1 and 2.

4. TESTS

4.1 Propeller free-stream (open water) tests

Propeller open water tests were carried out at a mean pitch ratio of 0.95 over a range of positive and negative revolutions for wind speeds of 10 m/s and 20 m/s whereby the four quadrants of operation were covered. Propeller thrust and torque were recorded for all combinations of wind speed and revolutions. As discussed in Ref. 2, the combination of

propeller characteristics and chosen rpm would generally avoid any propeller scaling problems.

4.2 Rudder free-stream (forward and reverse flow)

The propeller rig was removed from the wind tunnel to allow testing of the model rudder in the free-stream (forward or ahead) condition for wind speeds of 10m/s and 20m/s. Rudder incidence was varied up to a maximum incidence of 70^{o}. During tests of the rudder-propeller combination in quadrants 3 and 4 the positions of the propeller and rudder rig were reversed to simulate a vessel moving astern. This allowed measurements to be made of the reverse flow performance of the rudder in a nominal free-stream (propeller stationary). This was carried out for wind speeds of 10m/s and 20m/s for rudder incidence up to 40^{o}.

4.3 Four Quadrant Rudder-Propeller Interaction

The rudder-propeller combination, using Rudder No. 2, was tested in four quadrants of operation using a mean propeller pitch ratio of 0.95. One longitudinal separation with an X/D corresponding to 0.39 was used for these four quadrant tests. A wind speed of 10 m/s was used and propeller revolutions up to ± 2100 rpm. In two cases (negative revs with positive speed and positive revs with negative speed) revolutions were limited due to vibration in the rig emanating from the complicated flow under these particular conditions. Wind speed was set using the wind tunnel speed controller and measured using a Betz manometer. For given propeller revolutions the wind speed controller was varied as necessary to compensate for the wind speed imparted by the propeller. Based on a free-stream velocity of 10 m/s and rudder chord, the nominal Reynolds Number in the ahead condition was 0.4×10^{6} whilst velocities induced by the propeller at the higher thrust loadings led to effective Reynolds Numbers of up to 1×10^{6} over much of the rudder. Rudder force and surface pressure measurements were made over a range of rudder angle of attack of $\pm 30^{\circ}$. The range of rudder force measurements was extended to -35° and $+40^{\circ}$ to include stall where possible.

In quadrants 3 and 4 where the flow direction is reversed to simulate a vessel moving astern the layout of the rudder-propeller rig was reversed within the wind tunnel.

4.4 Rudder-propeller interaction at low advance ratio

Tests were carried out in the wind tunnel with the fan stationary to simulate the bollard pull condition ($J=0$). The flow induced by the propeller drove the tunnel flow at a slow but measurable speed. The steady-state wind speed imparted by the propeller to the air in the tunnel was measured using a Betz manometer connected to the tunnel pitot-static tube upstream of the rudder-propeller rig. It should be noted that velocities induced by the propeller at the higher revs. led to effective Reynolds Numbers of up to 0.75×10^{6} over much of the rudder. Results presented in Ref. 10 indicate that tests at these conditions should preclude any significant scale effect. The test procedure and results obtained from a preliminary study are described in Ref. 11.

Measurements were made for Rudder No. 2 at propeller revolutions of 800 and 1460 rpm. The wind speed imparted by the propeller was not sensitive to rudder incidence and

was proportional to the rate of revolution of the propeller. The actual advance ratio J for each value of revs. was found to be 0.17 corresponding to an open-water thrust loading (K_T/J^2) of 12.

Rudder and propeller force measurements were carried out over a range of incidences between -35^o and 40^o to include stall were possible.

4.5 Rudder-propeller interaction at zero advance ratio

The rudder-propeller combination was assembled in a laboratory to simulate a true bollard pull (J=0) condition. The arrangement of rudder and propeller models and floor boards was identical to those used in the wind tunnel tests.

Tests in the zero wind speed condition were carried out for Rudder No. 2. In this case longitudinal separations X/D of 0.30, 0.39 and 0.52 and lateral separations Y/D of 0, +0.25 and -0.125 were tested. Nominal propeller revolutions of 750 and 1400 rpm were tested in each case, together with a limited investigation of the influence of negative revolutions. The effect of aspect ratio was also tested by comparing the performance of all-movable Rudder No. 3 at an X/D=0.39 and at a propeller speed of revolutions of 1160rpm with that of Rudder No. 2.

5 DATA REDUCTION AND CORRECTIONS

A computer program, described in Ref. 1, was used to provide the data in coefficient form. The program incorporates the rudder dynamometer five-component interaction matrix and correction formulae and the resolution of forces and moments from instrument axes to stream axes as necessary. A cross plot of raw rudder data yielded the angular misalignment of the rudder rig for Quadrants I and II to be less than 0.40°, and this correction was applied to all measured angles before insertion in the program. No alignment angle correction was made for the reversed rig (Quadrants III and IV).

The acquisition of rudder surface pressures, together with reference static and dynamic pressures from the tunnel, allowed direct calculation of the local static pressure coefficient Cp. Chordwise integration of Cp is carried out to give the normal force coefficient C_n for each span position.

The analysis program incorporates the propeller dynamometer calibrations hence allowing direct calculation of the propeller coefficients.

Tunnel boundary corrections were investigated but found to be unnecessary, as effects such as tunnel blockage for the 3.5m x 2.5m working section were found to have a negligible effect for the rudder size and propeller diameter tested.

6. PRESENTATION OF DATA

The notation of rudder incidence α and coefficients used in the presentation, is given in Fig. 3, noting that the propeller rotates in an anti-clockwise direction when viewed from aft. Forces and moments for all four quadrants of operation are specified with respect to an equivalent ship axis system. That is, a system fixed with respect to the rudder and propeller rig and not the wind tunnel.

For forward and astern ship motion in the four quadrants of operation the rudder forces are non-dimensionalised using the wake (or free-stream) velocity of 10 m/s. It is considered that the free stream velocity provides the best physical representation, showing an increase in rudder forces with increase in propeller thrust loading, and tending to the free-stream results as revolutions and propeller thrust loading tend to zero. Thus in this case rudder lift and drag are non-dimensionalised using $\frac{1}{2}\rho AV^2$.

The case when ship speed is at or near zero, where propeller induced velocities dominate, is treated as a separate domain. In this case, rudder forces are non-dimensionalised using $K_T n^2 D^2$, a function of the theoretical prediction of propeller induced velocities at zero J $(K_T n^2 D^2 8/\pi)^{0.5}$. Thus in this case rudder lift and drag are non-dimensionalised using $\frac{1}{2}\rho A K_T n^2 D^2$. It will be demonstrated later in the discussion of the experimental results that these two presentations merge satisfactorily at low J values.

It is apparent that a number of plausible possibilities exist for the presentation of the data, including the use of $V^2 (1+C_T)$, n^2D^4 for low/zero speed work and $(V^2 + (0.7\pi nD)^2)$ which would cover all quadrants and transitions between quadrants. None would appear to have a universal application and include a satisfactory physical representation. This accounts for the decision to present the data in two forms, the one when the ship has forward or astern speed and the other when the ship is at or close to zero speed.

A wider discussion of the presentation of rudder force data in the presence of a propeller is given in the reply to the discussion of Ref. 3.

The choice of parameter for representing the propeller thrust loading is also not clear cut when the four quadrants of operation and transition areas are to be considered. K_T/J^2 has been used successfully by a number of investigators for the first quadrant, but it is not satisfactory through the transitions from quadrant to quadrant. If the quadrant of operation is defined J can be used, although it is propeller pitch specific. Propeller advance angle ψ does cover all quadrants but again in pitch specific. The use of C_T* as adopted in propeller four-quadrant work (Ref. 12) would seem equally applicable to rudder work, assuming the quadrant of operation is defined by the use of ψ.

In the current work the alternative forms of presentation of thrust loading are provided by way of a tabulation of the test revs, J and K_T/J^2 where appropriate, C_T* and ψ which allows identification of the quadrant of operation. The tabulation of these values for the various test cases is shown in Table III.

The results of the tests are presented graphically and also tabulated as a series of appendices. Appendices A and B list the rudder and propeller force data respectively. The

distribution of local sectional force data is given in Appendix C. Appendix D gives all the rudder surface data pressure in coefficient form.

The four quadrant propeller free stream (open water) characteristics are given in Figs. 4 (C_T*) and 5 (C_Q*). The data for the four quadrants are presented in terms of C_T*,C_Q* against ψ along the lines of that used in Ref. 12.

Figs. 6 and 7 present the free-stream performance of Rudder No. 2 in forward and reverse flow. The plot shows the variation of rudder sideforce, drag and chordwise and spanwise centre of pressure against a base of rudder incidence. This form of presentation is subsequently referred to as a performance plot. The chordwise centre of pressure is defined as a percentage of the rudder chord from leading edge and spanwise centre of pressure spanwise as a percentage of span from the rudder root.

Figure 8 is a performance plot of Rudder No. 2 for three different propeller advance ratios for rudder incidence in the range -70^o to $+70^o$ for first quadrant operation.

Figures 9 to 13 consist of four separate plots, one for each quadrant of operation. These show the variation against a base of rudder incidence of rudder sideforce C_L(Fig. 9), rudder drag C_D(Fig. 10), rudder torque C_{Mz}(Fig. 11), rudder bending moments C_{Mx} (Fig. 12) and CM_y (Fig. 13). For each quadrant for which results are shown, a range of propeller revolutions was tested for a constant wind speed of 10m/s. In addition, for the 1st and 2nd Quadrants, results are shown for two different propeller revolutions at a wind speed of 20m/s.

The data are presented in terms of revs rather than directly as thrust loading, for the reasons mentioned earlier, and Table III provides the thrust loading (in its various forms) for the tests in the different quadrants of operation.

In Fig. 14 the variation of rudder sideforce (C_L) at $+10^o$ against propeller advance angle is shown.

Figure 15 presents the performance of Rudder No. 2 at low advance ratio (J=0.17) for two rates of propeller revolution of 800rpm and 1460rpm. The rudder sideforce and drag are non-dimensionalised using $\frac{1}{2}\rho AK_T n^2D^2$.

Figures 16 to 20 present the variation of rudder sideforce and drag against incidence at zero advance ratio. The sideforce and drag are again non-dimensionalised using $\frac{1}{2}\rho AK_T n^2D^2$. The performance of Rudder No. 2 at zero advance ratio (J=0) for different propeller revolutions is shown in Fig. 16. Figs. 17 and 18 compare the performance of Rudder No.2 at different longitudinal separations of X/D=0.30, 0.39 and 0.52 for propeller revolutions of 750 and 1460 rpm respectively. The effect of different lateral separation (Y/D) is presented in Fig. 19 at a propeller speed of 1460rpm. Figure 20 compares the performance of Rudder No.'s 2 and 3 at 1166rpm. The variation with propeller advance ratio J of rudder lift-curve slope (non-dimensionalised using $\frac{1}{2}\rho AK_T n^2D^2$) at zero incidence is shown in Fig. 21.

Figures 22 and 23 present the variation of propeller thrust (K_T) and torque (K_Q) for

rudder incidence in the range -70° to +70° for three propeller advance ratio of J=0.94, 0.51 and 0.36. These were obtained for a longitudinal separation of X/D=0.39 with all-movable Rudder No. 2. The corresponding open water values of thrust and torque for the advance ratios tested are also shown.

The four quadrant performance of the propeller ahead of a rudder is presented in Figs. 24 and 25 for propeller thrust C_T* and torque C_Q*. Each figure consists of four plots, one for each quadrant.

The influence of the rudder on propeller performance at low and zero speed advance ratio is shown as Figs 26 (propeller thrust K_T) and 27 (propeller torque K_Q).

Figures 28 to 33 give the distribution of two-dimensional normal force coefficient (C_n) over the complete rudder span for the seven rudder incidence tested (-30°, -20°, -10°, 0°, +10°, +20°, and +30°) at a series of different propeller advance angle covering all four quadrants of operation. It is assumed that the local C_n at the root is equal to that at the next inboard section and that at the rudder tip C_n is zero.

Figures 34 to 39 give the chordwise pressure distributions at eight spans on the rudder corresponding to the normal force coefficients presented in Figures 28 to 33.

7. DISCUSSION OF RESULTS

7.1 Four quadrant performance of propeller in free-stream

Dimensions and particulars of the propeller are given in Table II. In all the current tests the propeller pitch ratio was set at a mean value of 0.95.

Full details of the free-stream characteristics for the first quadrant, including the results for different pitch settings and influence of Reynolds Number, are given in Ref. 13. Departures from the Wageningen B4.40 characteristics in the first quadrant were relatively small and accountable. These differences are discussed in some detail in Refs. 3 and 13.

The free-stream performance characteristics in four quadrants for a pitch ratio of 0.95 are shown in Figs. 4 and 5. Also included in Fig. 4 are the four quadrant results for the Wageningen B4.40 propeller, derived from Ref. 12. It is seen in Fig. 4 that the differences between the results are small in regions of high thrust loading although the results of the current work are high compared with the Wageningen results in regions of low thrust loading, i.e. as n approaches zero (ψ = 90° and 270°). It is considered that this could be due to both the influence of the modifications to the propeller in way of the hub and the level of sensitivity of the propeller dynamometer which makes it difficult to monitor accurately very low thrust levels. It is worth commenting that these departures do occur in areas of lesser importance as far as propeller-rudder interaction is concerned. This is similarly seen for the torque characteristic C_Q* shown in Fig. 5.

7.2 Rudder free-stream performance in forward and reverse flow

In Fig. 6 the free-stream (forward/ahead) performance shows little difference between the two wind speeds of 10m/s and 20m/s. The behaviour of the rudder at large angles of attack is as expected: lift decreasing while drag carries on rising. After stall the chordwise CP moves progressively aft towards 50% of chord whereas the spanwise CP is not significantly changed.

The reverse free-stream (astern) behaviour (Fig. 7) of Rudder No. 2 is apparently more sensitive to wind speed. This is probably due to the presence of separated regions of flow at the sharp rudder trailing edge which is facing into the reversed flow. For these tests roughness strips were not applied close to the trailing edge. The slope of the lift characteristic has a negative value of about 60% of that for the ahead case. The spanwise CP remains at 50% span. The chordwise CPc is different for positive and negative incidence and is in the range 70% to 90% of chord. This is as expected for reverse flow where the predicted CPc for instance of a flat plate is at 25% from the upstream end or in the rudder notation used for these tests at a CPc of 75%.

7.3 Influence of propeller on rudder performance

7.3.1 Four quadrant performance

7.3.1.1 Quadrant I +v, +n

The results of the basic experimental work in Quadrant 1 are reported in Refs. 1, 2, 3, 4. As well as investigating propeller thrust loading, the investigations included the influence of longitudinal, lateral and vertical rudder-propeller separation, together with the influence of rudder aspect ratio and propeller/rudder coverage.

In these tests for propeller advance ratio J of 0.51 and 0.36 the 1st Quadrant large angle behaviour was tested (Fig. 8). The overall shape of the lift, drag and CP characteristic is similar to that of the free-stream. It is interesting to note that for incidences beyond 35^{o} (commonly used as a stop for maximum ship rudder angles) sideforce continues to rise for the lowest J to just beyond 40^{o} and beyond that decreases while the drag carries on steeply rising. This implies a potential for smaller radius turning circles if speed can be sacrificed.

Further tests have been carried out to extend the range of revs investigated to lower values until propeller thrust reversal has occurred. This is illustrated in Fig. 9a where it is seen that as n decreases to less than about 800 rpm, or $K_T/J^2 \rightarrow 0$, the lift curve falls below free-stream rudder performance. The propeller is now taking energy out of the fluid and forces developed by the rudder are small.

The drop off in lift is illustrated in Fig. 14 which shows a gradual decrease in the lift at $+10^{o}$ rudder incidence for propeller advance angles greater than 23^{o} ($J >= 0.94$). The minimum which occurs at 90^{o} was measured with the propeller stationary and with the propeller blade generator at $+30^{o}$ to the horizontal (viewed from aft). The C_L at $\psi = 90^{o}$ is about 50% of the free-stream value.

The shape of the drag characteristic (Fig. 10a) remains constant for increasing advance angle ($\psi > 23^0$) but the zero incidence drag decreases and gives negative drag (thrust) for the stopped propeller.

The slope of the rudder torque characteristic (Fig. 11a) changes sign from negative to positive as propeller revs. are reduced. The behaviour of the root bending moments C_{Mx} and C_{My} (Figs. 12a and 13a) follow that of the lift and drag characteristic.

7.3.1.2 Quadrant II +v, -n

Fig. 9b shows that as revs. are increased in the negative sense, at about -800 rpm flow over the rudder (and lift force) is reversed. With further increase in negative revs to -1453 and negative incidence, there is a further reversal of the flow although it is seen that for positive incidence a breakdown of the flow appears to have occurred. Vibration in the test rig precluded further (-ve) increase in test revs in this very complicated flow situation.

In Fig. 14 the breakdown in flow over the rudder can be seen as a sharp drop off in developed lift at $+10^0$ in the 2nd Quadrant. Likewise, the drag characteristic (Fig. 10b) changes markedly with increasing negative revs. until at -1460rpm the rudder develops a thrust which is almost independent of rudder incidence. The results at +10m/s and +20m/s are close giving confidence that the results have little dependence on Reynolds number. The rudder torque C_{Mz} (Fig. 11b) increase with increasing negative revs. although it is still less than the maximum free-stream value.

7.3.1.3 Quadrant III -v, -n

In this case, with complete reversal of signs for speed and revs, the rudder is now effectively working upstream of the propeller. The propeller therefore provides little acceleration and the rudder is effectively working in the astern free-stream condition. The lift curve slope (Fig. 9c) for the various n (J) values are all at about astern free-stream (see Fig. 7). The only noticeable difference is that larger forces can be developed at larger rudder angles due to the delay in stall angle with increasing negative revolutions. The almost constant lift at $+10^0$ is seen in Fig. 14. Again as in Quadrant I at $\psi = 270^0$ there is a slight decrease in value with the propeller stationary.

In Quadrant III the drag characteristic (Fig. 10c) is completely reversed, with decreasing revs (increasing propeller advance angle) the generated thrust reduces. The rudder torque (Fig. 11c) collapses onto a single line again similar to the reverse free-stream behaviour. However, unlike the 1st Quadrant the sideforce and torque have the same sign with possible implications for control systems. Again the root bending moments follow the lift and drag behaviour (Figs. 12c and 13c).

7.3.1.4 Quadrant IV -v, +n

Fig. 9d shows that as revolutions are increased rudder forces diminish although, even at relatively high n values, the flow has still not reversed, unlike the converse case of Quadrant 2. It is apparent that a further increase in (+ve) revs, or decrease in (-ve) speed is required before flow reversal will occur. Vibration in the test rig precluded further

increase in test revs in this very complicated flow situation.

The zero incidence drag (Fig. 10d) increases with increasing propeller revolutions corresponding to the behaviour observed in Quadrant II. The rudder torque (Fig. 11d) collapses with increasing revs. The drop off in lift at $+10^{o}$ rudder incidence in Fig. 14 again follows that in the 2nd Quadrant.

7.3.2 Zero advance ratio (negative revs)

Very small rudder forces were developed in the tests and the results are not presented.

It is noted for example that in Quadrant 3, for -v, -n, the propeller had little influence on the (astern) free-stream characteristics. It follows therefore that for zero speed, negative propeller revs are unlikely to develop any significant rudder forces.

7.3.3 Zero and low advance ratio (positive revs)

7.3.3.1 Low advance ratio

Figure 15 compares the performance of Rudder No. 2 for two rates of revolution. It can be seen that the results are broadly similar. The lift characteristic at 1460rpm having a slightly higher C_{Lmax}' and that there is a small shift in CPs. However, the drag and CPc show virtually no difference. The results compare well with those obtained in the previous preliminary test reported in Ref. 11 which also gives measurements of rudder surface pressure distributions for the low J case.

7.3.3.2 Propeller revolutions at Zero J

The changes in sideforce and drag at zero J, for three rates of revolution, are shown in Fig. 16. Increasing the propeller rpm between 1166 and 1460 does not have any significant effect whereas there is a lift and drag offset for the results at 750rpm. This is likely to be due to a combination of the small values of absolute force measured at this speed and possible scale effects. Overall, the stall angle at zero J occurs later thane in the low J tests (Fig. 15) and the lift curve slope $dC_L'/d\alpha$ is lower at zero J. This is illustrated in Fig.21 which plots the change in lift-curve slope $dC_L'/d\alpha$ (non-dimensionalised using $0.5\rho AK_T n^2D^2$) against advance ratio. It can be seen that for $J<0.30$ there appears to be a linear relationship between lift-curve slope and advance ratio. This confirms the division of the rudder presentation into two distinct domains dependant on propeller thrust loading.

7.3.3.3 Longitudinal separation at zero J

Figs. 17 and 18 show for 750rpm and 1460rpm respectively the effect of longitudinal separation X/D on rudder sideforce and drag. At the higher rpm the results are more consistent (see previous section) and the discussion will be confined to Fig. 18. There is very little, if any, change in lift-curve slope with separation as was also found for the results already obtained (Ref. 1) for a non-zero advance ratio. Drag reduces with increasing separation and for $X/D=0.39$ and 0.52 a thrust is generated at zero incidence. Again, this

follows the previously reported results (Ref. 1).

7.3.3.4 Lateral separation at zero J

Fig. 19 gives the influence of lateral separation (Y/D) on the performance of Rudder No. 2. The behaviour of lift and drag is consistent with the results obtained in the wind tunnel tests reported in Ref. 2 for the same geometrical arrangement but at non-zero advance ratio.

7.3.3.5 Rudder aspect ratio

The increased span and hence aspect ratio of Rudder No. 3 gives a lower drag and lift than that for Rudder No. 2 (Fig. 20). The difference in lift-curve slope between the two lift characteristics is equal to the difference in rudder area. This means that the absolute force developed is the same which as expected: only the rudder area in way of the propeller race will develop lift and generate drag at zero J (Ref. 4).

7.4 Influence of rudder on propeller performance

7.4.1 Four quadrant performance

The first Quadrant propeller performance for rudder incidence up to 70^{o} is shown in Figs. 22 (K_T) and 23 (K_Q). There is in the K_T results at J=0.51 and considerable scatter at J=0.94 when the absolute K_T values are in any case very low. However, using the more consistent propeller torque data and the propeller identity relating thrust and torque it can be seen that:

(i) The presence of the rudder gives rise to a thrust augment corresponding to the effective reduction in speed of inflow into the propeller due to the blockage of the flow by the rudder.

(ii) The magnitude of the thrust augment for all advance ratios, rises with rudder incidence up to 40^{o} and for the lowest advance ratio (J=0.36) it reduces for incidence beyond 40^{o}.

Figs. 24 and 25 present the thrust C_T* and torque C_Q* propeller data for all four quadrants of operation. In general, rudder incidence only has a small influence on the propeller performance. However, for Quadrant IV (and for low rpm in Quadrant III) there is a dramatic drop in thrust (and torque) as incidence increases.

7.4.2 Zero and low advance ratio

The effect of the rudder on propeller performance at zero and low J is shown in Figs. 26 and 27. Again, there is a considerable scatter in the thrust characteristic but the torque characteristic shows that:

(i) Propeller torque and hence thrust is independent of propeller revolutions.

(ii) The rudder gives rise to a thrust augment.

(iii) Propeller torque rises for incidence up to 30^{o} at zero J and then drops off quite rapidly.

7.5 Spanwise load distribution on rudder behind propeller

Figures 28 through to 33 give a detailed picture of the spanwise load distribution over the rudder in all four quadrants. It can be seen in Fig. 28 (+400rpm, Quadrant I) that the propeller is extracting energy from the flow and this results in a normal force lower in way of the propeller race than in the free-stream. As the propeller direction is reversed almost no flow passes over the rudder in way of the propeller race at -800rpm (Fig. 29, Quadrant II) and at -1460rpm (Fig. 30, Quadrant II) the flow is reversed in way of the propeller.

In the third Quadrant with a reversed free-stream flow direction the rudder is working in the opposite sense to normal (positive incidence giving negative side force) and that as propeller revs. are increased from -800rpm (Fig. 31) to -1460rpm (Fig. 32) the magnitude of the sideforce increases for rudder incidence beyond $+10^{o}$ as can be seen in Fig. 9c.

The fourth quadrant behaviour is shown in Fig. 33. The load distribution remains reversed but the magnitude is lower implying that the positive rotating propeller is slowing the flow passing over the rudder.

7.6 Chordwise pressure distribution

The chordwise pressure distributions presented as Figs. 34 to 39 will not be described in detail. They do provide information as to the detailed load distribution over a rudder operating in all four quadrants and hence are of value for carrying out quasi-static stress analysis of loaded rudders. Particularly interesting features can be seen in the pressure distributions resulting from reversed flow over the rudder (Quadrants III and IV, Figs. 37 to 39).

8. CONCLUSIONS AND RECOMMENDATIONS

8.1 The results for the propeller alone indicated that in all four quadrants of operation, it behaved in a manner broadly similar to other published data for its type.

8.2 The reverse (astern) free-stream behaviour of Rudder No. 2 generates 60% of the ahead sideforce and is in the opposite direction to that in the forward (ahead) condition.

8.3 At high thrust loading useful rudder sideforce is produced for rudder incidence beyond 35^{o}. The corresponding rapid increase in drag could be used to good effect in increasing vessel manoeuvrability at low speeds by removing rudder stops set at 35^{o}.

8.4 In the first quadrant of operation (+v, +n) the rudder demonstrated a decreasing lift curve slope with decreasing propeller thrust loading until, at very low loading, the rudder forces were less than those in the free-stream.

In the second quadrant (+v, -n) it was seen that, with significant negative revolutions, force reversal occurs on the rudder.

In the third quadrant (-v, -n) the rudder is now effectively working upstream of the propeller. The propeller provides little acceleration to the flow and the rudder is effectively working in the astern free-stream condition, although with larger stall angles than for rudder alone.

In the fourth quadrant (-v, +n), increasing positive revolutions decreased the rudder forces to very low levels, although rudder force reversal to a positive lift curve slope was not achieved.

Overall, the results provide essential information for the development of improved and physically correct methods for the prediction of rudder characteristics when operating behind a propeller.

8.5 At zero ship speed and negative propeller revolutions the measured rudder forces were so small as to be of little significance. At zero ship speed and positive propeller revolutions the accelerating effect of the propeller is clearly demonstrated. Significant rudder forces, broadly proportional to the square of revolutions, are generated.

Longitudinal separation (at zero J) did not have a significant affect on rudder lift and changes in lateral separation and rudder span followed the trends found for the non-zero advance ratio carried out in the wind tunnel. The implication of these results is that, with further work, the laboratory (zero J) test procedure could be used to provide rudder design information at a greatly reduced cost compared with wind tunnel tests.

8.6 The measured propeller characteristics and rudder drag data allow the total thrust augment/deficit to be calculated for all four quadrants of operation.

8.7 The large amount of tabulated and graphical data provide an essential resource for the development and validation of theoretical prediction methods.

8.8 The versatility of the developed rudder-propeller rig and the ability to rapidly change configuration has been demonstrated.

9. ACKNOWLEDGEMENTS

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TABLE I: PARTICULARS OF THE TWO ALL-MOVABLE RUDDER MODELS

Rudder No.	**2**	**3**
Chord c mm	667	667
Span S mm	1000	1200
Geometric Aspect Ratio AR_G	3.0	3.6
Taper Ratio C_T/C_R	1.0	1.0
Thickness/chord Ratio t/c	0.20	0.20
Section	NACA 0020 constant section with square tip	

TABLE II: PROPELLER DETAILS - Modified Wageningen B.4.40 Series

Number of Blades	4
Range of revolutions rpm	0 to 3000
Diameter mm	800
Boss Diameter (max) mm	200
Mean Pitch Ratio	0.95 (set for tests)
Blade Area Ratio	0.40
Rake (deg)	0
Blade thickness ratio t/D	0.050
Sections shape	Based on Wageningen B series
Blade outline shape	Based on Wageningen but with reduced skew

TABLE III: TEST CASES - PROPELLER PLUS RUDDER

Quadrant of operation	Wind speed V m/s	Test revs n (rpm)	Prop advance angle ψ	J	K_T	K_T/J^2	Prop C_T*
	0	750	0	0	0.37	-	0.195
	0	1400	0	0	0.37	-	0.195
	10	+2780	7.0	0.27	0.31	4.25	0.16
	10	2100	9.2	0.35	0.28	2.30	0.14
	10	1460	13.1	0.51	0.23	0.88	0.114
1	10	805	23.0	0.94	0.04	0.05	0.02
	10	(735)	24.9	1.02	0	0	0
	10	400	40.5	1.88	-0.62	-0.18	-0.24
	10	200	59.6	3.75	-3.71	-0.26	-0.46
	10	0	90.0	-	-	-	-0.52
	10	0	90.0	-	-	-	-0.52
	10	-200	120.4	-3.75	-4.45	-0.32	-0.58
2	10	-400	139.5	-1.88	-1.31	-0.37	-0.57
	10	-800	156.9	-0.94	-0.63	-0.71	-0.29
	10	-1453	166.9	-0.51	-0.20	-0.77	-0.12
	0	-n	180.0				-0.12
	-10	-2105	189.2	0.35	-0.097	-0.79	-0.10
	-10	-1460	193.1	0.51	0	0	-0.07
3	-10	-800	203.0	0.94	0.18	0.20	0.02
	-10	-400	220.5	1.88	0.99	0.28	0.24
	-10	0	270.0	-	-	-	0.47
	-10	0	270.0	-	-	-	0.47
4	-10	+400	319.5	-1.88	1.64	0.47	0.51
	-10	800	336.9	-0.94	0.67	0.76	0.25
	-10	1460	346.9	-0.51	0.40	1.54	0.17
	0	750	360.0	0	0.37	-	0.195
	0	1400	360.0	0	0.37	-	0.195

APPENDIX A RUDDER FORCE DATA

RUDDER DYNAMOMETER
epfsv136.rud Free-stream Rudder No. 2 10m/s

Angle	V	RPM	Cl	Cn	Cd	Cmz	Cmx	Cmy	Cpc	Cps
-40.00	10.00	0.00	-0.5610	-0.789	0.559	-0.070	-0.3870	0.2590	38.879	41.147
-35.00	10.00	0.00	-0.5270	-0.694	0.459	-0.051	-0.3630	0.2190	37.339	43.338
-30.00	10.00	0.00	-0.4930	-0.618	0.382	-0.040	-0.3340	0.1910	36.486	44.669
-25.00	10.00	0.00	-0.8500	-0.871	0.239	0.020	-0.5960	0.1230	27.683	50.451
-20.00	10.00	0.00	-0.9260	-0.927	0.167	0.055	-0.6160	0.0840	24.100	48.039
-15.00	10.00	0.00	-0.7510	-0.751	0.099	0.059	-0.4880	0.0510	22.183	46.934
-10.00	10.00	0.00	-0.4980	-0.500	0.056	0.047	-0.3150	0.0280	20.501	45.587
-5.00	10.00	0.00	-0.2370	-0.239	0.031	0.027	-0.1490	0.0150	18.881	45.044
0.00	10.00	0.00	0.0097	0.010	0.018	0.002	0.0150	0.0110	48.595	173.486
5.00	10.00	0.00	0.2500	0.251	0.023	-0.022	0.1770	0.0150	21.277	53.319
10.00	10.00	0.00	0.4930	0.494	0.045	-0.042	0.3400	0.0260	21.383	51.158

RUDDER DYNAMOMETER
epfsv236.rud Free-stream Rudder No. 2 20m/s

Angle	V	RPM	Cl	Cn	Cd	Cmz	Cmx	Cmy	Cpc	Cps
-15.00	20.00	0.00	-0.7720	-0.768	0.087	0.060	-0.4970	0.0630	22.203	47.165
-10.00	20.00	0.00	-0.5120	-0.513	0.047	0.044	-0.3250	0.0360	21.405	46.130
-5.00	20.00	0.00	-0.2470	-0.249	0.024	0.023	-0.1520	0.0190	20.842	44.047
-4.00	20.00	0.00	-0.1980	-0.199	0.022	0.019	-0.1190	0.0160	20.667	42.917
-3.00	20.00	0.00	-0.1470	-0.148	0.020	0.014	-0.0870	0.0150	20.475	41.833
-2.00	20.00	0.00	-0.0940	-0.094	0.018	0.009	-0.0530	0.0130	20.233	39.164
-1.00	20.00	0.00	-0.0400	-0.041	0.017	0.004	-0.0190	0.0120	19.349	30.358
0.00	20.00	0.00	0.0083	0.008	0.017	-0.001	0.0130	0.0123	17.328	163.675
1.00	20.00	0.00	0.0560	0.056	0.016	-0.006	0.0450	0.0120	19.825	63.009
2.00	20.00	0.00	0.1090	0.110	0.017	-0.011	0.0790	0.0130	20.357	54.706
3.00	20.00	0.00	0.1580	0.159	0.018	-0.016	0.1100	0.0140	20.081	52.183
4.00	20.00	0.00	0.2110	0.212	0.020	-0.021	0.1450	0.0150	20.291	51.011
5.00	20.00	0.00	0.2620	0.263	0.022	-0.025	0.1770	0.0170	20.340	49.970
10.00	20.00	0.00	0.5190	0.519	0.045	-0.045	0.3460	0.0310	21.269	49.170
15.00	20.00	0.00	0.7820	0.778	0.086	-0.060	0.5200	0.0590	22.278	49.060
20.00	20.00	0.00	1.0040	0.996	0.152	-0.054	0.6800	0.1040	24.547	50.225
25.00	20.00	0.00	0.8190	0.845	0.245	0.001	0.5700	0.1620	30.149	51.706
30.00	20.00	0.00	0.7680	0.819	0.307	0.017	0.5400	0.2070	32.012	52.288
35.00	20.00	0.00	0.6980	0.854	0.492	0.052	0.4970	0.3230	36.028	51.834
40.00	20.00	0.00	0.5890	0.814	0.565	0.079	0.4210	0.3590	39.675	50.473
45.00	20.00	0.00	0.6030	0.891	0.658	0.095	0.4260	0.4250	40.692	50.038
50.00	20.00	0.00	0.5960	0.964	0.758	0.124	0.4340	0.4960	42.842	50.884
55.00	20.00	0.00	0.5750	1.063	0.895	0.149	0.4300	0.5690	43.998	49.563
60.00	20.00	0.00	0.5580	1.155	1.011	0.165	0.4130	0.6400	44.310	48.361
65.00	20.00	0.00	0.4940	1.233	1.130	0.197	0.3820	0.7060	45.990	47.482
70.00	20.00	0.00	0.4150	1.289	1.220	0.227	0.3350	0.7580	47.595	46.670

RUDDER DYNAMOMETER
eprfsv133.rud Reverse Free-stream Rudder No.2 10m/s

Angle	V	RPM	Cl	Cn	Cd	Cmz	Cmx	Cmy	Cpc	Cps
-15.00	10.00	0.00	0.8090	0.872	-0.351	0.350	0.5390	-0.1850	70.094	47.756
-10.00	10.00	0.00	0.7860	0.811	-0.208	0.331	0.5150	-0.1050	70.874	47.314
-5.00	10.00	0.00	0.5100	0.519	-0.124	0.185	0.3270	-0.0590	65.635	46.315
0.00	10.00	0.00	0.1310	0.131	-0.042	0.023	0.0790	-0.0300	47.942	42.917
5.00	10.00	0.00	-0.2040	-0.210	-0.071	-0.128	-0.1410	-0.0320	91.128	51.043
10.00	10.00	0.00	-0.5570	-0.570	-0.125	-0.297	-0.3760	-0.0790	82.004	49.865
15.00	10.00	0.00	-0.7820	-0.830	-0.291	-0.394	-0.5390	-0.1670	77.469	50.342

RUDDER DYNAMOMETER
eprfsv233.rud Reverse Free-stream Rudder No.2 20m/s

Angle	V	RPM	Cl	Cn	Cd	Cmz	Cmx	Cmy	Cpc	Cps
-15.00	20.00	0.00	0.6500	0.703	-0.291	0.328	0.4480	-0.1760	76.698	50.586
-10.00	20.00	0.00	0.6580	0.673	-0.142	0.329	0.4270	-0.0820	78.964	47.194
-5.00	20.00	0.00	0.3260	0.333	-0.096	0.169	0.2080	-0.0380	80.658	45.764
0.00	20.00	0.00	0.0030	0.003	-0.034	0.010	-0.0030	-0.0230	434.556	-142.648
5.00	20.00	0.00	-0.1980	-0.203	-0.060	-0.130	-0.1370	-0.0290	94.105	51.094
10.00	20.00	0.00	-0.5450	-0.558	-0.123	-0.318	-0.3640	-0.0710	86.906	49.022

RUDDER DYNAMOMETER
epflj7.rud 800 rpm 0 m/s X/D=0.39

Angle	V	RPM	Cl	Cn	Cd	Cmz	Cmx	Cmy	Cpc	Cps
-70.00	6.42	804.26	-0.6080	-1.366	1.232	-0.148	-0.5510	0.6830	40.819	43.295
-65.00	6.42	804.26	-0.7070	-1.331	1.140	-0.124	-0.5880	0.6000	39.267	42.014
-60.00	6.42	804.26	-0.7890	-1.307	1.053	-0.089	-0.6230	0.5170	36.777	40.593
-55.00	6.42	804.26	-0.8190	-1.261	0.966	-0.068	-0.6400	0.4320	35.366	39.677
-50.00	6.42	804.26	-1.1710	-1.364	0.798	0.036	-0.8570	0.3350	27.347	41.649
-45.00	6.42	804.26	-1.1380	-1.270	0.657	0.036	-0.8150	0.2120	27.174	39.703
-40.00	6.42	804.26	-1.0920	-1.186	0.544	0.043	-0.7440	0.1140	26.391	36.774
-35.00	6.42	804.26	-0.9910	-1.040	0.397	0.056	-0.6560	0.0840	24.572	38.820
-30.00	6.42	804.26	-0.8710	-0.903	0.296	0.063	-0.5740	0.0640	22.995	41.142
-25.00	6.42	804.26	-0.7330	-0.752	0.209	0.066	-0.4700	0.0460	21.148	41.697
-20.00	6.42	804.26	-0.5940	-0.606	0.138	0.056	-0.3650	0.0370	20.739	41.201
-15.00	6.42	804.26	-0.4560	-0.457	0.067	0.045	-0.2600	0.0240	20.046	38.767
-10.00	6.42	804.26	-0.2970	-0.297	0.025	0.024	-0.1540	0.0150	21.749	34.460
-5.00	6.42	804.26	-0.1390	-0.139	-0.001	0.007	-0.0410	0.0090	24.888	12.497
0.00	6.42	804.26	0.0042	0.004	-0.021	-0.002	0.0487	-0.0055	1679.326	-1544.598
5.00	6.42	804.26	0.1570	0.156	-0.010	-0.010	0.1580	-0.0180	23.356	82.253
10.00	6.42	804.26	0.2940	0.294	0.023	-0.035	0.2670	-0.0130	18.234	71.395
15.00	6.42	804.26	0.4510	0.450	0.055	-0.052	0.3770	-0.0070	18.495	62.929
20.00	6.42	804.26	0.5670	0.568	0.102	-0.065	0.4780	0.0090	18.499	62.183
25.00	6.42	804.26	0.7230	0.731	0.180	-0.072	0.5910	0.0320	20.176	57.636
30.00	6.42	804.26	0.8580	0.856	0.227	-0.075	0.7070	0.0630	21.275	57.732
35.00	6.42	804.26	0.9920	1.029	0.378	-0.074	0.8160	0.0970	22.820	52.846
40.00	6.42	804.26	1.1060	1.168	0.499	-0.069	0.9130	0.1350	24.039	49.750
45.00	6.42	804.26	0.9190	1.172	0.739	-0.019	0.7680	0.3300	28.352	48.703

50.00	6.42	804.26	0.8020	1.246	0.954	0.055	0.6330	0.4600	34.416	43.408
55.00	6.42	804.26	0.7210	1.289	1.068	0.080	0.6000	0.5310	36.191	42.927
60.00	6.42	804.26	0.6470	1.347	1.182	0.101	0.5540	0.5940	37.497	41.235
65.00	6.42	804.26	0.5590	1.406	1.291	0.126	0.5090	0.6350	38.922	38.699
70.00	6.42	804.26	0.4460	1.441	1.371	0.147	0.4660	0.6720	40.162	37.366

RUDDER DYNAMOMETER
epflj8.rud 1460 rpm 0 m/s X/D=0.39

Angle	V	RPM	Cl	Cn	Cd	Cmz	Cmx	Cmy	Cpc	Cps
-70.00	11.60	1459.62	-0.6090	-1.425	1.295	-0.168	-0.4610	0.8210	41.790	47.658
-60.00	11.60	1459.62	-0.8310	-1.411	1.149	-0.116	-0.5690	0.6880	38.198	44.895
-50.00	11.60	1459.62	-1.2340	-1.463	0.874	0.019	-0.8310	0.5050	28.693	45.476
-40.00	11.60	1459.62	-1.1640	-1.257	0.569	0.066	-0.7580	0.2920	24.760	43.641
-30.00	11.60	1459.62	-0.9560	-0.987	0.319	0.083	-0.6020	0.1620	21.621	43.550
-20.00	11.60	1459.62	-0.6290	-0.639	0.139	0.072	-0.3760	0.0720	18.685	41.590
-10.00	11.60	1459.62	-0.3110	-0.311	0.028	0.041	-0.1460	0.0120	16.876	29.499
-5.00	11.60	1459.62	-0.1520	-0.151	-0.010	0.025	-0.0340	-0.0050	13.663	4.433
0.00	11.60	1459.93	0.0098	0.010	-0.003	0.008	0.0612	-0.0172	276.038	540.064
5.00	11.60	1459.62	0.1620	0.162	0.001	-0.018	0.1940	-0.0170	18.906	101.226
10.00	11.60	1459.62	0.3120	0.311	0.022	-0.040	0.3080	-0.0050	17.118	79.747
20.00	11.60	1459.62	0.6090	0.616	0.128	-0.069	0.5390	0.0610	18.815	68.163
25.00	11.60	1459.62	0.7680	0.786	0.213	-0.081	0.6670	0.1100	19.707	65.293
30.00	11.60	1459.62	0.9210	0.946	0.297	-0.086	0.7840	0.1650	20.863	62.946
40.00	11.60	1459.62	1.1930	1.260	0.538	-0.071	0.9830	0.3110	24.335	58.123
50.00	11.60	1459.62	0.9330	1.305	0.922	0.033	0.7780	0.6220	32.475	57.259
60.00	11.60	1459.62	0.7230	1.395	1.194	0.112	0.5590	0.7700	38.040	50.331
70.00	11.60	1459.62	0.5000	1.406	1.314	0.152	0.4260	0.8150	40.773	47.308

RUDDER DYNAMOMETER
epflaj13.rud 800 rpm 10m/s Rudder No. 2 X/D=0.39

Angle	V	RPM	Cl	Cn	Cd	Cmz	Cmx	Cmy	Cpc	Cps
-30.00	10.00	806.67	-1.1440	-1.213	0.444	-0.032	-0.8440	0.2630	32.658	53.581
-25.00	10.00	806.67	-1.1330	-1.165	0.327	-0.002	-0.7860	0.1970	30.159	50.813
-20.00	10.00	806.67	-1.0950	-1.095	0.192	0.049	-0.7120	0.1230	25.510	47.437
-15.00	10.00	806.67	-0.8420	-0.848	0.135	0.046	-0.5290	0.0770	24.577	45.154
-10.00	10.00	806.67	-0.5550	-0.562	0.084	0.037	-0.3400	0.0450	23.405	43.551
-5.00	10.00	806.67	-0.2950	-0.298	0.052	0.021	-0.1650	0.0260	23.023	38.228
0.00	10.00	806.67	-0.0265	-0.026	0.028	0.001	0.0040	0.0190	22.983	-36.687
5.00	10.00	806.67	0.2490	0.250	0.023	-0.017	0.1760	0.0260	23.132	53.524
10.00	10.00	806.67	0.5310	0.533	0.053	-0.033	0.3590	0.0430	23.823	50.358
15.00	10.00	806.67	0.8050	0.805	0.108	-0.039	0.5460	0.0730	25.083	50.295
20.00	10.00	806.67	1.0430	1.044	0.187	-0.037	0.7190	0.1180	26.436	51.053
25.00	10.00	806.67	1.3220	1.324	0.298	-0.027	0.9170	0.1830	27.949	51.113
30.00	10.00	806.67	1.5910	1.591	0.426	-0.002	1.0910	0.2650	29.864	50.172

RUDDER DYNAMOMETER
epflaj2.rud 1460 rpm 10m/s Rudder No. 2 X/D=0.39

Angle	V	RPM	Cl	Cn	Cd	Cmz	Cmx	Cmy	Cpc	Cps
-70.00	10.00	1458.69	-1.4020	-3.162	2.854	-0.526	-1.0250	1.9240	46.613	50.766
-60.00	10.00	1458.69	-1.7350	-2.989	2.449	-0.401	-1.2440	1.5860	43.388	49.266
-50.00	10.00	1458.69	-1.9030	-2.770	2.020	-0.278	-1.3110	1.2470	40.013	47.415
-40.00	10.00	1461.73	-1.7760	-2.319	1.490	-0.167	-1.1665	0.8895	37.187	45.723
-35.00	10.00	1464.77	-1.9040	-2.300	1.292	-0.161	-1.2460	0.8050	36.983	46.936
-30.00	10.00	1461.73	-2.6405	-2.682	0.793	0.061	-1.7435	0.5280	27.720	48.611
-25.00	10.00	1464.77	-2.3830	-2.373	0.505	0.114	-1.5210	0.3510	25.185	46.858
-20.00	10.00	1461.73	-1.9280	-1.923	0.327	0.108	-1.2010	0.2310	24.351	45.263
-15.00	10.00	1464.77	-1.4400	-1.438	0.181	0.101	-0.8670	0.1320	22.986	43.088
-10.00	10.00	1461.73	-0.9665	-0.968	0.095	0.071	-0.5445	0.0755	22.688	39.261
-7.50	10.00	1458.69	-0.7470	-0.751	0.079	0.050	-0.3880	0.0630	23.299	34.791
-5.00	10.00	1461.73	-0.4925	-0.494	0.045	0.036	-0.2355	0.0385	22.725	30.696
-4.00	10.00	1458.69	-0.4150	-0.418	0.049	0.026	-0.1760	0.0400	23.759	25.138
-3.00	10.00	1458.69	-0.3260	-0.328	0.045	0.019	-0.1190	0.0360	24.225	19.301
-2.00	10.00	1458.69	-0.2380	-0.239	0.046	0.013	-0.0560	0.0330	24.432	6.546
-1.00	10.00	1458.69	-0.1410	-0.142	0.042	0.006	0.0050	0.0310	25.599	-20.507
0.00	10.00	1460.72	-0.0463	-0.046	0.031	-0.003	0.0737	0.0295	30.424	-207.331
1.00	10.00	1458.69	0.0430	0.044	0.040	-0.012	0.1370	0.0330	2.596	293.779
2.00	10.00	1458.69	0.1240	0.125	0.047	-0.021	0.2000	0.0340	13.594	142.872
3.00	10.00	1458.69	0.2200	0.222	0.049	-0.029	0.2670	0.0370	16.958	103.509
4.00	10.00	1458.69	0.3080	0.311	0.057	-0.036	0.3280	0.0410	18.444	88.686
5.00	10.00	1461.73	0.4085	0.411	0.044	-0.037	0.3910	0.0400	20.915	78.262
7.50	10.00	1458.69	0.6200	0.626	0.087	-0.061	0.5530	0.0600	20.243	71.314
10.00	10.00	1461.73	0.8645	0.868	0.101	-0.069	0.7135	0.0745	21.984	64.860
15.00	10.00	1464.77	1.3400	1.342	0.183	-0.085	1.0400	0.1320	23.653	59.895
20.00	10.00	1461.73	1.7440	1.761	0.356	-0.098	1.3515	0.2415	24.374	59.338
25.00	10.00	1464.77	2.1560	2.184	0.546	-0.073	1.6470	0.3850	26.632	58.294
30.00	10.00	1461.73	2.4495	2.551	0.860	-0.018	1.8750	0.6010	29.263	57.929
35.00	10.00	1461.73	2.6585	2.894	1.249	0.096	1.9835	0.8685	33.295	55.843
40.00	10.00	1461.73	2.7900	3.234	1.706	0.189	1.9715	1.1705	35.843	52.472
45.00	10.00	1458.69	2.6680	3.357	2.079	0.251	1.8680	1.4060	37.461	51.479
50.00	10.00	1461.73	2.4060	3.270	2.250	0.298	1.6550	1.5015	39.116	50.205
55.00	10.00	1458.69	2.1100	3.179	2.404	0.317	1.5060	1.5930	39.955	50.710
60.00	10.00	1461.73	1.7520	3.080	2.544	0.369	1.2575	1.6735	41.947	49.983
65.00	10.00	1458.69	1.4540	3.110	2.753	0.400	1.0770	1.7810	42.843	49.026
70.00	10.00	1461.73	1.2300	3.179	2.935	0.465	0.9445	1.9150	44.618	49.264

RUDDER DYNAMOMETER
epflaj3.rud 2100 rpm 10m/s Rudder No. 2 X/D=0.39

Angle	V	RPM	Cl	Cn	Cd	Cmz	Cmx	Cmy	Cpc	Cps
-70.00	10.00	2103.66	-2.4230	-5.376	4.839	-0.806	-1.8100	3.3420	44.974	52.427
-60.00	10.00	2103.66	-3.0460	-5.162	4.202	-0.609	-2.1360	2.8090	41.785	50.308
-50.00	10.00	2103.66	-3.2200	-4.670	3.394	-0.414	-2.2340	2.2020	38.855	49.365
-40.00	10.00	2103.78	-3.3515	-4.291	2.681	-0.303	-2.1945	1.6640	37.052	46.609
-35.00	10.00	2103.90	-4.6180	-4.744	1.675	0.186	-3.0400	1.1270	26.072	48.623
-30.00	10.00	2103.78	-4.1760	-4.217	1.200	0.236	-2.7240	0.8150	24.386	48.113
-25.00	10.00	2103.90	-3.5180	-3.530	0.808	0.242	-2.2470	0.5570	23.120	46.855

-20.00	10.00	2103.78	-2.8480	-2.846	0.495	0.222	-1.7625	0.3535	22.206	44.951
-15.00	10.00	2103.90	-2.1570	-2.149	0.256	0.186	-1.2840	0.1930	21.309	42.519
-10.00	10.00	2103.78	-1.4585	-1.453	0.096	0.130	-0.8140	0.0870	21.071	38.694
-7.50	10.00	2103.66	-1.1050	-1.102	0.050	0.093	-0.5720	0.0550	21.528	34.599
-5.00	10.00	2103.78	-0.7400	-0.738	0.012	0.067	-0.3275	0.0225	20.816	27.001
-4.00	10.00	2103.66	-0.6180	-0.617	0.005	0.055	-0.2370	0.0140	21.144	21.049
-3.00	10.00	2103.66	-0.4810	-0.480	0.002	0.043	-0.1450	0.0090	20.994	12.699
-2.00	10.00	2103.66	-0.3270	-0.327	-0.007	0.029	-0.0380	0.0030	21.129	-5.867
-1.00	10.00	2103.66	-0.1980	-0.198	-0.011	0.015	0.0580	0.0000	22.548	-46.853
0.00	10.00	2103.76	-0.0613	-0.061	-0.015	-0.002	0.1567	-0.0011	32.581	-420.378
1.00	10.00	2103.66	0.0680	0.068	-0.011	-0.015	0.2530	-0.0020	7.707	355.460
2.00	10.00	2103.66	0.2050	0.204	-0.009	-0.029	0.3510	0.0010	15.670	153.955
3.00	10.00	2103.66	0.3420	0.341	0.000	-0.043	0.4540	0.0010	17.263	115.520
4.00	10.00	2103.66	0.4700	0.469	0.009	-0.056	0.5500	0.0080	18.042	99.550
5.00	10.00	2103.78	0.6260	0.624	0.005	-0.068	0.6500	0.0130	19.033	86.441
7.50	10.00	2103.66	0.9430	0.942	0.054	-0.102	0.8900	0.0380	19.111	76.684
10.00	10.00	2103.78	1.2860	1.283	0.101	-0.128	1.1330	0.0710	20.024	70.385
15.00	10.00	2103.90	1.9430	1.940	0.242	-0.181	1.6130	0.1790	20.667	65.224
20.00	10.00	2103.78	2.5850	2.594	0.484	-0.217	2.1100	0.3365	21.608	63.349
25.00	10.00	2103.90	3.2180	3.236	0.758	-0.229	2.5760	0.5390	22.906	61.689
30.00	10.00	2103.78	3.8220	3.892	1.165	-0.204	3.0595	0.8315	24.756	61.254
35.00	10.00	2103.90	4.2660	4.456	1.676	-0.102	3.4080	1.2360	27.695	61.076
40.00	10.00	2103.78	4.3560	4.894	2.423	0.095	3.4735	1.7870	31.915	60.342
50.00	10.00	2103.66	3.8400	5.345	3.754	0.459	2.7540	2.6120	38.575	53.056
60.00	10.00	2103.66	2.8290	5.116	4.274	0.542	2.0240	2.8440	40.583	50.419
70.00	10.00	2103.66	2.0600	5.084	4.660	0.685	1.5360	3.1165	43.454	50.440

RUDDER DYNAMOMETER
epzj1x22.rud 750 rpm 0m/s Rudder No. 2 X/D=0.39

Angle	V	RPM	Cl	Cn	Cd	Cmz	Cmx	Cmy	Cpc	Cps
-60.00	6.03	755.50	-0.5030	-1.200	1.095	0.443	0.5140	-0.0630	-6.964	-43.472
-55.00	6.03	755.50	-0.5450	-1.143	1.013	0.641	0.3710	-0.0110	-26.108	-36.907
-50.00	6.03	755.50	-0.7900	-1.187	0.887	0.708	0.0580	0.0550	-29.656	-17.085
-45.00	6.03	755.50	-0.9300	-1.197	0.763	0.743	-0.1490	0.0990	-32.054	-2.832
-40.00	6.03	755.50	-0.8300	-1.023	0.603	0.778	-0.2460	0.1170	-46.088	8.215
-35.00	6.03	755.50	-0.7140	-0.856	0.473	0.798	-0.3270	0.1490	-63.242	23.793
-30.00	6.03	755.50	-0.6327	-0.730	0.365	0.516	-0.0247	0.1273	-40.706	-1.887
-25.00	6.03	755.50	-0.5550	-0.625	0.287	0.583	0.6050	0.0180	-63.331	-104.038
-20.00	6.03	755.50	-0.4370	-0.484	0.214	0.647	0.4980	0.0180	-103.759	-112.892
-15.00	6.03	755.50	-0.3170	-0.343	0.143	0.557	0.3870	0.0180	-132.319	-124.869
-10.00	6.03	755.50	-0.1760	-0.188	0.088	0.670	0.2900	0.0120	-325.757	-167.998
-5.00	6.03	755.50	-0.0330	-0.038	0.068	0.633	0.1760	-0.0010	-1615.135	-473.081
0.00	6.03	755.50	0.0496	0.050	0.029	0.413	0.0716	0.0156	1078.880	171.764
5.00	6.03	755.50	0.1820	0.184	0.031	0.272	-0.0140	0.0200	177.358	-24.116
10.00	6.03	755.50	0.2780	0.282	0.046	0.190	-0.1260	0.0240	97.462	-59.896
15.00	6.03	755.50	0.3960	0.407	0.095	0.162	-0.2360	0.0310	69.636	-71.411
20.00	6.03	755.50	0.4880	0.506	0.139	0.563	-0.3750	0.0490	141.164	-83.836
25.00	6.03	755.50	0.6070	0.631	0.190	0.412	-0.4780	0.0490	95.363	-82.922
30.00	6.03	755.50	0.6733	0.749	0.332	0.270	0.2043	0.1810	66.165	17.398
35.00	6.03	755.50	0.8170	0.938	0.468	0.235	0.5280	0.2130	55.081	41.661
40.00	6.03	755.50	0.9140	1.072	0.579	0.414	0.4360	0.1800	68.577	24.507
45.00	6.03	755.50	0.9920	1.211	0.720	0.300	0.3150	0.1720	54.787	10.938

50.00	6.03	755.50	0.6550	1.087	0.869	0.383	-0.0820	0.1920	65.234	-8.854
55.00	6.03	755.50	0.6010	1.206	1.051	0.363	-0.2750	0.1740	60.116	-18.765
60.00	6.03	755.50	0.5370	1.239	1.120	0.776	-0.5360	0.0410	92.655	-36.288
65.00	6.03	755.50	0.4130	1.232	1.166	0.326	-0.7450	-0.0750	56.438	-48.566
70.00	6.03	755.50	0.3950	1.307	1.247	0.593	-0.9180	-0.1690	75.348	-53.697

RUDDER DYNAMOMETER
epzj2x23.rud 1166 rpm 0m/s Rudder No. 2 X/D=0.39

Angle	V	RPM	Cl	Cn	Cd	Cmz	Cmx	Cmy	Cpc	Cps
-30.00	9.31	1166.72	-0.7230	-0.787	0.320	0.004	0.0600	0.1090	29.464	-17.164
-25.00	9.31	1166.72	-0.6330	-0.672	0.233	-0.024	0.0380	0.0830	33.524	-17.479
-20.00	9.31	1166.72	-0.4930	-0.514	0.147	-0.074	0.0640	0.0450	44.357	-26.178
-15.00	9.31	1166.72	-0.3260	-0.340	0.097	-0.059	0.0820	0.0210	47.313	-39.168
-10.00	9.31	1166.72	-0.2070	-0.212	0.047	-0.052	0.0880	0.0040	54.663	-57.786
-5.00	9.31	1166.72	-0.0890	-0.089	0.010	-0.041	0.0750	-0.0110	75.709	-102.052
0.00	9.31	1166.72	0.0230	0.023	0.003	-0.075	0.0603	-0.0153	-323.942	298.393
5.00	9.31	1166.72	0.1370	0.136	-0.004	-0.111	0.0750	-0.0180	-51.479	35.802
10.00	9.31	1166.72	0.2540	0.253	0.018	-0.125	0.0710	-0.0070	-19.290	9.484
15.00	9.31	1166.72	0.3790	0.384	0.069	-0.143	0.0870	0.0190	-7.346	5.742
20.00	9.31	1166.72	0.5040	0.514	0.120	-0.170	0.0930	0.0460	-3.114	2.570
25.00	9.31	1166.72	0.6280	0.645	0.179	-0.216	0.1190	0.0770	-3.505	4.178
30.00	9.31	1166.72	0.7420	0.768	0.251	-0.217	0.1230	0.1180	1.712	4.097
35.00	9.31	1166.72	0.8850	0.923	0.346	-0.222	0.1390	0.1620	5.957	4.891

RUDDER DYNAMOMETER
epzj2x24.rud 1166 rpm 0m/s Rudder No. 3 X/D=0.39

Angle	V	RPM	Cl	Cn	Cd	Cmz	Cmx	Cmy	Cpc	Cps
-30.00	9.32	1168.65	-0.6020	-0.655	0.268	0.447	0.0630	0.0620	-38.173	-18.217
-25.00	9.32	1168.65	-0.4940	-0.530	0.196	0.433	0.0480	0.0370	-51.721	-19.826
-20.00	9.32	1168.65	-0.3720	-0.392	0.124	0.454	0.0570	0.0270	-85.948	-26.004
-15.00	9.32	1168.65	-0.2890	-0.301	0.082	0.420	0.0590	0.0110	-109.645	-32.687
-10.00	9.32	1168.65	-0.1740	-0.175	0.022	0.370	0.0430	-0.0040	-181.525	-39.353
-5.00	9.32	1168.65	-0.1000	-0.099	0.003	0.360	0.0190	-0.0120	-331.899	-34.555
0.00	9.32	1168.65	0.0113	0.011	0.001	0.400	0.0133	-0.0143	5251.133	162.317
5.00	9.32	1168.65	0.1110	0.111	0.009	0.370	0.0220	-0.0120	363.250	4.231
10.00	9.32	1168.65	0.2150	0.217	0.033	0.352	0.0200	0.0000	191.660	-5.705
15.00	9.32	1168.65	0.3350	0.340	0.063	0.357	0.0240	0.0110	135.042	-7.044
20.00	9.32	1168.65	0.4550	0.464	0.106	0.328	0.0350	0.0260	100.680	-5.658
25.00	9.32	1168.65	0.5580	0.570	0.154	0.339	0.0370	0.0510	89.499	-4.884
30.00	9.32	1168.65	0.6600	0.682	0.220	0.338	0.0580	0.0730	79.618	-1.826
35.00	9.32	1168.65	0.7790	0.809	0.298	0.337	0.0550	0.1020	71.686	-1.815
40.00	9.32	1168.65	0.9040	0.949	0.400	0.341	0.0670	0.1510	65.900	1.043

RUDDER DYNAMOMETER
epzj3x25.rud 1460 rpm 0m/s Rudder No. 2 X/D=0.39

Angle	V	RPM	Cl	Cn	Cd	Cmz	Cmx	Cmy	Cpc	Cps
-30.00	11.57	1455.91	-0.7410	-0.794	0.304	0.157	-0.1350	0.1570	10.262	7.071
-25.00	11.57	1455.91	-0.6200	-0.652	0.212	0.167	-0.1010	0.1140	4.369	3.942

-20.00	11.57	1455.91	-0.4930	-0.506	0.126	0.169	-0.0610	0.0690	-3.333	-1.552
-15.00	11.57	1455.91	-0.3420	-0.349	0.072	0.149	-0.0150	0.0490	-12.609	-9.862
-10.00	11.57	1455.91	-0.2090	-0.212	0.031	0.092	0.0130	0.0280	-13.721	-21.095
-5.00	11.57	1455.91	-0.1140	-0.113	-0.009	0.071	0.0250	0.0030	-33.395	-39.237
0.00	11.57	1455.91	-0.0077	-0.008	-0.020	0.059	0.0470	0.0003	-2038.863	-1447.195
5.00	11.57	1455.91	0.1100	0.108	-0.016	0.038	0.0950	0.0000	65.549	69.600
10.00	11.57	1455.91	0.2330	0.232	0.012	0.016	0.1280	0.0160	36.768	38.253
15.00	11.57	1455.91	0.3620	0.361	0.046	0.003	0.1720	0.0410	30.794	31.477
20.00	11.57	1455.91	0.5020	0.502	0.088	-0.018	0.2290	0.0760	26.300	30.627
25.00	11.57	1455.91	0.6290	0.637	0.159	-0.058	0.2670	0.1170	20.818	28.319
30.00	11.57	1455.91	0.7430	0.758	0.229	-0.045	0.3100	0.1620	24.090	28.572
35.00	11.57	1455.91	0.8510	0.879	0.317	-0.045	0.3480	0.2140	24.855	28.915
40.00	11.57	1455.91	1.0000	1.053	0.447	-0.021	0.3910	0.2960	27.983	29.014

RUDDER DYNAMOMETER
epzj1x16.rud 750 rpm 0m/s Rudder No. 2 X/D=0.30

Angle	V	RPM	Cl	Cn	Cd	Cmz	Cmx	Cmy	Cpc	Cps
-30.00	6.03	755.52	-0.6220	-0.728	0.378	0.109	0.7390	0.0470	14.993	-102.165
-25.00	6.03	755.52	-0.5500	-0.628	0.307	0.104	0.6280	0.0370	13.341	-105.629
-20.00	6.03	755.52	-0.4070	-0.452	0.201	0.108	0.5250	0.0210	6.126	-125.167
-15.00	6.03	755.52	-0.2650	-0.295	0.149	-0.087	0.4340	0.0210	59.500	-157.806
-10.00	6.03	755.52	-0.1480	-0.165	0.111	-0.011	0.3180	0.0280	36.374	-204.382
-5.00	6.03	755.52	-0.0300	-0.038	0.090	0.033	0.1870	0.0290	-58.428	-504.584
0.00	6.03	755.52	0.0883	0.088	0.082	0.005	0.0793	0.0220	35.291	72.197
5.00	6.03	755.52	0.2060	0.213	0.085	-0.012	-0.0240	0.0200	24.329	-27.747
10.00	6.03	755.52	0.3470	0.359	0.100	-0.045	-0.1200	0.0240	17.508	-49.243
15.00	6.03	755.52	0.4640	0.478	0.115	-0.073	-0.2160	0.0280	14.622	-59.722
20.00	6.03	755.52	0.5810	0.607	0.180	-0.086	-0.3270	0.0450	15.865	-65.529
25.00	6.03	755.52	0.7190	0.756	0.246	-0.070	-0.4260	0.0720	20.771	-64.539
30.00	6.03	755.52	0.8350	0.888	0.329	-0.074	-0.5190	0.0860	21.674	-63.318
35.00	6.03	755.52	0.9510	1.025	0.429	-0.074	-0.6130	0.1060	22.785	-60.538
40.00	6.03	755.52	1.0660	1.168	0.546	-0.074	-0.7070	0.1270	23.668	-56.864

RUDDER DYNAMOMETER
epzj3x17.rud 1460 rpm 0m/s Rudder No. 2 X/D=0.30

Angle	V	RPM	Cl	Cn	Cd	Cmz	Cmx	Cmy	Cpc	Cps
-30.00	11.58	1457.59	-0.7530	-0.827	0.350	0.119	-0.1630	0.1530	15.631	8.788
-25.00	11.58	1457.59	-0.6440	-0.693	0.259	0.114	-0.1270	0.1130	13.570	6.005
-20.00	11.58	1457.59	-0.4930	-0.525	0.182	0.100	-0.0810	0.0800	10.905	2.296
-15.00	11.58	1457.59	-0.3600	-0.378	0.118	0.089	-0.0390	0.0490	6.507	-4.135
-10.00	11.58	1457.59	-0.2340	-0.242	0.069	0.067	-0.0060	0.0300	2.523	-12.974
-5.00	11.58	1457.59	-0.1270	-0.129	0.033	0.045	0.0220	0.0100	-5.196	-33.441
0.00	11.58	1457.59	0.0193	0.019	0.023	0.018	0.0593	0.0007	148.668	356.640
5.00	11.58	1457.59	0.1470	0.150	0.040	-0.004	0.1060	0.0060	27.278	53.500
10.00	11.58	1457.59	0.2830	0.288	0.055	-0.028	0.1540	0.0210	20.244	36.476
15.00	11.58	1457.59	0.4050	0.413	0.084	-0.048	0.2000	0.0400	18.478	31.808
20.00	11.58	1457.59	0.5390	0.553	0.136	-0.068	0.2470	0.0720	17.699	28.822
25.00	11.58	1457.59	0.6720	0.698	0.211	-0.078	0.2960	0.1230	18.771	28.358
30.00	11.58	1457.59	0.7990	0.835	0.286	-0.088	0.3390	0.1740	19.495	28.082
35.00	11.58	1457.59	0.9310	0.980	0.379	-0.085	0.3810	0.2260	21.350	27.613

40.00	11.58	1457.59	1.0380	1.113	0.495	-0.078	0.4070	0.2960	22.953	27.581

RUDDER DYNAMOMETER
epzj1x39.rud 750 rpm 0m/s Rudder No. 2 X/D=0.52

Angle	V	RPM	Cl	Cn	Cd	Cmz	Cmx	Cmy	Cpc	Cps
-30.00	6.01	753.53	-0.5150	-0.623	0.354	0.086	0.7460	-1.9670	16.162	-279.090
-25.00	6.01	753.53	-0.4420	-0.513	0.265	0.085	0.6510	-1.9770	13.303	-295.626
-20.00	6.01	753.53	-0.2720	-0.322	0.194	0.048	0.5490	-2.0370	15.234	-393.694
-15.00	6.01	753.53	-0.1780	-0.207	0.139	0.015	0.4220	-2.0130	22.976	-465.193
-10.00	6.01	753.53	-0.0310	-0.049	0.103	-0.007	0.3110	-2.0690	44.305	-1383.499
-5.00	6.01	753.53	0.1110	0.104	0.082	-0.008	0.1810	-2.0720	22.701	330.420
0.00	6.01	753.53	0.2023	0.202	0.061	-0.062	0.0843	-1.9990	-0.797	24.312
5.00	6.01	753.53	0.3440	0.348	0.059	-0.061	-0.0090	-2.0080	12.506	-70.317
10.00	6.01	753.53	0.4840	0.490	0.073	-0.085	-0.1150	-1.9740	12.523	-110.678
15.00	6.01	753.53	0.5810	0.584	0.088	-0.115	-0.2210	-1.9970	10.358	-142.520
20.00	6.01	753.53	0.6970	0.702	0.137	-0.164	-0.3220	-1.9560	6.678	-155.830
25.00	6.01	753.53	0.8190	0.828	0.204	-0.164	-0.4430	-1.9920	10.132	-167.627
30.00	6.01	753.53	0.9560	0.971	0.287	-0.193	-0.5310	-1.9310	10.154	-164.261
35.00	6.01	753.53	1.0500	1.073	0.371	-0.197	-0.6340	-1.9240	11.637	-168.736
40.00	6.01	753.53	1.1430	1.179	0.471	-0.172	-0.7560	-1.8930	15.359	-169.909

RUDDER DYNAMOMETER
epzj3x39.rud 1460 rpm 0m/s Rudder No. 2 X/D=0.52

Angle	V	RPM	Cl	Cn	Cd	Cmz	Cmx	Cmy	Cpc	Cps
-30.00	11.61	1461.45	-0.7510	-0.797	0.293	0.065	-0.1460	-0.4850	21.846	-32.045
-25.00	11.61	1461.45	-0.6010	-0.630	0.202	0.057	-0.1070	-0.4880	20.941	-34.903
-20.00	11.61	1461.45	-0.4590	-0.471	0.115	0.057	-0.0390	-0.4930	17.896	-45.470
-15.00	11.61	1461.45	-0.3280	-0.332	0.056	0.032	-0.0140	-0.4930	20.456	-51.871
-10.00	11.61	1461.45	-0.2160	-0.216	0.019	0.014	0.0060	-0.4940	23.526	-59.956
-5.00	11.61	1461.45	-0.0730	-0.072	-0.007	-0.006	0.0360	-0.4980	38.080	-127.270
0.00	11.61	1461.45	0.0267	0.027	-0.020	-0.032	0.0747	-0.5097	-166.373	388.509
5.00	11.61	1461.45	0.1560	0.155	-0.009	-0.057	0.1130	-0.5070	-7.005	26.297
10.00	11.61	1461.45	0.2740	0.270	0.001	-0.080	0.1420	-0.4970	0.218	2.529
15.00	11.61	1461.45	0.3860	0.382	0.035	-0.102	0.1890	-0.5110	3.204	-4.443
20.00	11.61	1461.45	0.5280	0.520	0.069	-0.122	0.2390	-0.5210	6.552	-8.537
25.00	11.61	1461.45	0.6580	0.653	0.136	-0.134	0.2890	-0.5180	9.512	-10.966
30.00	11.61	1461.45	0.7740	0.776	0.211	-0.144	0.3180	-0.5030	11.362	-14.411
35.00	11.61	1461.45	0.9100	0.915	0.295	-0.144	0.3620	-0.5110	14.210	-17.135
40.00	11.61	1461.45	1.0400	1.062	0.412	-0.132	0.3950	-0.5120	17.539	-19.988

RUDDER DYNAMOMETER
epzj3y210.rud 1460 rpm 0m/s Rudder No. 2 Y/D=0.25

Angle	V	RPM	Cl	Cn	Cd	Cmz	Cmx	Cmy	Cpc	Cps
-30.00	11.57	1455.82	-0.5200	-0.588	0.275	0.139	0.0290	-0.3670	6.287	-52.957
-25.00	11.57	1455.82	-0.4380	-0.482	0.201	0.117	0.0490	-0.3690	5.664	-59.072
-20.00	11.57	1455.82	-0.2740	-0.305	0.140	0.191	0.0680	-0.3840	-32.464	-81.421
-15.00	11.57	1455.82	-0.1480	-0.167	0.093	0.200	0.0880	-0.3870	-89.858	-128.125
-10.00	11.57	1455.82	-0.0100	-0.023	0.075	0.201	0.1270	-0.3890	-837.657	-847.601

-5.00	11.57	1455.82	0.1340	0.127	0.072	0.208	0.1660	-0.3950	193.435	139.554
0.00	11.57	1455.82	0.2260	0.226	0.072	0.181	0.1860	-0.3643	109.892	64.963
5.00	11.57	1455.82	0.3320	0.339	0.091	0.153	0.2110	-0.3610	75.167	35.342
10.00	11.57	1455.82	0.4270	0.439	0.111	0.142	0.2200	-0.3600	62.355	17.510
15.00	11.57	1455.82	0.5200	0.538	0.135	0.099	0.2460	-0.3550	48.473	9.609
20.00	11.57	1455.82	0.6070	0.632	0.178	0.089	0.2570	-0.3440	44.003	2.030
25.00	11.57	1455.82	0.6950	0.725	0.225	0.067	0.2640	-0.3400	39.172	-4.279
30.00	11.57	1455.82	0.7820	0.823	0.291	0.047	0.2820	-0.3350	35.687	-8.165
35.00	11.57	1455.82	0.8370	0.901	0.376	0.035	0.2760	-0.3140	33.881	-12.384
40.00	11.57	1455.82	0.8390	0.935	0.454	0.032	0.2300	-0.3200	33.382	-20.685

RUDDER DYNAMOMETER
epzj3y111.rud 1460 rpm 0m/s Rudder No. 2 Y/D=0.125

Angle	V	RPM	Cl	Cn	Cd	Cmz	Cmx	Cmy	Cpc	Cps
-30.00	11.59	1458.44	-0.6660	-0.737	0.321	0.061	-0.0900	0.1310	21.779	1.976
-25.00	11.59	1458.44	-0.5620	-0.610	0.239	0.051	-0.0730	0.0730	21.635	-1.561
-20.00	11.59	1458.44	-0.4850	-0.519	0.184	0.041	-0.0660	0.0550	22.136	-1.846
-15.00	11.59	1458.44	-0.4210	-0.442	0.137	0.010	-0.0850	0.0440	27.825	3.678
-10.00	11.59	1458.44	-0.3320	-0.345	0.105	-0.019	-0.0840	0.0280	35.601	7.995
-5.00	11.59	1458.44	-0.2000	-0.206	0.073	-0.034	-0.0530	0.0120	46.492	8.491
0.00	11.59	1458.44	-0.0940	-0.094	0.054	-0.043	-0.0110	0.0053	76.074	-4.464
5.00	11.59	1458.44	0.0240	0.029	0.057	-0.057	0.0290	0.0070	-167.109	85.834
10.00	11.59	1458.44	0.1780	0.187	0.064	-0.077	0.0920	0.0180	-11.099	32.792
15.00	11.59	1458.44	0.3010	0.315	0.093	-0.091	0.1420	0.0420	1.142	29.481
20.00	11.59	1458.44	0.4360	0.454	0.131	-0.096	0.1870	0.0680	8.867	26.369
25.00	11.59	1458.44	0.5630	0.590	0.187	-0.099	0.2220	0.1060	13.244	24.199
30.00	11.59	1458.44	0.6900	0.731	0.267	-0.093	0.2800	0.1530	17.327	26.123
35.00	11.59	1458.44	0.8340	0.895	0.370	-0.078	0.3310	0.2200	21.223	26.944
40.00	11.59	1458.44	0.9470	1.041	0.490	-0.056	0.3540	0.2820	24.645	26.003

RUDDER DYNAMOMETER
ep4qp16.rud Quad I 804 rpm 10m/s Rudder No. 2 X/D=0.39

Angle	V	RPM	Cl	Cn	Cd	Cmz	Cmx	Cmy	Cpc	Cps
-30.00	10.00	804.67	-1.2140	-1.307	0.512	-0.047	-0.8890	0.3020	33.600	52.958
-25.00	10.00	804.67	-1.5100	-1.519	0.355	0.033	-1.0350	0.2230	27.837	50.453
-20.00	10.00	804.67	-1.2780	-1.280	0.232	0.054	-0.8450	0.1450	25.785	48.395
-15.00	10.00	804.67	-0.9490	-0.954	0.141	0.054	-0.6170	0.0910	24.369	47.457
-10.00	10.00	804.67	-0.6220	-0.628	0.086	0.045	-0.3930	0.0570	22.836	45.666
-5.00	10.00	804.67	-0.3120	-0.316	0.056	0.028	-0.1860	0.0370	21.227	42.369
0.00	10.00	804.67	-0.0350	-0.035	0.042	0.005	0.0030	0.0290	14.480	-25.631
5.00	10.00	804.67	0.2410	0.245	0.060	-0.021	0.1860	0.0340	21.451	59.451
10.00	10.00	804.67	0.5400	0.548	0.096	-0.041	0.3850	0.0520	22.588	53.278
15.00	10.00	804.67	0.8460	0.859	0.162	-0.048	0.5920	0.0850	24.350	51.677
20.00	10.00	804.67	1.1180	1.135	0.246	-0.046	0.7900	0.1360	25.938	52.001
25.00	10.00	804.67	1.3470	1.381	0.378	-0.026	0.9690	0.2130	28.122	52.666
30.00	10.00	804.67	1.5340	1.590	0.521	0.009	1.1220	0.3030	30.554	53.141

RUDDER DYNAMOMETER
ep4qp2.rud Quad I 406 rpm 10m/s Rudder No. 2 X/D=0.39

Angle	V	RPM	Cl	Cn	Cd	Cmz	Cmx	Cmy	Cpc	Cps
-30.00	10.00	403.96	-0.8657	-0.944	0.388	-0.042	-0.5507	0.2003	34.417	43.663
-25.00	10.00	406.49	-0.9990	-1.006	0.238	0.000	-0.6890	0.1120	29.972	49.316
-20.00	10.00	403.96	-0.8143	-0.818	0.153	0.018	-0.5620	0.0683	27.741	49.943
-15.00	10.00	406.49	-0.6280	-0.625	0.074	0.027	-0.4350	0.0320	25.651	51.001
-10.00	10.00	403.96	-0.3833	-0.384	0.040	0.025	-0.2833	0.0130	23.610	55.660
-5.00	10.00	406.49	-0.1780	-0.178	0.008	0.011	-0.1510	0.0010	23.653	67.150
0.00	10.00	403.96	0.0423	0.042	0.004	0.002	-0.0110	-0.0037	33.796	-45.070
5.00	10.00	406.49	0.2450	0.244	0.004	-0.016	0.1270	-0.0030	23.531	34.135
10.00	10.00	403.96	0.4623	0.463	0.040	-0.023	0.2667	0.0107	24.957	39.722
15.00	10.00	406.49	0.6570	0.654	0.078	-0.023	0.3960	0.0310	26.397	42.240
20.00	10.00	403.96	0.7363	0.750	0.170	0.007	0.4487	0.0803	30.906	42.450
25.00	10.00	406.49	0.7190	0.783	0.310	0.045	0.4650	0.1550	35.726	44.734
30.00	10.00	403.96	0.7233	0.836	0.420	0.059	0.4623	0.2030	36.991	42.522
35.00	10.00	406.49	0.7040	0.856	0.487	0.069	0.4790	0.2360	38.077	44.151
40.00	10.00	406.49	0.7420	0.940	0.578	0.083	0.4920	0.2690	38.788	40.988

RUDDER DYNAMOMETER
ep4qp36.rud Quad I 208 rpm 10m/s Rudder No. 2 X/D=0.39

Angle	V	RPM	Cl	Cn	Cd	Cmz	Cmx	Cmy	Cpc	Cps
-35.00	10.00	208.19	-0.8370	-0.947	0.456	-0.066	-0.5180	0.2130	36.973	40.202
-30.00	10.00	208.19	-0.7520	-0.825	0.348	-0.044	-0.4600	0.1640	35.264	40.774
-20.00	10.00	208.19	-0.6710	-0.681	0.147	-0.009	-0.4290	0.0650	31.250	44.998
-10.00	10.00	208.19	-0.3730	-0.370	0.011	0.018	-0.2700	0.0030	25.027	54.472
0.00	10.00	208.19	0.0420	0.042	-0.018	0.003	-0.0030	-0.0120	36.399	-25.169
10.00	10.00	208.19	0.4470	0.444	0.019	-0.010	0.2590	0.0020	27.815	39.945
20.00	10.00	208.19	0.5380	0.559	0.156	0.025	0.3700	0.0740	34.441	49.233
30.00	10.00	208.19	0.6540	0.739	0.346	0.057	0.4210	0.1550	37.629	42.284

RUDDER DYNAMOMETER
ep4qp46.rud Quad I 0 rpm 10m/s Rudder No. 2 X/D=0.39

Angle	V	RPM	Cl	Cn	Cd	Cmz	Cmx	Cmy	Cpc	Cps
-35.00	10.00	0.09	-0.6860	-0.786	0.391	-0.113	-0.4790	0.1760	44.363	45.297
-30.00	10.00	0.09	-0.8130	-0.834	0.261	-0.070	-0.5350	0.1230	38.419	45.428
-20.00	10.00	0.09	-0.5230	-0.520	0.083	-0.039	-0.3370	0.0480	37.513	46.599
-10.00	10.00	0.09	-0.2910	-0.279	-0.041	-0.002	-0.1890	-0.0180	30.721	48.082
0.00	10.00	0.09	-0.0200	-0.020	-0.098	0.001	-0.0240	-0.0590	26.738	102.287
10.00	10.00	0.09	0.2380	0.229	-0.032	0.017	0.1570	-0.0360	37.536	47.313
20.00	10.00	0.09	0.4830	0.492	0.112	0.048	0.3200	0.0460	39.655	46.779
30.00	10.00	0.09	0.6390	0.701	0.296	0.087	0.4220	0.1400	42.351	44.572
40.00	10.00	0.09	0.7040	0.856	0.493	0.123	0.4890	0.2270	44.330	43.299

RUDDER DYNAMOMETER
ep4qp38.rud Quad I 403 rpm 20m/s Rudder No. 2 X/D=0.39

Angle	V	RPM	Cl	Cn	Cd	Cmz	Cmx	Cmy	Cpc	Cps
-30.00	20.00	404.02	-0.9260	-0.995	0.386	-0.045	-0.6110	0.2340	34.530	47.460
-20.00	20.00	404.02	-0.8230	-0.824	0.148	0.004	-0.5520	0.0820	29.545	48.932
-10.00	20.00	404.02	-0.4010	-0.400	0.026	0.018	-0.2970	0.0120	25.453	56.103
0.00	20.00	404.02	0.0510	0.051	-0.008	0.003	-0.0070	-0.0090	35.418	-31.570
10.00	20.00	404.02	0.4890	0.486	0.024	-0.011	0.2790	0.0130	27.646	39.423
20.00	20.00	404.02	0.6830	0.702	0.175	0.013	0.4050	0.0990	31.877	41.522
30.00	20.00	404.02	0.7660	0.848	0.369	0.058	0.4660	0.2230	36.775	43.265

RUDDER DYNAMOMETER
ep4qp28.rud Quad I 808 rpm 20m/s Rudder No. 2 X/D=0.39

Angle	V	RPM	Cl	Cn	Cd	Cmz	Cmx	Cmy	Cpc	Cps
-30.00	20.00	808.06	-1.1540	-1.190	0.380	-0.019	-0.7740	0.2300	31.613	48.505
-20.00	20.00	808.06	-0.8740	-0.875	0.159	0.018	-0.6170	0.0920	27.954	52.308
-10.00	20.00	808.06	-0.4220	-0.421	0.030	0.027	-0.3150	0.0140	23.604	56.683
0.00	20.00	808.06	0.0490	0.049	-0.006	0.001	-0.0140	-0.0070	31.144	-46.336
10.00	20.00	808.06	0.5140	0.511	0.026	-0.023	0.2890	0.0140	25.412	38.751
20.00	20.00	808.06	0.8030	0.812	0.168	-0.001	0.5190	0.1080	29.914	47.109
30.00	20.00	808.06	0.8340	0.928	0.412	0.059	0.5300	0.2420	36.389	44.962

RUDDER DYNAMOMETER
ep4qp58.rud Quad II -404 rpm 20m/s Rudder No. 2 X/D=0.39

Angle	V	RPM	Cl	Cn	Cd	Cmz	Cmx	Cmy	Cpc	Cps
-30.00	20.00	-403.38	-0.8230	-0.871	0.315	-0.057	-0.5240	0.1740	36.575	44.661
-20.00	20.00	-403.38	-0.6090	-0.606	0.099	-0.017	-0.3920	0.0430	32.832	45.634
-10.00	20.00	-403.38	-0.2660	-0.253	-0.051	0.003	-0.2030	-0.0470	28.786	58.065
0.00	20.00	-403.38	0.0910	0.091	-0.089	-0.003	0.0310	-0.0660	27.145	16.248
10.00	20.00	-403.38	0.4350	0.421	-0.041	-0.003	0.2620	-0.0300	29.233	42.462
20.00	20.00	-403.38	0.6790	0.671	0.097	0.018	0.4340	0.0660	32.669	46.627
30.00	20.00	-403.38	0.8270	0.864	0.296	0.046	0.5430	0.1860	35.305	47.731

RUDDER DYNAMOMETER
ep4qp68.rud Quad II -808 rpm 20m/s Rudder No. 2 X/D=0.39

Angle	V	RPM	Cl	Cn	Cd	Cmz	Cmx	Cmy	Cpc	Cps
-30.00	20.00	-806.55	-0.2340	-0.250	0.095	-0.030	-0.1520	0.0320	42.012	41.543
-20.00	20.00	-806.55	-0.1630	-0.160	0.019	-0.010	-0.1240	-0.0040	36.536	54.676
-10.00	20.00	-806.55	-0.0970	-0.087	-0.047	-0.006	-0.0920	-0.0360	36.546	78.553
0.00	20.00	-806.55	0.0190	0.019	-0.068	-0.018	-0.0250	-0.0550	-62.812	-145.253
10.00	20.00	-806.55	0.0750	0.064	-0.056	-0.013	-0.0100	-0.0560	9.514	-48.161
20.00	20.00	-806.55	0.2120	0.189	-0.032	-0.005	0.0430	-0.0500	27.552	-5.214
30.00	20.00	-806.55	0.3330	0.326	0.076	0.025	0.1310	0.0010	37.766	17.365

RUDDER DYNAMOMETER
ep4qp57.rud Quad II -213 rpm 10m/s Rudder No. 2 X/D=0.39

Angle	V	RPM	Cl	Cn	Cd	Cmz	Cmx	Cmy	Cpc	Cps
-35.00	10.00	-212.72	-0.8370	-0.917	0.404	-0.076	-0.5280	0.1650	38.228	39.939
-30.00	10.00	-212.72	-0.7680	-0.807	0.282	-0.052	-0.4780	0.1160	36.374	41.031
-20.00	10.00	-212.72	-0.5570	-0.556	0.095	-0.012	-0.3580	0.0250	32.123	44.549
-10.00	10.00	-212.72	-0.2500	-0.240	-0.035	0.002	-0.1850	-0.0410	29.126	55.624
0.00	10.00	-212.72	0.0860	0.086	-0.072	-0.005	0.0360	-0.0550	24.208	24.297
10.00	10.00	-212.72	0.4110	0.401	-0.017	-0.006	0.2550	-0.0300	28.575	43.911
20.00	10.00	-212.72	0.6260	0.627	0.114	0.016	0.3850	0.0400	32.505	42.365
30.00	10.00	-212.72	0.7410	0.780	0.276	0.042	0.4770	0.1230	35.340	43.331
40.00	10.00	-212.72	0.7180	0.849	0.466	0.091	0.4880	0.2080	40.689	42.230

RUDDER DYNAMOMETER
ep4qp6.rud Quad II -407 rpm 10m/s Rudder No. 2 X/D=0.39

Angle	V	RPM	Cl	Cn	Cd	Cmz	Cmx	Cmy	Cpc	Cps
-35.00	10.00	-407.89	-0.3110	-0.345	0.157	-0.057	-0.1600	-0.0050	46.402	19.608
-30.00	10.00	-405.89	-0.1717	-0.177	0.056	-0.055	-0.1063	0.1970	63.182	97.650
-20.00	10.00	-405.98	-0.1490	-0.144	0.013	-0.014	-0.0877	-0.0300	40.006	31.087
-10.00	10.00	-405.98	-0.1313	-0.123	-0.035	-0.013	-0.1063	-0.0340	40.825	62.864
0.00	10.00	-405.98	0.0613	0.061	-0.037	-0.001	-0.0153	-0.0323	41.089	237.428
10.00	10.00	-405.89	0.1983	0.188	-0.040	-0.018	0.0537	0.1883	24.370	22.333
20.00	10.00	-405.89	0.1817	0.162	-0.024	-0.019	0.0670	0.1753	15.847	68.000
30.00	10.00	-405.89	0.2770	0.261	0.043	0.001	0.1203	0.1763	30.308	56.053
40.00	10.00	-407.89	0.3520	0.400	0.202	0.060	0.1750	-0.0180	44.976	13.040

RUDDER DYNAMOMETER
ep4qp7.rud Quad II -804 rpm 10m/s Rudder No. 2 X/D=0.39

Angle	V	RPM	Cl	Cn	Cd	Cmz	Cmx	Cmy	Cpc	Cps
-35.00	10.00	-804.66	0.0260	0.182	-0.280	-0.035	-0.0100	-0.2430	10.833	54.394
-30.00	10.00	-805.57	0.1360	0.273	-0.312	-0.010	0.0540	-0.2487	26.074	45.360
-25.00	10.00	-804.66	0.2150	0.333	-0.327	-0.010	0.0720	-0.2440	26.939	32.910
-20.00	10.00	-805.57	0.2240	0.314	-0.303	0.009	0.0907	-0.2113	32.655	33.319
-15.00	10.00	-804.66	0.1360	0.197	-0.255	-0.002	0.0380	-0.1660	28.945	22.934
-10.00	10.00	-805.57	0.1037	0.139	-0.214	-0.007	0.0193	-0.1370	25.056	13.138
-5.00	10.00	-804.66	0.0340	0.053	-0.214	-0.010	-0.0170	-0.1220	10.477	-28.823
0.00	10.00	-805.57	-0.0410	-0.041	-0.195	-0.018	-0.0520	-0.1407	92.993	176.608
5.00	10.00	-804.66	-0.0870	-0.105	-0.210	-0.022	-0.0950	-0.1400	51.283	84.562
10.00	10.00	-805.57	-0.0797	-0.118	-0.226	-0.036	-0.0930	-0.1660	64.289	92.381
15.00	10.00	-804.66	-0.0840	-0.140	-0.227	-0.028	-0.0770	-0.1830	50.339	69.425
20.00	10.00	-805.57	-0.0423	-0.119	-0.232	-0.023	-0.0857	-0.1920	52.500	123.690
25.00	10.00	-804.66	-0.0170	-0.101	-0.201	-0.013	-0.0570	-0.2010	42.528	117.764
30.00	10.00	-805.57	0.0433	-0.057	-0.188	-0.006	-0.0250	-0.2113	57.418	296.792
35.00	10.00	-804.66	0.1070	0.005	-0.144	0.026	0.0140	-0.2310	549.887	-2400.940
40.00	10.00	-804.66	0.1550	0.054	-0.100	0.047	0.0510	-0.2200	116.674	-206.362

RUDDER DYNAMOMETER
ep4qp87.rud Quad II -1453 rpm 10m/s Rudder No. 2 X/D=0.39

Angle	V	RPM	Cl	Cn	Cd	Cmz	Cmx	Cmy	Cpc	Cps
-35.00	10.00	-1453.39	-0.0690	0.381	-0.762	-0.125	-0.0240	-0.5060	-2.907	53.475
-30.00	10.00	-1453.39	-0.0420	0.301	-0.675	-0.131	-0.0100	-0.5430	-13.658	69.903
-25.00	10.00	-1453.39	0.1690	0.460	-0.725	-0.134	0.0080	-0.4810	0.871	28.189
-20.00	10.00	-1453.39	0.2750	0.484	-0.659	-0.052	-0.0220	-0.4590	19.162	10.655
-15.00	10.00	-1453.39	0.2700	0.435	-0.675	-0.059	0.1030	-0.4250	16.455	30.524
-10.00	10.00	-1453.39	0.2130	0.324	-0.657	-0.002	0.0910	-0.4440	29.227	33.983
-5.00	10.00	-1453.39	0.2280	0.279	-0.590	0.006	0.0480	-0.4180	32.307	12.758
0.00	10.00	-1453.39	0.1850	0.185	-0.567	0.040	0.0460	-0.3900	51.736	7.361
5.00	10.00	-1453.39	0.1780	0.129	-0.553	0.049	0.0680	-0.4140	67.911	7.344
10.00	10.00	-1453.39	0.0840	-0.008	-0.523	0.080	0.0680	-0.3900	-997.876	-2.698
15.00	10.00	-1453.39	0.1190	-0.007	-0.471	0.100	-0.0540	-0.3800	-1464.212	2232.121
20.00	10.00	-1453.39	0.0800	-0.101	-0.517	0.123	0.0390	-0.4480	-90.916	97.412
25.00	10.00	-1453.39	0.0940	-0.132	-0.513	0.111	0.0040	-0.3910	-54.667	105.379
30.00	10.00	-1453.39	0.0350	-0.217	-0.493	0.123	-0.0370	-0.4870	-27.024	109.606
35.00	10.00	-1453.39	0.1130	-0.170	-0.457	0.162	0.1830	-0.4990	-65.424	62.545
40.00	10.00	-1453.39	0.1940	-0.206	-0.552	0.178	0.1390	-0.4530	-56.314	72.315

RUDDER DYNAMOMETER
ep4qp930.rud Quad III -2105 rpm -10m/s Rudder No. 2 X/D=0.39

Angle	V	RPM	Cl	Cn	Cd	Cmz	Cmx	Cmy	Cpc	Cps
-30.00	10.00	-2105.90	1.5030	1.864	-1.126	0.591	1.0600	-0.8070	61.663	53.363
-25.00	10.00	-2105.90	1.3910	1.628	-0.870	0.529	0.9740	-0.6040	62.455	52.423
-20.00	10.00	-2105.90	1.2470	1.393	-0.646	0.472	0.8640	-0.4150	63.897	50.983
-15.00	10.00	-2105.90	0.9970	1.067	-0.403	0.432	0.7220	-0.2490	70.433	53.882
-10.00	10.00	-2105.90	0.8110	0.848	-0.283	0.316	0.5780	-0.1550	67.220	52.803
-5.00	10.00	-2105.90	0.4810	0.498	-0.220	0.153	0.3540	-0.1000	60.605	54.931
0.00	10.00	-2105.90	0.1440	0.144	-0.194	-0.004	0.1360	-0.0760	27.434	76.899
5.00	10.00	-2105.90	-0.2150	-0.228	-0.156	-0.150	-0.1220	-0.0690	95.748	38.618
10.00	10.00	-2105.90	-0.5720	-0.593	-0.172	-0.320	-0.3530	-0.1120	83.978	44.481
15.00	10.00	-2105.90	-0.8510	-0.893	-0.274	-0.465	-0.5420	-0.1950	81.988	46.772
20.00	10.00	-2105.90	-1.0690	-1.169	-0.479	-0.537	-0.6990	-0.3470	75.912	48.858
25.00	10.00	-2105.90	-1.2750	-1.484	-0.777	-0.575	-0.8300	-0.5520	68.690	48.910
30.00	10.00	-2105.90	-1.5100	-1.871	-1.126	-0.633	-1.0310	-0.7920	63.836	51.375
35.00	10.00	-2105.90	-1.7240	-2.239	-1.440	-0.718	-1.1170	-1.0140	62.052	49.364
40.00	10.00	-2105.90	-1.8280	-2.548	-1.786	-0.807	-1.2190	-1.2670	61.669	51.098

RUDDER DYNAMOMETER
ep4qp10.rud Quad III -1460 rpm -10m/s Rudder No. 2 X/D=0.39

Angle	V	RPM	Cl	Cn	Cd	Cmz	Cmx	Cmy	Cpc	Cps
-35.00	10.00	-1463.59	1.3020	1.749	-1.190	0.547	0.9300	-0.8610	61.280	54.321
-30.00	10.00	-1461.44	1.2163	1.492	-0.876	0.486	0.8427	-0.6777	62.574	54.175
-25.00	10.00	-1463.59	1.1470	1.338	-0.707	0.435	0.8110	-0.5110	62.462	53.538
-20.00	10.00	-1461.44	1.0707	1.163	-0.458	0.419	0.7530	-0.3623	66.018	54.007
-15.00	10.00	-1463.59	0.9450	1.000	-0.337	0.401	0.6750	-0.2110	70.118	53.158
-10.00	10.00	-1461.44	0.7837	0.793	-0.120	0.322	0.5293	-0.1237	70.595	50.977

-5.00	10.00	-1463.59	0.4620	0.474	-0.160	0.156	0.3320	-0.0640	62.861	53.336
0.00	10.00	-1460.92	0.0987	0.099	-0.069	0.011	0.0800	-0.0353	40.136	37.592
5.00	10.00	-1463.59	-0.2100	-0.217	-0.094	-0.144	-0.1160	-0.0370	96.200	37.384
10.00	10.00	-1461.44	-0.5203	-0.526	-0.077	-0.295	-0.3390	-0.0847	85.987	48.931
15.00	10.00	-1463.59	-0.8200	-0.859	-0.256	-0.437	-0.5360	-0.1690	80.826	47.855
20.00	10.00	-1461.44	-1.0003	-1.083	-0.418	-0.456	-0.6570	-0.3290	72.082	49.943
25.00	10.00	-1463.59	-1.1800	-1.372	-0.716	-0.495	-0.7980	-0.5090	66.077	50.921
30.00	10.00	-1461.44	-1.2967	-1.579	-0.912	-0.545	-0.8830	-0.6763	64.495	52.347
35.00	10.00	-1463.59	-1.3200	-1.745	-1.158	-0.597	-0.8720	-0.8410	64.193	51.046
40.00	10.00	-1463.59	-1.2340	-1.842	-1.395	-0.627	-0.7850	-1.0110	64.004	50.440

RUDDER DYNAMOMETER
ep4qp11.rud Quad III -804 rpm -10m/s Rudder No. 2 X/D=0.39

Angle	V	RPM	Cl	Cn	Cd	Cmz	Cmx	Cmy	Cpc	Cps
-30.00	10.00	-804.34	0.9565	1.162	-0.667	0.409	0.6710	-0.5450	65.235	56.012
-25.00	10.00	-805.24	0.8770	1.014	-0.520	0.354	0.6310	-0.3920	64.885	55.204
-20.00	10.00	-804.64	0.8257	0.892	-0.340	0.331	0.5877	-0.3003	67.062	55.983
-15.00	10.00	-805.24	0.8460	0.882	-0.252	0.351	0.5890	-0.1800	69.744	52.295
-10.00	10.00	-804.64	0.7523	0.760	-0.111	0.318	0.5037	-0.0970	71.785	49.985
-5.00	10.00	-805.24	0.4360	0.442	-0.092	0.155	0.3050	-0.0400	64.978	52.028
0.00	10.00	-804.64	0.0750	0.075	-0.034	0.002	0.0543	-0.0170	-15.637	64.911
5.00	10.00	-805.24	-0.1780	-0.184	-0.069	-0.138	-0.0960	-0.0150	104.853	35.376
10.00	10.00	-804.64	-0.5057	-0.503	-0.030	-0.283	-0.3270	-0.0637	86.437	48.753
15.00	10.00	-805.24	-0.7730	-0.801	-0.212	-0.401	-0.5090	-0.1520	80.061	48.822
20.00	10.00	-804.64	-0.7783	-0.839	-0.313	-0.356	-0.5480	-0.2903	72.560	55.972
25.00	10.00	-805.24	-0.8770	-1.036	-0.571	-0.404	-0.6070	-0.4020	69.038	52.008
30.00	10.00	-804.64	-0.9350	-1.164	-0.709	-0.431	-0.6413	-0.5420	67.039	53.548

RUDDER DYNAMOMETER
ep4qp1230.rud Quad III -402 rpm -10m/s Rudder No. 2 X/D=0.39

Angle	V	RPM	Cl	Cn	Cd	Cmz	Cmx	Cmy	Cpc	Cps
-20.00	10.00	-402.58	0.6710	0.738	-0.314	0.274	0.4930	-0.2540	67.099	57.066
-15.00	10.00	-402.58	0.7710	0.799	-0.209	0.310	0.5400	-0.1710	68.752	53.262
-10.00	10.00	-402.58	0.7160	0.724	-0.107	0.301	0.4880	-0.0830	71.506	50.927
-5.00	10.00	-402.58	0.4190	0.421	-0.049	0.155	0.2930	-0.0310	66.737	52.327
0.00	10.00	-402.58	0.1230	0.123	-0.022	0.010	0.1000	-0.0100	38.340	63.462
5.00	10.00	-402.58	-0.1790	-0.182	-0.045	-0.137	-0.1020	-0.0080	105.498	38.928
10.00	10.00	-402.58	-0.5350	-0.538	-0.067	-0.303	-0.3400	-0.0560	86.330	46.481
15.00	10.00	-402.58	-0.7740	-0.796	-0.187	-0.385	-0.4930	-0.1470	78.376	47.153
20.00	10.00	-402.58	-0.6920	-0.764	-0.334	-0.328	-0.4690	-0.2540	72.884	51.513
25.00	10.00	-402.58	-0.7100	-0.844	-0.475	-0.347	-0.4730	-0.3500	71.059	50.872

RUDDER DYNAMOMETER
ep4qp1330.rud Quad IV 0 rpm -10m/s Rudder No. 2 X/D=0.39

Angle	V	RPM	Cl	Cn	Cd	Cmz	Cmx	Cmy	Cpc	Cps
-20.00	10.00	0.09	0.6130	0.677	-0.297	0.274	0.4650	-0.2540	70.404	59.776
-15.00	10.00	0.09	0.7550	0.780	-0.197	0.316	0.5380	-0.1730	70.459	54.807
-10.00	10.00	0.09	0.7000	0.702	-0.076	0.309	0.4640	-0.0790	74.031	49.571

0.00	10.00	0.09	0.2420	0.242	-0.027	0.090	0.1840	-0.0200	60.459	57.513
5.00	10.00	0.09	-0.1300	-0.133	-0.044	-0.118	-0.0780	-0.0060	118.946	41.511
10.00	10.00	0.09	-0.4610	-0.474	-0.116	-0.274	-0.3010	-0.0500	87.765	46.763
15.00	10.00	0.09	-0.6910	-0.730	-0.243	-0.353	-0.4670	-0.1450	78.311	49.347
20.00	10.00	0.09	-0.6670	-0.752	-0.365	-0.309	-0.4720	-0.2550	71.107	53.077

RUDDER DYNAMOMETER
ep4qp1430.rud Quad IV 400 rpm -10m/s Rudder No. 2 X/D=0.39

Angle	V	RPM	Cl	Cn	Cd	Cmz	Cmx	Cmy	Cpc	Cps
-20.00	10.00	409.59	0.4550	0.511	-0.245	0.216	0.3260	-0.1990	72.211	55.720
-15.00	10.00	409.59	0.4570	0.478	-0.140	0.214	0.3430	-0.1230	74.752	58.496
-10.00	10.00	409.59	0.5410	0.537	-0.024	0.267	0.3560	-0.0340	79.761	48.809
-5.00	10.00	409.59	0.2520	0.249	0.022	0.142	0.1680	0.0080	86.896	49.336
0.00	10.00	409.59	0.0145	0.014	0.009	0.010	0.0230	0.0245	165.186	210.351
5.00	10.00	409.59	0.0070	0.010	0.032	-0.092	0.0080	0.0220	-884.499	81.815
10.00	10.00	409.59	-0.2440	-0.242	-0.008	-0.213	-0.1500	0.0000	118.112	43.645
15.00	10.00	409.59	-0.3840	-0.411	-0.153	-0.254	-0.2770	-0.0890	91.865	53.301
20.00	10.00	409.59	-0.4890	-0.557	-0.284	-0.254	-0.4070	-0.2070	75.656	63.806
25.00	10.00	409.59	-0.5420	-0.670	-0.425	-0.279	-0.3720	-0.2930	71.552	51.247
30.00	10.00	409.59	-0.5990	-0.808	-0.579	-0.322	-0.4140	-0.4010	69.877	51.680
35.00	10.00	409.59	-0.6320	-0.937	-0.732	-0.356	-0.4260	-0.5140	67.949	51.191

RUDDER DYNAMOMETER
ep4qp15.rud Quad IV 806 rpm -10m/s Rudder No. 2 X/D=0.39

Angle	V	RPM	Cl	Cn	Cd	Cmz	Cmx	Cmy	Cpc	Cps
-30.00	10.00	805.76	0.5580	0.681	-0.395	0.280	0.3770	-0.3700	71.284	57.741
-25.00	10.00	807.22	0.4750	0.570	-0.330	0.227	0.3450	-0.2570	69.760	56.461
-20.00	10.00	805.76	0.3697	0.403	-0.162	0.185	0.2517	-0.1743	76.148	56.035
-15.00	10.00	807.22	0.3480	0.367	-0.117	0.172	0.2830	-0.0910	76.823	63.405
-10.00	10.00	805.76	0.2413	0.230	0.046	0.184	0.1753	0.0030	112.039	58.839
-5.00	10.00	807.22	0.0130	0.009	0.049	0.082	0.0150	0.0320	947.575	114.052
0.00	10.00	805.76	0.0070	0.007	0.068	0.002	0.0157	0.0527	100.507	22.637
5.00	10.00	807.22	0.0640	0.067	0.038	-0.070	0.0400	0.0320	-73.907	45.977
10.00	10.00	805.76	-0.1037	-0.085	0.096	-0.167	-0.0750	0.0070	296.596	87.361
15.00	10.00	807.22	-0.2790	-0.298	-0.107	-0.195	-0.1900	-0.0790	95.618	50.926
20.00	10.00	805.76	-0.3547	-0.386	-0.152	-0.203	-0.2760	-0.1753	83.334	66.485
25.00	10.00	807.22	-0.5270	-0.641	-0.387	-0.255	-0.3560	-0.2790	69.772	51.186
30.00	10.00	805.76	-0.5673	-0.710	-0.437	-0.299	-0.3827	-0.3797	72.165	56.282
35.00	10.00	807.22	-0.6240	-0.906	-0.689	-0.348	-0.4250	-0.5080	68.435	53.061

RUDDER DYNAMOMETER
ep4qp1630.rud Quad IV 1460 rpm -10m/s Rudder No. 2 X/D=0.39

Angle	V	RPM	Cl	Cn	Cd	Cmz	Cmx	Cmy	Cpc	Cps
-20.00	10.00	1455.58	0.1125	0.149	-0.127	0.013	-0.0335	-0.1070	90.855	137.611
-10.00	10.00	1455.58	0.1470	0.134	0.064	0.099	0.0860	-0.0090	104.176	46.899
0.00	10.00	1455.58	-0.0180	-0.018	0.037	-0.027	-0.0030	0.0280	179.022	-1.028
20.00	10.00	1455.58	-0.6760	-0.741	-0.311	-0.236	-0.4870	-0.2530	61.827	55.861

APPENDIX B PROPELLER FORCE DATA

PROPELLER DYNAMOMETER
ppfsv1.pro Open Water Four Quadrant Performance V=10m/s

P/D	V	RPM	Beta	J	Kt	Kq	n	Kt/J2	Kq/J2	Ct
0.95	10.00	2104.56	9.20	0.3564	0.284	0.045	0.359	2.2340	2.7925	0.146
0.95	10.00	1861.04	10.38	0.4030	0.258	0.043	0.387	1.5911	1.9888	0.132
0.95	10.00	1605.93	11.99	0.4670	0.203	0.039	0.385	0.9295	1.1619	0.102
0.95	10.00	1466.70	13.09	0.5114	0.167	0.037	0.368	0.6394	0.7993	0.083
0.95	10.00	1186.92	16.03	0.6319	0.165	0.031	0.532	0.4135	0.5169	0.080
0.95	10.00	972.13	19.33	0.7715	0.083	0.025	0.407	0.1398	0.1747	0.039
0.95	10.00	802.70	23.02	0.9344	0.020	0.013	0.230	0.0233	0.0291	0.009
0.95	10.00	601.47	29.55	1.2469	-0.156	-0.017	1.815	-0.1002	-0.1252	-0.062
0.95	10.00	402.36	40.28	1.8640	-0.712	-0.113	1.862	-0.2050	-0.2562	-0.218
0.95	10.00	204.27	59.08	3.6716	-3.407	-0.415	4.796	-0.2528	-0.3159	-0.474
0.95	10.00		90.00		-1.000	-1.000		-0.3343	-0.4179	-1.032
0.95	10.00	-206.63	121.21	3.6297	-4.113	-0.694	3.422	-0.3122	-0.3902	-0.582
0.95	10.00	-404.36	139.86	1.8548	-1.651	-0.304	1.605	-0.4799	-0.5998	-0.508
0.95	10.00	-604.78	150.58	1.2401	-0.881	-0.163	1.067	-0.5731	-0.7163	-0.352
0.95	10.00	-801.17	156.94	0.9361	-0.628	-0.106	0.881	-0.7163	-0.8954	-0.280
0.95	10.00	-1024.30	161.58	0.7322	-0.462	-0.077	0.697	-0.8619	-1.0774	-0.219
0.95	10.00	-1230.67	164.51	0.6094	-0.394	-0.063	0.611	-1.0611	-1.3264	-0.193
0.95	10.00	-1420.74	166.50	0.5279	-0.309	-0.055	0.476	-1.1100	-1.3875	-0.154
0.95	10.00	-1615.17	168.08	0.4643	-0.247	-0.048	0.385	-1.1473	-1.4341	-0.125
0.95	-10.00	1459.77	346.85	-0.5138	0.303	0.045	-0.549	1.1464	1.4330	0.151
0.95	-10.00	1180.04	343.88	-0.6356	0.373	0.054	-0.701	0.9227	1.1534	0.181
0.95	-10.00	972.93	340.68	-0.7709	0.463	0.061	-0.931	0.7799	0.9749	0.217
0.95	-10.00	807.24	337.10	-0.9291	0.527	0.072	-1.081	0.6101	0.7626	0.235
0.95	-10.00	601.50	330.45	-1.2469	0.786	0.106	-1.470	0.5059	0.6323	0.313
0.95	-10.00	400.54	319.59	-1.8725	1.511	0.210	-2.148	0.4309	0.5387	0.461
0.95	-10.00	202.47	300.70	-3.7043	3.422	0.501	-4.026	0.2494	0.3118	0.470
0.95	-10.00		270.00		-1.000	-1.000		-0.0246	-0.0307	-0.076
0.95	-10.00	-200.47	239.55	-3.7412	3.360	0.334	-5.989	0.2401	0.3001	0.454
0.95	-10.00	-408.39	219.87	-1.8365	0.691	0.081	-2.509	0.2049	0.2562	0.214
0.95	-10.00	-408.39	219.87	-1.8365	0.687	0.080	-2.517	0.2037	0.2547	0.213
0.95	-10.00	-601.33	209.56	-1.2472	0.175	0.014	-2.560	0.1124	0.1405	0.070
0.95	-10.00	-820.75	202.56	-0.9138	0.016	-0.012	-1.000	0.0187	0.0234	0.007
0.95	-10.00	-1012.72	198.61	-0.7406	-0.067	-0.020	-0.394	-0.1230	-0.1537	-0.032
0.95	-10.00	-1207.41	195.77	-0.6212	-0.099	-0.026	-0.374	-0.2576	-0.3220	-0.048
0.95	-10.00	-1469.51	193.07	-0.5104	-0.124	-0.031	-0.329	-0.4743	-0.5928	-0.062
0.95	-10.00	-1745.40	191.06	-0.4297	-0.140	-0.034	-0.282	-0.7565	-0.9456	-0.071
0.95	-10.00	-1745.40	191.06	-0.4297	-0.139	-0.034	-0.277	-0.7518	-0.9397	-0.070
0.95	-10.00	-2016.52	189.60	-0.3719	-0.179	-0.036	-0.293	-1.2916	-1.6145	-0.091

PROPELLER DYNAMOMETER
ppfsv2.pro Open Water Four Quadrant Performance V=20m/s

P/D	V	RPM	Beta	J	Kt	Kq	n	Kt/J2	Kq/J2	Ct
0.95	-20.00	801.36	319.60	-1.8718	1.730	0.241	-2.135	0.4939	0.6173	0.528
0.95	-20.00	609.27	311.77	-2.4620	2.545	0.366	-2.721	0.4198	0.5248	0.595

0.95	-20.00	406.05	300.77	-3.6941	3.883	0.588	-3.885	0.2845	0.3557	0.535
0.95	-20.00	204.52	286.69	-7.3344	11.134	1.647	-7.892	0.2070	0.2587	0.484
0.95	-20.00	-201.86	253.51	-7.4308	11.477	1.476	-9.199	0.2079	0.2598	0.487
0.95	-20.00	-400.78	239.56	-3.7427	3.416	0.523	-3.894	0.2439	0.3048	0.462
0.95	-20.00	-614.49	227.98	-2.4411	1.514	0.265	-2.223	0.2541	0.3176	0.357
0.95	-20.00	-818.10	219.82	-1.8335	0.776	0.125	-1.812	0.2310	0.2887	0.241
0.95	-20.00	-1007.55	214.10	-1.4888	0.412	0.064	-1.535	0.1859	0.2324	0.149
0.95	-20.00	-1217.68	209.26	-1.2319	0.244	0.030	-1.622	0.1610	0.2013	0.098
0.95	-20.00	-1458.34	205.07	-1.0286	0.102	0.009	-1.917	0.0966	0.1208	0.044
0.95	-20.00	-1616.09	202.88	-0.9282	0.036	0.001	-8.001	0.0422	0.0527	0.016
0.95	-20.00	-1813.20	200.62	-0.8273	0.023	-0.007	-1.000	0.0340	0.0424	0.011
0.95	-20.00	-2047.53	198.42	-0.7326	-0.038	-0.012	-0.361	-0.0717	-0.0897	-0.018
0.95	20.00	1463.90	24.98	1.0247	0.020	0.008	0.389	0.0192	0.0240	0.009
0.95	20.00	803.23	40.34	1.8675	-0.777	-0.105	2.195	-0.2228	-0.2785	-0.238
0.95	20.00	601.85	48.58	2.4923	-1.661	-0.234	2.812	-0.2674	-0.3343	-0.383
0.95	20.00	405.90	59.24	3.6955	-3.238	-0.413	4.613	-0.2371	-0.2964	-0.446
0.95	20.00	203.30	73.40	7.3784	-11.386	-1.345	9.943	-0.2091	-0.2614	-0.489
0.95	20.00	110.24	80.82	13.6072	-38.725	-4.679	17.924	-0.2091	-0.2614	-0.519
0.95	20.00	110.24	80.82	13.6072	-38.887	-4.660	18.073	-0.2100	-0.2625	-0.521
0.95	20.00	-161.40	103.31	9.2939	-19.500	-2.763	10.439	-0.2258	-0.2822	-0.544
0.95	20.00	-309.14	114.38	4.8521	-6.220	-0.934	5.141	-0.2642	-0.3302	-0.558
0.95	20.00	-429.20	122.18	3.4949	-3.871	-0.604	3.564	-0.3169	-0.3962	-0.578
0.95	20.00	-605.29	131.59	2.4782	-2.603	-0.419	2.449	-0.4238	-0.5298	-0.604
0.95	20.00	-810.27	139.91	1.8512	-1.693	-0.284	1.755	-0.4940	-0.6175	-0.522

PROPELLER DYNAMOMETER
epflj7.pro 800 rpm 0 m/s X/D=0.39

Angle	V	RPM	Beta	J	Kt	Kq	n	Kt/J2	Kq/J2	Ct
-70.00	0.00	804.26	0.00	0.0000	0.318	0.054	0.000	-1.0000	-1.0000	0.168
-65.00	0.00	804.26	0.00	0.0000	0.311	0.054	0.000	-1.0000	-1.0000	0.164
-60.00	0.00	804.26	0.00	0.0000	0.346	0.054	0.000	-1.0000	-1.0000	0.182
-55.00	0.00	804.26	0.00	0.0000	0.335	0.054	0.000	-1.0000	-1.0000	0.177
-50.00	0.00	804.26	0.00	0.0000	0.320	0.054	0.000	-1.0000	-1.0000	0.169
-45.00	0.00	804.26	0.00	0.0000	0.318	0.054	0.000	-1.0000	-1.0000	0.168
-40.00	0.00	804.26	0.00	0.0000	0.315	0.054	0.000	-1.0000	-1.0000	0.166
-35.00	0.00	804.26	0.00	0.0000	0.304	0.055	0.000	-1.0000	-1.0000	0.160
-30.00	0.00	804.26	0.00	0.0000	0.300	0.055	0.000	-1.0000	-1.0000	0.158
-25.00	0.00	804.26	0.00	0.0000	0.308	0.054	0.000	-1.0000	-1.0000	0.162
-20.00	0.00	804.26	0.00	0.0000	0.342	0.054	0.000	-1.0000	-1.0000	0.180
-15.00	0.00	804.26	0.00	0.0000	0.333	0.055	0.000	-1.0000	-1.0000	0.176
-10.00	0.00	804.26	0.00	0.0000	0.297	0.054	0.000	-1.0000	-1.0000	0.157
-5.00	0.00	804.26	0.00	0.0000	0.274	0.054	0.000	-1.0000	-1.0000	0.145
0.00	0.00	804.26	0.00	0.0000	0.304	0.054	0.000	-1.0000	-1.0000	0.160
5.00	0.00	804.26	0.00	0.0000	0.333	0.054	0.000	-1.0000	-1.0000	0.176
10.00	0.00	804.26	0.00	0.0000	0.326	0.054	0.000	-1.0000	-1.0000	0.172
15.00	0.00	804.26	0.00	0.0000	0.305	0.054	0.000	-1.0000	-1.0000	0.161
20.00	0.00	804.26	0.00	0.0000	0.301	0.055	0.000	-1.0000	-1.0000	0.159
25.00	0.00	804.26	0.00	0.0000	0.293	0.054	0.000	-1.0000	-1.0000	0.155
30.00	0.00	804.26	0.00	0.0000	0.316	0.054	0.000	-1.0000	-1.0000	0.167
35.00	0.00	804.26	0.00	0.0000	0.333	0.054	0.000	-1.0000	-1.0000	0.176
40.00	0.00	804.26	0.00	0.0000	0.340	0.054	0.000	-1.0000	-1.0000	0.179
45.00	0.00	804.26	0.00	0.0000	0.308	0.055	0.000	-1.0000	-1.0000	0.162

50.00	0.00	804.26	0.00	0.0000	0.299	0.055	0.000	-1.0000	-1.0000	0.158
55.00	0.00	804.26	0.00	0.0000	0.322	0.055	0.000	-1.0000	-1.0000	0.170
60.00	0.00	804.26	0.00	0.0000	0.329	0.054	0.000	-1.0000	-1.0000	0.173
65.00	0.00	804.26	0.00	0.0000	0.345	0.054	0.000	-1.0000	-1.0000	0.182
70.00	0.00	804.26	0.00	0.0000	0.313	0.053	0.000	-1.0000	-1.0000	0.165

PROPELLER DYNAMOMETER
epflj8.pro 1460 rpm 0 m/s X/D=0.39

Angle	V	RPM	Beta	J	Kt	Kq	n	Kt/J2	Kq/J2	Ct
-70.00	0.00	1459.62	0.00	0.0000	0.377	0.054	0.000	-1.0000	-1.0000	0.199
-60.00	0.00	1459.62	0.00	0.0000	0.344	0.054	0.000	-1.0000	-1.0000	0.181
-50.00	0.00	1459.62	0.00	0.0000	0.357	0.054	0.000	-1.0000	-1.0000	0.188
-40.00	0.00	1459.62	0.00	0.0000	0.387	0.054	0.000	-1.0000	-1.0000	0.204
-30.00	0.00	1459.62	0.00	0.0000	0.369	0.055	0.000	-1.0000	-1.0000	0.194
-20.00	0.00	1459.62	0.00	0.0000	0.334	0.054	0.000	-1.0000	-1.0000	0.176
-10.00	0.00	1459.62	0.00	0.0000	0.370	0.054	0.000	-1.0000	-1.0000	0.195
-5.00	0.00	1459.62	0.00	0.0000	0.379	0.054	0.000	-1.0000	-1.0000	0.200
0.00	0.00	1460.09	0.00	0.0000	0.360	0.054	0.000	-1.0000	-1.0000	0.189
5.00	0.00	1459.62	0.00	0.0000	0.334	0.053	0.000	-1.0000	-1.0000	0.176
10.00	0.00	1459.62	0.00	0.0000	0.340	0.054	0.000	-1.0000	-1.0000	0.179
20.00	0.00	1459.62	0.00	0.0000	0.386	0.055	0.000	-1.0000	-1.0000	0.203
25.00	0.00	1459.62	0.00	0.0000	0.390	0.055	0.000	-1.0000	-1.0000	0.206
30.00	0.00	1459.62	0.00	0.0000	0.340	0.054	0.000	-1.0000	-1.0000	0.179
40.00	0.00	1459.62	0.00	0.0000	0.347	0.054	0.000	-1.0000	-1.0000	0.183
50.00	0.00	1459.62	0.00	0.0000	0.386	0.054	0.000	-1.0000	-1.0000	0.203
60.00	0.00	1459.62	0.00	0.0000	0.393	0.054	0.000	-1.0000	-1.0000	0.207
70.00	0.00	1459.62	0.00	0.0000	0.368	0.053	0.000	-1.0000	-1.0000	0.194

PROPELLER DYNAMOMETER
epflaj13.pro 800 rpm 10m/s Rudder No. 2 X/D=0.39

Angle	V	RPM	Beta	J	Kt	Kq	n	Kt/J2	Kq/J2	Ct
-30.00	10.00	806.67	22.92	0.9298	0.119	0.026	0.681	0.1376	0.1720	0.053
-25.00	10.00	806.67	22.92	0.9298	0.121	0.025	0.707	0.1399	0.1749	0.054
-20.00	10.00	806.67	22.92	0.9298	0.107	0.025	0.643	0.1235	0.1543	0.048
-15.00	10.00	806.67	22.92	0.9298	0.065	0.024	0.407	0.0753	0.0941	0.029
-10.00	10.00	806.67	22.92	0.9298	0.050	0.022	0.334	0.0576	0.0720	0.022
-5.00	10.00	806.67	22.92	0.9298	0.047	0.022	0.311	0.0541	0.0676	0.021
0.00	10.00	806.67	22.92	0.9298	0.066	0.022	0.436	0.0764	0.0955	0.030
5.00	10.00	806.67	22.92	0.9298	0.087	0.023	0.551	0.1011	0.1264	0.039
10.00	10.00	806.67	22.92	0.9298	0.094	0.024	0.580	0.1082	0.1352	0.042
15.00	10.00	806.67	22.92	0.9298	0.020	0.022	0.139	0.0235	0.0294	0.009
20.00	10.00	806.67	22.92	0.9298	0.070	0.024	0.429	0.0811	0.1014	0.031
25.00	10.00	806.67	22.92	0.9298	0.087	0.023	0.551	0.1011	0.1264	0.039
30.00	10.00	806.67	22.92	0.9298	0.132	0.024	0.814	0.1529	0.1911	0.059

PROPELLER DYNAMOMETER
epflaj2.pro 1460 rpm 10m/s Rudder No. 2 X/D=0.39

Angle	V	RPM	Beta	J	Kt	Kq	n	Kt/J2	Kq/J2	Ct
-70.00	10.00	1458.69	13.16	0.5142	0.280	0.043	0.535	1.0588	1.3234	0.140
-60.00	10.00	1458.69	13.16	0.5142	0.278	0.043	0.535	1.0508	1.3135	0.139
-50.00	10.00	1458.69	13.16	0.5142	0.247	0.043	0.475	0.9359	1.1699	0.124
-40.00	10.00	1461.73	13.13	0.5131	0.255	0.044	0.471	0.9699	1.2123	0.127
-35.00	10.00	1464.77	13.11	0.5120	0.283	0.045	0.514	1.0807	1.3509	0.141
-30.00	10.00	1461.73	13.13	0.5131	0.249	0.043	0.474	0.9444	1.1804	0.124
-25.00	10.00	1464.77	13.11	0.5120	0.263	0.044	0.491	1.0031	1.2538	0.131
-20.00	10.00	1461.73	13.13	0.5131	0.256	0.042	0.495	0.9721	1.2151	0.128
-15.00	10.00	1464.77	13.11	0.5120	0.227	0.043	0.429	0.8643	1.0804	0.113
-10.00	10.00	1461.73	13.13	0.5131	0.239	0.042	0.466	0.9097	1.1371	0.120
-7.50	10.00	1458.69	13.16	0.5142	0.253	0.041	0.509	0.9576	1.1969	0.126
-5.00	10.00	1461.73	13.13	0.5131	0.223	0.042	0.435	0.8467	1.0584	0.111
-4.00	10.00	1458.69	13.16	0.5142	0.236	0.041	0.470	0.8927	1.1159	0.118
-3.00	10.00	1458.69	13.16	0.5142	0.242	0.041	0.481	0.9155	1.1443	0.121
-2.00	10.00	1458.69	13.16	0.5142	0.200	0.041	0.399	0.7574	0.9467	0.100
-1.00	10.00	1458.69	13.16	0.5142	0.252	0.041	0.502	0.9541	1.1927	0.126
0.00	10.00	1460.72	13.14	0.5135	0.239	0.041	0.473	0.9085	1.1356	0.120
1.00	10.00	1458.69	13.16	0.5142	0.200	0.041	0.401	0.7574	0.9467	0.100
2.00	10.00	1458.69	13.16	0.5142	0.257	0.041	0.515	0.9712	1.2140	0.128
3.00	10.00	1458.69	13.16	0.5142	0.198	0.041	0.398	0.7506	0.9382	0.099
4.00	10.00	1458.69	13.16	0.5142	0.255	0.041	0.513	0.9632	1.2040	0.127
5.00	10.00	1461.73	13.13	0.5131	0.233	0.042	0.457	0.8852	1.1065	0.116
7.50	10.00	1458.69	13.16	0.5142	0.232	0.041	0.467	0.8791	1.0989	0.116
10.00	10.00	1461.73	13.13	0.5131	0.257	0.042	0.505	0.9773	1.2216	0.129
15.00	10.00	1464.77	13.11	0.5120	0.213	0.042	0.410	0.8114	1.0143	0.106
20.00	10.00	1461.73	13.13	0.5131	0.231	0.042	0.453	0.8794	1.0992	0.116
25.00	10.00	1464.77	13.11	0.5120	0.226	0.043	0.431	0.8632	1.0789	0.113
30.00	10.00	1461.73	13.13	0.5131	0.263	0.042	0.510	1.0001	1.2501	0.131
35.00	10.00	1461.73	13.13	0.5131	0.228	0.042	0.441	0.8657	1.0821	0.114
40.00	10.00	1461.73	13.13	0.5131	0.242	0.043	0.463	0.9180	1.1475	0.121
45.00	10.00	1458.69	13.16	0.5142	0.275	0.042	0.535	1.0417	1.3021	0.138
50.00	10.00	1461.73	13.13	0.5131	0.232	0.043	0.436	0.8798	1.0997	0.116
55.00	10.00	1458.69	13.16	0.5142	0.260	0.043	0.498	0.9848	1.2311	0.130
60.00	10.00	1461.73	13.13	0.5131	0.286	0.044	0.530	1.0867	1.3583	0.143
65.00	10.00	1458.69	13.16	0.5142	0.249	0.043	0.470	0.9416	1.1770	0.124
70.00	10.00	1461.73	13.13	0.5131	0.283	0.044	0.525	1.0758	1.3447	0.141

PROPELLER DYNAMOMETER
epflaj3.pro 2100 rpm 10m/s Rudder No. 2 X/D=0.39

Angle	V	RPM	Beta	J	Kt	Kq	n	Kt/J2	Kq/J2	Ct
-70.00	10.00	2103.66	9.21	0.3565	0.361	0.048	0.427	2.8420	3.5525	0.185
-60.00	10.00	2103.66	9.21	0.3565	0.361	0.048	0.429	2.8386	3.5482	0.185
-50.00	10.00	2103.66	9.21	0.3565	0.358	0.047	0.431	2.8191	3.5239	0.184
-40.00	10.00	2103.78	9.21	0.3565	0.362	0.048	0.427	2.8517	3.5646	0.186
-35.00	10.00	2103.90	9.21	0.3565	0.370	0.050	0.421	2.9105	3.6381	0.190
-30.00	10.00	2103.78	9.21	0.3565	0.363	0.049	0.421	2.8568	3.5710	0.186
-25.00	10.00	2103.90	9.21	0.3565	0.365	0.050	0.417	2.8740	3.5925	0.187

-20.00	10.00	2103.78	9.21	0.3565	0.359	0.049	0.420	2.8268	3.5334	0.184
-15.00	10.00	2103.90	9.21	0.3565	0.354	0.049	0.407	2.7870	3.4837	0.182
-10.00	10.00	2103.78	9.21	0.3565	0.352	0.048	0.414	2.7706	3.4633	0.181
-7.50	10.00	2103.66	9.21	0.3565	0.354	0.047	0.425	2.7848	3.4810	0.182
-5.00	10.00	2103.78	9.21	0.3565	0.351	0.049	0.410	2.7612	3.4515	0.180
-4.00	10.00	2103.66	9.21	0.3565	0.347	0.048	0.410	2.7300	3.4125	0.178
-3.00	10.00	2103.66	9.21	0.3565	0.345	0.048	0.408	2.7163	3.3953	0.177
-2.00	10.00	2103.66	9.21	0.3565	0.347	0.048	0.410	2.7288	3.4110	0.178
-1.00	10.00	2103.66	9.21	0.3565	0.345	0.048	0.407	2.7117	3.3896	0.177
0.00	10.00	2103.76	9.21	0.3565	0.353	0.048	0.416	2.7796	3.4745	0.181
1.00	10.00	2103.66	9.21	0.3565	0.348	0.048	0.413	2.7380	3.4225	0.179
2.00	10.00	2103.66	9.21	0.3565	0.348	0.048	0.413	2.7357	3.4196	0.178
3.00	10.00	2103.66	9.21	0.3565	0.350	0.048	0.416	2.7551	3.4439	0.180
4.00	10.00	2103.66	9.21	0.3565	0.350	0.048	0.417	2.7563	3.4453	0.180
5.00	10.00	2103.78	9.21	0.3565	0.356	0.048	0.418	2.8014	3.5018	0.183
7.50	10.00	2103.66	9.21	0.3565	0.350	0.048	0.418	2.7528	3.4410	0.179
10.00	10.00	2103.78	9.21	0.3565	0.356	0.048	0.418	2.7991	3.4989	0.183
15.00	10.00	2103.90	9.21	0.3565	0.364	0.049	0.421	2.8646	3.5808	0.187
20.00	10.00	2103.78	9.21	0.3565	0.360	0.048	0.422	2.8363	3.5454	0.185
25.00	10.00	2103.90	9.21	0.3565	0.369	0.050	0.423	2.9022	3.6278	0.189
30.00	10.00	2103.78	9.21	0.3565	0.363	0.049	0.422	2.8527	3.5659	0.186
35.00	10.00	2103.90	9.21	0.3565	0.367	0.049	0.423	2.8905	3.6131	0.188
40.00	10.00	2103.78	9.21	0.3565	0.366	0.049	0.426	2.8829	3.6037	0.188
50.00	10.00	2103.66	9.21	0.3565	0.364	0.048	0.429	2.8649	3.5811	0.187
60.00	10.00	2103.66	9.21	0.3565	0.358	0.048	0.427	2.8203	3.5253	0.184
70.00	10.00	2103.66	9.21	0.3565	0.357	0.047	0.433	2.8111	3.5139	0.183

PROPELLER DYNAMOMETER
epzj1x22.pro 750 rpm 0m/s Rudder No. 2 X/D=0.39

Angle	V	RPM	Beta	J	Kt	Kq	n	Kt/J2	Kq/J2	Ct
-60.00	0.00	755.50	0.00	0.0000	0.421	0.057	0.000	-1.0000	-1.0000	0.222
-55.00	0.00	755.50	0.00	0.0000	0.396	0.056	0.000	-1.0000	-1.0000	0.208
-50.00	0.00	755.50	0.00	0.0000	0.411	0.057	0.000	-1.0000	-1.0000	0.216
-45.00	0.00	755.50	0.00	0.0000	0.421	0.058	0.000	-1.0000	-1.0000	0.222
-40.00	0.00	755.50	0.00	0.0000	0.435	0.059	0.000	-1.0000	-1.0000	0.229
-35.00	0.00	755.50	0.00	0.0000	0.426	0.058	0.000	-1.0000	-1.0000	0.224
-30.00	0.00	755.50	0.00	0.0000	0.423	0.059	0.000	-1.0000	-1.0000	0.223
-25.00	0.00	755.50	0.00	0.0000	0.419	0.059	0.000	-1.0000	-1.0000	0.220
-20.00	0.00	755.50	0.00	0.0000	0.417	0.058	0.000	-1.0000	-1.0000	0.219
-15.00	0.00	755.50	0.00	0.0000	0.422	0.059	0.000	-1.0000	-1.0000	0.222
-10.00	0.00	755.50	0.00	0.0000	0.390	0.058	0.000	-1.0000	-1.0000	0.205
-5.00	0.00	755.50	0.00	0.0000	0.388	0.057	0.000	-1.0000	-1.0000	0.204
0.00	0.00	755.50	0.00	0.0000	0.403	0.057	0.000	-1.0000	-1.0000	0.212
5.00	0.00	755.50	0.00	0.0000	0.405	0.059	0.000	-1.0000	-1.0000	0.213
10.00	0.00	755.50	0.00	0.0000	0.404	0.059	0.000	-1.0000	-1.0000	0.213
15.00	0.00	755.50	0.00	0.0000	0.390	0.058	0.000	-1.0000	-1.0000	0.205
20.00	0.00	755.50	0.00	0.0000	0.405	0.059	0.000	-1.0000	-1.0000	0.213
25.00	0.00	755.50	0.00	0.0000	0.406	0.059	0.000	-1.0000	-1.0000	0.214
30.00	0.00	755.50	0.00	0.0000	0.398	0.058	0.000	-1.0000	-1.0000	0.210
35.00	0.00	755.50	0.00	0.0000	0.406	0.058	0.000	-1.0000	-1.0000	0.214
40.00	0.00	755.50	0.00	0.0000	0.399	0.057	0.000	-1.0000	-1.0000	0.210
45.00	0.00	755.50	0.00	0.0000	0.384	0.057	0.000	-1.0000	-1.0000	0.202

50.00	0.00	755.50	0.00	0.0000	0.374	0.056	0.000	-1.0000	-1.0000	0.197
55.00	0.00	755.50	0.00	0.0000	0.377	0.056	0.000	-1.0000	-1.0000	0.199
60.00	0.00	755.50	0.00	0.0000	0.385	0.055	0.000	-1.0000	-1.0000	0.203
65.00	0.00	755.50	0.00	0.0000	0.384	0.054	0.000	-1.0000	-1.0000	0.202
70.00	0.00	755.50	0.00	0.0000	0.368	0.055	0.000	-1.0000	-1.0000	0.194

PROPELLER DYNAMOMETER
epzj2x23.pro 1166 rpm 0m/s Rudder No. 2 X/D=0.39

Angle	V	RPM	Beta	J	Kt	Kq	n	Kt/J2	Kq/J2	Ct
-30.00	0.00	1166.72	0.00	0.0000	0.427	0.059	0.000	-1.0000	-1.0000	0.225
-25.00	0.00	1166.72	0.00	0.0000	0.418	0.059	0.000	-1.0000	-1.0000	0.220
-20.00	0.00	1166.72	0.00	0.0000	0.419	0.058	0.000	-1.0000	-1.0000	0.220
-15.00	0.00	1166.72	0.00	0.0000	0.414	0.058	0.000	-1.0000	-1.0000	0.218
-10.00	0.00	1166.72	0.00	0.0000	0.414	0.058	0.000	-1.0000	-1.0000	0.218
-5.00	0.00	1166.72	0.00	0.0000	0.418	0.058	0.000	-1.0000	-1.0000	0.220
0.00	0.00	1166.72	0.00	0.0000	0.410	0.058	0.000	-1.0000	-1.0000	0.216
5.00	0.00	1166.72	0.00	0.0000	0.415	0.058	0.000	-1.0000	-1.0000	0.219
10.00	0.00	1166.72	0.00	0.0000	0.413	0.058	0.000	-1.0000	-1.0000	0.218
15.00	0.00	1166.72	0.00	0.0000	0.420	0.059	0.000	-1.0000	-1.0000	0.221
20.00	0.00	1166.72	0.00	0.0000	0.424	0.058	0.000	-1.0000	-1.0000	0.223
25.00	0.00	1166.72	0.00	0.0000	0.419	0.058	0.000	-1.0000	-1.0000	0.221
30.00	0.00	1166.72	0.00	0.0000	0.422	0.058	0.000	-1.0000	-1.0000	0.222
35.00	0.00	1166.72	0.00	0.0000	0.420	0.057	0.000	-1.0000	-1.0000	0.221

PROPELLER DYNAMOMETER
epzj2x24.pro 1166 rpm 0m/s Rudder No. 3 X/D=0.39

Angle	V	RPM	Beta	J	Kt	Kq	n	Kt/J2	Kq/J2	Ct
-30.00	0.00	1168.65	0.00	0.0000	0.428	0.060	0.000	-1.0000	-1.0000	0.225
-25.00	0.00	1168.65	0.00	0.0000	0.426	0.059	0.000	-1.0000	-1.0000	0.225
-20.00	0.00	1168.65	0.00	0.0000	0.437	0.060	0.000	-1.0000	-1.0000	0.230
-15.00	0.00	1168.65	0.00	0.0000	0.428	0.058	0.000	-1.0000	-1.0000	0.226
-10.00	0.00	1168.65	0.00	0.0000	0.419	0.059	0.000	-1.0000	-1.0000	0.221
-5.00	0.00	1168.65	0.00	0.0000	0.422	0.057	0.000	-1.0000	-1.0000	0.222
0.00	0.00	1168.65	0.00	0.0000	0.415	0.058	0.000	-1.0000	-1.0000	0.218
5.00	0.00	1168.65	0.00	0.0000	0.428	0.058	0.000	-1.0000	-1.0000	0.225
10.00	0.00	1168.65	0.00	0.0000	0.430	0.059	0.000	-1.0000	-1.0000	0.227
15.00	0.00	1168.65	0.00	0.0000	0.416	0.059	0.000	-1.0000	-1.0000	0.219
20.00	0.00	1168.65	0.00	0.0000	0.431	0.058	0.000	-1.0000	-1.0000	0.227
25.00	0.00	1168.65	0.00	0.0000	0.424	0.060	0.000	-1.0000	-1.0000	0.224
30.00	0.00	1168.65	0.00	0.0000	0.426	0.058	0.000	-1.0000	-1.0000	0.225
35.00	0.00	1168.65	0.00	0.0000	0.418	0.058	0.000	-1.0000	-1.0000	0.220
40.00	0.00	1168.65	0.00	0.0000	0.422	0.058	0.000	-1.0000	-1.0000	0.222

PROPELLER DYNAMOMETER
epzj3x25.pro 1460 rpm 0m/s Rudder No. 2 X/D=0.39

Angle	V	RPM	Beta	J	Kt	Kq	n	Kt/J2	Kq/J2	Ct
-30.00	0.00	1455.91	0.00	0.0000	0.415	0.059	0.000	-1.0000	-1.0000	0.219
-25.00	0.00	1455.91	0.00	0.0000	0.414	0.059	0.000	-1.0000	-1.0000	0.218

-20.00	0.00	1455.91	0.00	0.0000	0.398	0.058	0.000	-1.0000	-1.0000	0.209
-15.00	0.00	1455.91	0.00	0.0000	0.380	0.058	0.000	-1.0000	-1.0000	0.200
-10.00	0.00	1455.91	0.00	0.0000	0.402	0.059	0.000	-1.0000	-1.0000	0.212
-5.00	0.00	1455.91	0.00	0.0000	0.398	0.058	0.000	-1.0000	-1.0000	0.210
0.00	0.00	1455.91	0.00	0.0000	0.390	0.058	0.000	-1.0000	-1.0000	0.206
5.00	0.00	1455.91	0.00	0.0000	0.398	0.058	0.000	-1.0000	-1.0000	0.210
10.00	0.00	1455.91	0.00	0.0000	0.407	0.059	0.000	-1.0000	-1.0000	0.214
15.00	0.00	1455.91	0.00	0.0000	0.408	0.058	0.000	-1.0000	-1.0000	0.215
20.00	0.00	1455.91	0.00	0.0000	0.400	0.058	0.000	-1.0000	-1.0000	0.211
25.00	0.00	1455.91	0.00	0.0000	0.391	0.059	0.000	-1.0000	-1.0000	0.206
30.00	0.00	1455.91	0.00	0.0000	0.404	0.058	0.000	-1.0000	-1.0000	0.213
35.00	0.00	1455.91	0.00	0.0000	0.410	0.058	0.000	-1.0000	-1.0000	0.216
40.00	0.00	1455.91	0.00	0.0000	0.407	0.058	0.000	-1.0000	-1.0000	0.214

PROPELLER DYNAMOMETER
epzj1x16.pro 750 rpm 0m/s Rudder No. 2 X/D=0.30

Angle	V	RPM	Beta	J	Kt	Kq	n	Kt/J2	Kq/J2	Ct
-30.00	0.00	755.52	0.00	0.0000	0.395	0.059	0.000	-1.0000	-1.0000	0.208
-25.00	0.00	755.52	0.00	0.0000	0.413	0.059	0.000	-1.0000	-1.0000	0.217
-20.00	0.00	755.52	0.00	0.0000	0.419	0.059	0.000	-1.0000	-1.0000	0.221
-15.00	0.00	755.52	0.00	0.0000	0.393	0.059	0.000	-1.0000	-1.0000	0.207
-10.00	0.00	755.52	0.00	0.0000	0.382	0.059	0.000	-1.0000	-1.0000	0.201
-5.00	0.00	755.52	0.00	0.0000	0.396	0.059	0.000	-1.0000	-1.0000	0.209
0.00	0.00	755.52	0.00	0.0000	0.400	0.059	0.000	-1.0000	-1.0000	0.211
5.00	0.00	755.52	0.00	0.0000	0.416	0.058	0.000	-1.0000	-1.0000	0.219
10.00	0.00	755.52	0.00	0.0000	0.403	0.060	0.000	-1.0000	-1.0000	0.212
15.00	0.00	755.52	0.00	0.0000	0.403	0.059	0.000	-1.0000	-1.0000	0.212
20.00	0.00	755.52	0.00	0.0000	0.414	0.059	0.000	-1.0000	-1.0000	0.218
25.00	0.00	755.52	0.00	0.0000	0.424	0.060	0.000	-1.0000	-1.0000	0.223
30.00	0.00	755.52	0.00	0.0000	0.402	0.060	0.000	-1.0000	-1.0000	0.212
35.00	0.00	755.52	0.00	0.0000	0.413	0.060	0.000	-1.0000	-1.0000	0.217
40.00	0.00	755.52	0.00	0.0000	0.410	0.058	0.000	-1.0000	-1.0000	0.216

PROPELLER DYNAMOMETER
epzj3x17.pro 1460 rpm 0m/s Rudder No. 2 X/D=0.30

Angle	V	RPM	Beta	J	Kt	Kq	n	Kt/J2	Kq/J2	Ct
-30.00	0.00	1457.59	0.00	0.0000	0.421	0.061	0.000	-1.0000	-1.0000	0.222
-25.00	0.00	1457.59	0.00	0.0000	0.423	0.061	0.000	-1.0000	-1.0000	0.223
-20.00	0.00	1457.59	0.00	0.0000	0.416	0.060	0.000	-1.0000	-1.0000	0.219
-15.00	0.00	1457.59	0.00	0.0000	0.406	0.059	0.000	-1.0000	-1.0000	0.214
-10.00	0.00	1457.59	0.00	0.0000	0.407	0.059	0.000	-1.0000	-1.0000	0.214
-5.00	0.00	1457.59	0.00	0.0000	0.412	0.060	0.000	-1.0000	-1.0000	0.217
0.00	0.00	1457.59	0.00	0.0000	0.410	0.060	0.000	-1.0000	-1.0000	0.216
5.00	0.00	1457.59	0.00	0.0000	0.412	0.059	0.000	-1.0000	-1.0000	0.217
10.00	0.00	1457.59	0.00	0.0000	0.412	0.059	0.000	-1.0000	-1.0000	0.217
15.00	0.00	1457.59	0.00	0.0000	0.409	0.059	0.000	-1.0000	-1.0000	0.215
20.00	0.00	1457.59	0.00	0.0000	0.397	0.059	0.000	-1.0000	-1.0000	0.209
25.00	0.00	1457.59	0.00	0.0000	0.411	0.060	0.000	-1.0000	-1.0000	0.216
30.00	0.00	1457.59	0.00	0.0000	0.412	0.059	0.000	-1.0000	-1.0000	0.217
35.00	0.00	1457.59	0.00	0.0000	0.412	0.059	0.000	-1.0000	-1.0000	0.217

40.00	0.00	1457.59	0.00	0.0000	0.409	0.058	0.000	-1.0000	-1.0000	0.216

PROPELLER DYNAMOMETER
epzj1x39.pro 750 rpm 0m/s Rudder No. 2 X/D=0.52

Angle	V	RPM	Beta	J	Kt	Kq	n	Kt/J2	Kq/J2	Ct
-30.00	0.00	753.53	0.00	0.0000	0.375	0.060	0.000	-1.0000	-1.0000	0.198
-25.00	0.00	753.53	0.00	0.0000	0.392	0.061	0.000	-1.0000	-1.0000	0.206
-20.00	0.00	753.53	0.00	0.0000	0.377	0.060	0.000	-1.0000	-1.0000	0.198
-15.00	0.00	753.53	0.00	0.0000	0.387	0.061	0.000	-1.0000	-1.0000	0.204
-10.00	0.00	753.53	0.00	0.0000	0.386	0.062	0.000	-1.0000	-1.0000	0.203
-5.00	0.00	753.53	0.00	0.0000	0.370	0.062	0.000	-1.0000	-1.0000	0.195
0.00	0.00	753.53	0.00	0.0000	0.381	0.061	0.000	-1.0000	-1.0000	0.201
5.00	0.00	753.53	0.00	0.0000	0.397	0.060	0.000	-1.0000	-1.0000	0.209
10.00	0.00	753.53	0.00	0.0000	0.390	0.061	0.000	-1.0000	-1.0000	0.206
15.00	0.00	753.53	0.00	0.0000	0.372	0.060	0.000	-1.0000	-1.0000	0.196
20.00	0.00	753.53	0.00	0.0000	0.380	0.060	0.000	-1.0000	-1.0000	0.200
25.00	0.00	753.53	0.00	0.0000	0.396	0.060	0.000	-1.0000	-1.0000	0.209
30.00	0.00	753.53	0.00	0.0000	0.374	0.060	0.000	-1.0000	-1.0000	0.197
35.00	0.00	753.53	0.00	0.0000	0.377	0.060	0.000	-1.0000	-1.0000	0.198
40.00	0.00	753.53	0.00	0.0000	0.382	0.060	0.000	-1.0000	-1.0000	0.201

PROPELLER DYNAMOMETER
epzj3x39.pro 1460 rpm 0m/s Rudder No. 2 X/D=0.52

Angle	V	RPM	Beta	J	Kt	Kq	n	Kt/J2	Kq/J2	Ct
-30.00	0.00	1461.45	0.00	0.0000	0.413	0.059	0.000	-1.0000	-1.0000	0.217
-25.00	0.00	1461.45	0.00	0.0000	0.416	0.059	0.000	-1.0000	-1.0000	0.219
-20.00	0.00	1461.45	0.00	0.0000	0.395	0.058	0.000	-1.0000	-1.0000	0.208
-15.00	0.00	1461.45	0.00	0.0000	0.403	0.058	0.000	-1.0000	-1.0000	0.212
-10.00	0.00	1461.45	0.00	0.0000	0.407	0.058	0.000	-1.0000	-1.0000	0.214
-5.00	0.00	1461.45	0.00	0.0000	0.407	0.059	0.000	-1.0000	-1.0000	0.214
0.00	0.00	1461.45	0.00	0.0000	0.405	0.058	0.000	-1.0000	-1.0000	0.214
5.00	0.00	1461.45	0.00	0.0000	0.417	0.059	0.000	-1.0000	-1.0000	0.219
10.00	0.00	1461.45	0.00	0.0000	0.416	0.059	0.000	-1.0000	-1.0000	0.219
15.00	0.00	1461.45	0.00	0.0000	0.410	0.058	0.000	-1.0000	-1.0000	0.216
20.00	0.00	1461.45	0.00	0.0000	0.413	0.058	0.000	-1.0000	-1.0000	0.218
25.00	0.00	1461.45	0.00	0.0000	0.420	0.059	0.000	-1.0000	-1.0000	0.221
30.00	0.00	1461.45	0.00	0.0000	0.411	0.058	0.000	-1.0000	-1.0000	0.216
35.00	0.00	1461.45	0.00	0.0000	0.411	0.058	0.000	-1.0000	-1.0000	0.217
40.00	0.00	1461.45	0.00	0.0000	0.410	0.057	0.000	-1.0000	-1.0000	0.216

PROPELLER DYNAMOMETER
epzj3y210.pro 1460 rpm 0m/s Rudder No. 2 Y/D=0.25

Angle	V	RPM	Beta	J	Kt	Kq	n	Kt/J2	Kq/J2	Ct
-30.00	0.00	1455.82	0.00	0.0000	0.372	0.057	0.000	-1.0000	-1.0000	0.196
-25.00	0.00	1455.82	0.00	0.0000	0.378	0.057	0.000	-1.0000	-1.0000	0.199
-20.00	0.00	1455.82	0.00	0.0000	0.394	0.058	0.000	-1.0000	-1.0000	0.207
-15.00	0.00	1455.82	0.00	0.0000	0.390	0.058	0.000	-1.0000	-1.0000	0.205
-10.00	0.00	1455.82	0.00	0.0000	0.389	0.059	0.000	-1.0000	-1.0000	0.205

-5.00	0.00	1455.82	0.00	0.0000	0.381	0.059	0.000	-1.0000	-1.0000	0.200
0.00	0.00	1455.82	0.00	0.0000	0.380	0.058	0.000	-1.0000	-1.0000	0.200
5.00	0.00	1455.82	0.00	0.0000	0.390	0.058	0.000	-1.0000	-1.0000	0.205
10.00	0.00	1455.82	0.00	0.0000	0.391	0.058	0.000	-1.0000	-1.0000	0.206
15.00	0.00	1455.82	0.00	0.0000	0.385	0.057	0.000	-1.0000	-1.0000	0.203
20.00	0.00	1455.82	0.00	0.0000	0.386	0.058	0.000	-1.0000	-1.0000	0.203
25.00	0.00	1455.82	0.00	0.0000	0.383	0.058	0.000	-1.0000	-1.0000	0.202
30.00	0.00	1455.82	0.00	0.0000	0.390	0.058	0.000	-1.0000	-1.0000	0.205
35.00	0.00	1455.82	0.00	0.0000	0.390	0.058	0.000	-1.0000	-1.0000	0.206
40.00	0.00	1455.82	0.00	0.0000	0.389	0.058	0.000	-1.0000	-1.0000	0.205

PROPELLER DYNAMOMETER
epzj3y111.pro 1460 rpm 0m/s Rudder No. 2 Y/D=0.125

Angle	V	RPM	Beta	J	Kt	Kq	n	Kt/J2	Kq/J2	Ct
-30.00	0.00	1458.44	0.00	0.0000	0.387	0.057	0.000	-1.0000	-1.0000	0.204
-25.00	0.00	1458.44	0.00	0.0000	0.386	0.056	0.000	-1.0000	-1.0000	0.203
-20.00	0.00	1458.44	0.00	0.0000	0.383	0.056	0.000	-1.0000	-1.0000	0.202
-15.00	0.00	1458.44	0.00	0.0000	0.396	0.057	0.000	-1.0000	-1.0000	0.209
-10.00	0.00	1458.44	0.00	0.0000	0.396	0.057	0.000	-1.0000	-1.0000	0.209
-5.00	0.00	1458.44	0.00	0.0000	0.388	0.057	0.000	-1.0000	-1.0000	0.204
0.00	0.00	1458.44	0.00	0.0000	0.381	0.057	0.000	-1.0000	-1.0000	0.201
5.00	0.00	1458.44	0.00	0.0000	0.375	0.057	0.000	-1.0000	-1.0000	0.197
10.00	0.00	1458.44	0.00	0.0000	0.390	0.057	0.000	-1.0000	-1.0000	0.205
15.00	0.00	1458.44	0.00	0.0000	0.398	0.057	0.000	-1.0000	-1.0000	0.209
20.00	0.00	1458.44	0.00	0.0000	0.394	0.057	0.000	-1.0000	-1.0000	0.207
25.00	0.00	1458.44	0.00	0.0000	0.390	0.056	0.000	-1.0000	-1.0000	0.205
30.00	0.00	1458.44	0.00	0.0000	0.385	0.056	0.000	-1.0000	-1.0000	0.203
35.00	0.00	1458.44	0.00	0.0000	0.375	0.056	0.000	-1.0000	-1.0000	0.197
40.00	0.00	1458.44	0.00	0.0000	0.366	0.055	0.000	-1.0000	-1.0000	0.193

PROPELLER DYNAMOMETER
ep4qp16.pro Quad I 804 rpm 10m/s Rudder No. 2 X/D=0.39

Angle	V	RPM	Beta	J	Kt	Kq	n	Kt/J2	Kq/J2	Ct
-30.00	10.00	804.67	22.97	0.9321	0.030	0.019	0.235	0.0346	0.0432	0.013
-25.00	10.00	804.67	22.97	0.9321	0.005	0.015	0.048	0.0058	0.0072	0.002
-20.00	10.00	804.67	22.97	0.9321	-0.005	0.014	-1.000	-0.0058	-0.0072	-0.002
-15.00	10.00	804.67	22.97	0.9321	-0.012	0.013	-1.000	-0.0138	-0.0173	-0.005
-10.00	10.00	804.67	22.97	0.9321	0.021	0.013	0.231	0.0242	0.0302	0.009
-5.00	10.00	804.67	22.97	0.9321	-0.003	0.013	-1.000	-0.0035	-0.0043	-0.001
0.00	10.00	804.67	22.97	0.9321	-0.013	0.017	-1.000	-0.0144	-0.0180	-0.006
5.00	10.00	804.67	22.97	0.9321	0.013	0.017	0.113	0.0150	0.0187	0.006
10.00	10.00	804.67	22.97	0.9321	-0.030	0.016	-1.000	-0.0346	-0.0432	-0.013
15.00	10.00	804.67	22.97	0.9321	-0.020	0.020	-1.000	-0.0230	-0.0288	-0.009
20.00	10.00	804.67	22.97	0.9321	0.008	0.023	0.051	0.0092	0.0115	0.004
25.00	10.00	804.67	22.97	0.9321	0.017	0.031	0.082	0.0196	0.0245	0.008
30.00	10.00	804.67	22.97	0.9321	0.024	0.017	0.216	0.0276	0.0346	0.011

PROPELLER DYNAMOMETER
ep4qp2.pro Quad I 406 rpm 10m/s Rudder No. 2 X/D=0.39

Angle	V	RPM	Beta	J	Kt	Kq	n	Kt/J2	Kq/J2	Ct
-30.00	10.00	402.70	40.26	1.8625	-0.940	-0.125	2.224	-0.2706	-0.3383	-0.288
-20.00	10.00	402.70	40.26	1.8625	-1.010	-0.135	2.221	-0.2911	-0.3639	-0.310
-10.00	10.00	402.70	40.26	1.8625	-1.051	-0.132	2.365	-0.3027	-0.3784	-0.322
0.00	10.00	402.70	40.26	1.8625	-1.150	-0.129	2.634	-0.3313	-0.4141	-0.352
10.00	10.00	402.70	40.26	1.8625	-1.081	-0.131	2.440	-0.3115	-0.3894	-0.331
20.00	10.00	402.70	40.26	1.8625	-0.944	-0.126	2.224	-0.2718	-0.3398	-0.289
30.00	10.00	402.70	40.26	1.8625	-0.937	-0.117	2.368	-0.2701	-0.3376	-0.287

PROPELLER DYNAMOMETER
ep4qp36.pro Quad I 208 rpm 10m/s Rudder No. 2 X/D=0.39

Angle	V	RPM	Beta	J	Kt	Kq	n	Kt/J2	Kq/J2	Ct
-35.00	10.00	208.19	58.60	3.6025	-3.738	-0.541	3.963	-0.2880	-0.3600	-0.534
-30.00	10.00	208.19	58.60	3.6025	-3.618	-0.514	4.034	-0.2788	-0.3485	-0.517
-20.00	10.00	208.19	58.60	3.6025	-3.708	-0.485	4.383	-0.2857	-0.3571	-0.530
-10.00	10.00	208.19	58.60	3.6025	-3.573	-0.472	4.342	-0.2753	-0.3442	-0.511
0.00	10.00	208.19	58.60	3.6025	-3.573	-0.480	4.270	-0.2753	-0.3442	-0.511
10.00	10.00	208.19	58.60	3.6025	-3.813	-0.535	4.082	-0.2938	-0.3672	-0.545
20.00	10.00	208.19	58.60	3.6025	-3.798	-0.514	4.234	-0.2926	-0.3658	-0.543
30.00	10.00	208.19	58.60	3.6025	-3.902	-0.517	4.328	-0.3007	-0.3758	-0.558

PROPELLER DYNAMOMETER
ep4qp46.pro Quad I 0 rpm 10m/s Rudder No. 2 X/D=0.39

Angle	V	RPM	Beta	J	Kt	Kq	n	Kt/J2	Kq/J2	Ct
-35.00	10.00	0.09	89.98	8247.1960	-1.000	-1.000	1312.582	-0.4090	-0.5112	-1.277
-30.00	10.00	0.09	89.98	8247.1960	-1.000	-1.000	1312.582	-0.4009	-0.5011	-1.252
-20.00	10.00	0.09	89.98	8247.1960	-1.000	-1.000	1312.582	-0.3928	-0.4911	-1.226
-10.00	10.00	0.09	89.98	8247.1960	-1.000	-1.000	1312.582	-0.3848	-0.4810	-1.201
0.00	10.00	0.09	89.98	8247.1960	-1.000	-1.000	1312.582	-0.3733	-0.4666	-1.165
10.00	10.00	0.09	89.98	8247.1960	-1.000	-1.000	1312.582	-0.4262	-0.5328	-1.331
20.00	10.00	0.09	89.98	8247.1960	-1.000	-1.000	1312.582	-0.4355	-0.5443	-1.360
30.00	10.00	0.09	89.98	8247.1960	-1.000	-1.000	1312.582	-0.4424	-0.5530	-1.381
40.00	10.00	0.09	89.98	8247.1960	-1.000	-1.000	1312.582	-0.4516	-0.5645	-1.410

PROPELLER DYNAMOMETER
ep4qp38.pro Quad I 403 rpm 20m/s Rudder No. 2 X/D=0.39

Angle	V	RPM	Beta	J	Kt	Kq	n	Kt/J2	Kq/J2	Ct
-30.00	20.00	404.02	59.36	3.7127	-3.641	-0.462	4.655	-0.2641	-0.3301	-0.498
-20.00	20.00	404.02	59.36	3.7127	-3.728	-0.468	4.710	-0.2705	-0.3381	-0.510
-10.00	20.00	404.02	59.36	3.7127	-3.756	-0.469	4.731	-0.2725	-0.3407	-0.514
0.00	20.00	404.02	59.36	3.7127	-3.685	-0.464	4.697	-0.2673	-0.3341	-0.504
10.00	20.00	404.02	59.36	3.7127	-3.844	-0.481	4.727	-0.2789	-0.3486	-0.526
20.00	20.00	404.02	59.36	3.7127	-3.828	-0.478	4.735	-0.2777	-0.3472	-0.524
30.00	20.00	404.02	59.36	3.7127	-3.756	-0.477	4.653	-0.2725	-0.3407	-0.514

PROPELLER DYNAMOMETER
ep4qp28.pro Quad I 808 rpm 20m/s Rudder No. 2 X/D=0.39

Angle	V	RPM	Beta	J	Kt	Kq	n	Kt/J2	Kq/J2	Ct
-30.00	20.00	808.06	40.17	1.8563	-0.894	-0.123	2.152	-0.2595	-0.3244	-0.275
-20.00	20.00	808.06	40.17	1.8563	-0.955	-0.129	2.182	-0.2771	-0.3464	-0.294
-10.00	20.00	808.06	40.17	1.8563	-0.964	-0.132	2.155	-0.2798	-0.3497	-0.296
0.00	20.00	808.06	40.17	1.8563	-0.942	-0.132	2.109	-0.2734	-0.3417	-0.290
10.00	20.00	808.06	40.17	1.8563	-0.985	-0.134	2.167	-0.2858	-0.3573	-0.303
20.00	20.00	808.06	40.17	1.8563	-0.935	-0.131	2.116	-0.2714	-0.3392	-0.287
30.00	20.00	808.06	40.17	1.8563	-0.847	-0.119	2.102	-0.2459	-0.3074	-0.260

PROPELLER DYNAMOMETER
ep4qp58.pro Quad II -404 rpm 20m/s Rudder No. 2 X/D=0.39

Angle	V	RPM	Beta	J	Kt	Kq	n	Kt/J2	Kq/J2	Ct
-30.00	20.00	-403.38	120.60	3.7185	-4.902	-0.755	3.840	-0.3545	-0.4431	-0.669
-20.00	20.00	-403.38	120.60	3.7185	-4.946	-0.755	3.875	-0.3577	-0.4471	-0.675
-10.00	20.00	-403.38	120.60	3.7185	-4.978	-0.742	3.971	-0.3600	-0.4500	-0.679
10.00	20.00	-403.38	120.60	3.7185	-4.966	-0.770	3.819	-0.3591	-0.4489	-0.677
20.00	20.00	-403.38	120.60	3.7185	-4.970	-0.769	3.825	-0.3594	-0.4493	-0.678
30.00	20.00	-403.38	120.60	3.7185	-4.926	-0.765	3.809	-0.3562	-0.4453	-0.672

PROPELLER DYNAMOMETER
ep4qp68.pro Quad II -808 rpm 20m/s Rudder No. 2 X/D=0.39

Angle	V	RPM	Beta	J	Kt	Kq	n	Kt/J2	Kq/J2	Ct
-30.00	20.00	-806.55	139.78	1.8598	-2.020	-0.332	1.800	-0.5841	-0.7302	-0.620
-20.00	20.00	-806.55	139.78	1.8598	-2.041	-0.335	1.805	-0.5902	-0.7378	-0.627
-10.00	20.00	-806.55	139.78	1.8598	-2.065	-0.337	1.814	-0.5972	-0.7465	-0.634
0.00	20.00	-806.55	139.78	1.8598	-2.091	-0.339	1.826	-0.6044	-0.7555	-0.642
10.00	20.00	-806.55	139.78	1.8598	-2.087	-0.339	1.820	-0.6033	-0.7541	-0.641
20.00	20.00	-806.55	139.78	1.8598	-2.126	-0.341	1.842	-0.6146	-0.7682	-0.653
30.00	20.00	-806.55	139.78	1.8598	-2.107	-0.338	1.843	-0.6091	-0.7613	-0.647

PROPELLER DYNAMOMETER
ep4qp57.pro Quad II -213 rpm 10m/s Rudder No. 2 X/D=0.39

Angle	V	RPM	Beta	J	Kt	Kq	n	Kt/J2	Kq/J2	Ct
-35.00	10.00	-212.72	121.95	3.5258	-4.391	-0.715	3.447	-0.3533	-0.4416	-0.648
-30.00	10.00	-212.72	121.95	3.5258	-4.391	-0.715	3.447	-0.3533	-0.4416	-0.648
-20.00	10.00	-212.72	121.95	3.5258	-4.176	-0.705	3.325	-0.3359	-0.4199	-0.616
-10.00	10.00	-212.72	121.95	3.5258	-4.305	-0.700	3.453	-0.3463	-0.4329	-0.635
0.00	10.00	-212.72	121.95	3.5258	-4.291	-0.702	3.429	-0.3452	-0.4315	-0.633
10.00	10.00	-212.72	121.95	3.5258	-4.391	-0.751	3.283	-0.3533	-0.4416	-0.648
20.00	10.00	-212.72	121.95	3.5258	-4.205	-0.745	3.165	-0.3382	-0.4228	-0.620
30.00	10.00	-212.72	121.95	3.5258	-4.162	-0.753	3.101	-0.3348	-0.4185	-0.614
40.00	10.00	-212.72	121.95	3.5258	-3.918	-0.743	2.959	-0.3152	-0.3940	-0.578

PROPELLER DYNAMOMETER
ep4qp6.pro Quad II -407 rpm 10m/s Rudder No. 2 X/D=0.39

Angle	V	RPM	Beta	J	Kt	Kq	n	Kt/J2	Kq/J2	Ct
-35.00	10.00	-407.89	140.10	1.8387	-1.745	-0.337	1.515	-0.5160	-0.6451	-0.541
-30.00	10.00	-405.89	139.96	0.6083	-1.799	-0.338	0.553	-0.5267	-0.6584	-0.555
-20.00	10.00	-405.98	139.97	1.8474	-1.824	-0.338	1.589	-0.5348	-0.6685	-0.563
-10.00	10.00	-405.98	139.97	1.8474	-1.788	-0.336	1.568	-0.5239	-0.6549	-0.552
0.00	10.00	-405.98	139.97	1.8474	-1.943	-0.334	1.711	-0.5690	-0.7113	-0.600
10.00	10.00	-405.89	139.96	0.6083	-1.878	-0.353	0.589	-0.5500	-0.6875	-0.580
20.00	10.00	-405.89	139.96	0.6083	-1.857	-0.352	0.534	-0.5438	-0.6797	-0.573
30.00	10.00	-405.89	139.96	0.6083	-1.914	-0.344	0.593	-0.5605	-0.7006	-0.591
40.00	10.00	-407.89	140.10	1.8387	-1.792	-0.336	1.562	-0.5299	-0.6624	-0.555

PROPELLER DYNAMOMETER
ep4qp7.pro Quad II -804 rpm 10m/s Rudder No. 2 X/D=0.39

Angle	V	RPM	Beta	J	Kt	Kq	n	Kt/J2	Kq/J2	Ct
-35.00	10.00	-804.66	157.03	0.9321	-0.703	-0.124	0.843	-0.8093	-1.0116	-0.314
-30.00	10.00	-805.57	157.05	0.9310	-0.719	-0.126	0.846	-0.8293	-1.0366	-0.321
-25.00	10.00	-804.66	157.03	0.9321	-0.715	-0.121	0.877	-0.8231	-1.0289	-0.319
-20.00	10.00	-805.57	157.05	0.9310	-0.703	-0.125	0.838	-0.8115	-1.0144	-0.314
-15.00	10.00	-804.66	157.03	0.9321	-0.667	-0.119	0.833	-0.7677	-0.9596	-0.298
-10.00	10.00	-805.57	157.05	0.9310	-0.672	-0.121	0.827	-0.7748	-0.9685	-0.300
-5.00	10.00	-804.66	157.03	0.9321	-0.641	-0.119	0.797	-0.7377	-0.9221	-0.286
0.00	10.00	-805.57	157.05	0.9310	-0.686	-0.118	0.861	-0.7914	-0.9893	-0.306
5.00	10.00	-804.66	157.03	0.9321	-0.652	-0.121	0.801	-0.7504	-0.9380	-0.291
10.00	10.00	-805.57	157.05	0.9310	-0.692	-0.126	0.820	-0.7988	-0.9985	-0.309
15.00	10.00	-804.66	157.03	0.9321	-0.693	-0.121	0.852	-0.7977	-0.9972	-0.309
20.00	10.00	-805.57	157.05	0.9310	-0.710	-0.129	0.824	-0.8192	-1.0240	-0.317
25.00	10.00	-804.66	157.03	0.9321	-0.714	-0.122	0.867	-0.8220	-1.0274	-0.319
30.00	10.00	-805.57	157.05	0.9310	-0.737	-0.134	0.818	-0.8498	-1.0622	-0.329
35.00	10.00	-804.66	157.03	0.9321	-0.685	-0.127	0.803	-0.7885	-0.9856	-0.306
40.00	10.00	-804.66	157.03	0.9321	-0.681	-0.126	0.799	-0.7839	-0.9798	-0.304

PROPELLER DYNAMOMETER
ep4qp87.pro Quad II -1453 rpm 10m/s Rudder No. 2 X/D=0.39

Angle	V	RPM	Beta	J	Kt	Kq	n	Kt/J2	Kq/J2	Ct
-35.00	10.00	-1453.39	166.79	0.5160	-0.343	-0.065	0.434	-1.2872	-1.6090	-0.171
-30.00	10.00	-1453.39	166.79	0.5160	-0.308	-0.062	0.408	-1.1579	-1.4474	-0.154
-25.00	10.00	-1453.39	166.79	0.5160	-0.346	-0.066	0.432	-1.3011	-1.6263	-0.173
-20.00	10.00	-1453.39	166.79	0.5160	-0.363	-0.059	0.502	-1.3634	-1.7043	-0.181
-15.00	10.00	-1453.39	166.79	0.5160	-0.373	-0.057	0.542	-1.4003	-1.7504	-0.186
-10.00	10.00	-1453.39	166.79	0.5160	-0.289	-0.059	0.401	-1.0840	-1.3550	-0.144
-5.00	10.00	-1453.39	166.79	0.5160	-0.279	-0.060	0.383	-1.0459	-1.3074	-0.139
0.00	10.00	-1453.39	166.79	0.5160	-0.362	-0.060	0.493	-1.3599	-1.6999	-0.181
5.00	10.00	-1453.39	166.79	0.5160	-0.331	-0.056	0.485	-1.2422	-1.5527	-0.165
10.00	10.00	-1453.39	166.79	0.5160	-0.294	-0.057	0.422	-1.1048	-1.3810	-0.147
15.00	10.00	-1453.39	166.79	0.5160	-0.246	-0.053	0.378	-0.9224	-1.1530	-0.123
20.00	10.00	-1453.39	166.79	0.5160	-0.307	-0.057	0.442	-1.1521	-1.4402	-0.153

25.00	10.00	-1453.39	166.79	0.5160	-0.312	-0.053	0.486	-1.1706	-1.4633	-0.156
30.00	10.00	-1453.39	166.79	0.5160	-0.299	-0.055	0.446	-1.1221	-1.4026	-0.149
35.00	10.00	-1453.39	166.79	0.5160	-0.286	-0.056	0.422	-1.0736	-1.3420	-0.143
40.00	10.00	-1453.39	166.79	0.5160	-0.291	-0.058	0.411	-1.0944	-1.3680	-0.145

PROPELLER DYNAMOMETER
ep4qp930.pro Quad III -2105 rpm -10m/s Rudder No. 2 X/D=0.39

Angle	V	RPM	Beta	J	Kt	Kq	n	Kt/J2	Kq/J2	Ct
-30.00	-10.00	-2105.90	189.20	0.3561	-0.229	-0.041	0.315	-1.8034	-2.2543	-0.117
-25.00	-10.00	-2105.90	189.20	0.3561	-0.219	-0.039	0.315	-1.7280	-2.1600	-0.112
-20.00	-10.00	-2105.90	189.20	0.3561	-0.210	-0.038	0.311	-1.6572	-2.0715	-0.108
-15.00	-10.00	-2105.90	189.20	0.3561	-0.204	-0.037	0.316	-1.6050	-2.0062	-0.105
-10.00	-10.00	-2105.90	189.20	0.3561	-0.203	-0.037	0.311	-1.5992	-1.9989	-0.104
-5.00	-10.00	-2105.90	189.20	0.3561	-0.192	-0.035	0.308	-1.5110	-1.8887	-0.098
0.00	-10.00	-2105.90	189.20	0.3561	-0.185	-0.035	0.303	-1.4599	-1.8249	-0.095
5.00	-10.00	-2105.90	189.20	0.3561	-0.197	-0.034	0.326	-1.5527	-1.9409	-0.101
10.00	-10.00	-2105.90	189.20	0.3561	-0.195	-0.034	0.326	-1.5388	-1.9235	-0.100
15.00	-10.00	-2105.90	189.20	0.3561	-0.201	-0.034	0.331	-1.5829	-1.9786	-0.103
20.00	-10.00	-2105.90	189.20	0.3561	-0.203	-0.035	0.325	-1.6038	-2.0047	-0.104
25.00	-10.00	-2105.90	189.20	0.3561	-0.212	-0.036	0.333	-1.6734	-2.0918	-0.109
30.00	-10.00	-2105.90	189.20	0.3561	-0.216	-0.036	0.337	-1.7024	-2.1280	-0.111
35.00	-10.00	-2105.90	189.20	0.3561	-0.216	-0.037	0.335	-1.7059	-2.1324	-0.111
40.00	-10.00	-2105.90	189.20	0.3561	-0.221	-0.037	0.340	-1.7396	-2.1745	-0.113

PROPELLER DYNAMOMETER
ep4qp10.pro Quad III -1460 rpm -10m/s Rudder No. 2 X/D=0.39

Angle	V	RPM	Beta	J	Kt	Kq	n	Kt/J2	Kq/J2	Ct
-35.00	-10.00	-1463.59	193.12	0.5124	-0.167	-0.038	0.359	-0.6371	-0.7964	-0.084
-30.00	-10.00	-1461.44	193.14	0.5132	-0.151	-0.035	0.352	-0.5731	-0.7164	-0.075
-25.00	-10.00	-1463.59	193.12	0.5124	-0.172	-0.032	0.435	-0.6534	-0.8167	-0.086
-20.00	-10.00	-1461.44	193.14	0.5132	-0.156	-0.031	0.405	-0.5923	-0.7404	-0.078
-15.00	-10.00	-1463.59	193.12	0.5124	-0.130	-0.028	0.377	-0.4967	-0.6209	-0.065
-10.00	-10.00	-1461.44	193.14	0.5132	-0.118	-0.028	0.342	-0.4485	-0.5606	-0.059
-5.00	-10.00	-1463.59	193.12	0.5124	-0.101	-0.026	0.315	-0.3864	-0.4830	-0.051
0.00	-10.00	-1461.44	193.14	0.5132	-0.124	-0.026	0.391	-0.4713	-0.5891	-0.062
5.00	-10.00	-1463.59	193.12	0.5124	-0.138	-0.025	0.446	-0.5269	-0.6586	-0.069
10.00	-10.00	-1461.44	193.14	0.5132	-0.102	-0.025	0.329	-0.3872	-0.4840	-0.051
15.00	-10.00	-1463.59	193.12	0.5124	-0.097	-0.026	0.306	-0.3679	-0.4598	-0.048
20.00	-10.00	-1461.44	193.14	0.5132	-0.112	-0.029	0.313	-0.4237	-0.5296	-0.056
25.00	-10.00	-1463.59	193.12	0.5124	-0.179	-0.030	0.479	-0.6812	-0.8515	-0.089
30.00	-10.00	-1461.44	193.14	0.5132	-0.150	-0.033	0.375	-0.5678	-0.7097	-0.075
35.00	-10.00	-1463.59	193.12	0.5124	-0.154	-0.034	0.372	-0.5849	-0.7311	-0.077
40.00	-10.00	-1463.59	193.12	0.5124	-0.166	-0.035	0.384	-0.6325	-0.7906	-0.083

PROPELLER DYNAMOMETER
ep4qp11.pro Quad III -804 rpm -10m/s Rudder No. 2 X/D=0.39

Angle	V	RPM	Beta	J	Kt	Kq	n	Kt/J2	Kq/J2	Ct
-30.00	-10.00	-804.34	202.98	0.9325	0.028	-0.023	-1.000	0.0326	0.0407	0.013
-25.00	-10.00	-805.24	202.95	0.9314	0.062	-0.014	-1.000	0.0720	0.0899	0.028
-20.00	-10.00	-804.64	202.97	0.9321	0.090	-0.008	-1.000	0.1038	0.1298	0.040
-15.00	-10.00	-805.24	202.95	0.9314	0.108	-0.002	-1.000	0.1242	0.1552	0.048
-10.00	-10.00	-804.64	202.97	0.9321	0.166	0.001	19.836	0.1907	0.2384	0.074
-5.00	-10.00	-805.24	202.95	0.9314	0.185	0.004	7.694	0.2135	0.2669	0.083
0.00	-10.00	-804.34	202.98	0.9325	0.194	0.003	8.771	0.2228	0.2785	0.086
5.00	-10.00	-805.24	202.95	0.9314	0.194	0.005	5.978	0.2240	0.2800	0.087
10.00	-10.00	-804.64	202.97	0.9321	0.203	0.004	8.309	0.2333	0.2917	0.090
15.00	-10.00	-805.24	202.95	0.9314	0.140	0.000	116.248	0.1613	0.2016	0.063
20.00	-10.00	-804.64	202.97	0.9321	0.095	-0.010	-1.000	0.1097	0.1371	0.043
25.00	-10.00	-805.24	202.95	0.9314	0.028	-0.017	-1.000	0.0325	0.0406	0.013
30.00	-10.00	-804.64	202.97	0.9321	-0.009	-0.024	-0.220	-0.0106	-0.0132	-0.004

PROPELLER DYNAMOMETER
ep4qp1230.pro Quad III -402 rpm -10m/s Rudder No. 2 X/D=0.39

Angle	V	RPM	Beta	J	Kt	Kq	n	Kt/J2	Kq/J2	Ct
-20.00	-10.00	-402.58	220.27	1.8630	0.797	0.095	2.490	0.2298	0.2872	0.245
-15.00	-10.00	-402.58	220.27	1.8630	1.007	0.116	2.581	0.2901	0.3627	0.309
-10.00	-10.00	-402.58	220.27	1.8630	1.132	0.150	2.238	0.3261	0.4076	0.347
-5.00	-10.00	-402.58	220.27	1.8630	1.224	0.155	2.343	0.3528	0.4410	0.375
0.00	-10.00	-402.58	220.27	1.8630	1.232	0.163	2.245	0.3551	0.4439	0.378
5.00	-10.00	-402.58	220.27	1.8630	1.281	0.163	2.323	0.3690	0.4613	0.393
10.00	-10.00	-402.58	220.27	1.8630	1.273	0.164	2.298	0.3667	0.4584	0.390
15.00	-10.00	-402.58	220.27	1.8630	1.116	0.133	2.478	0.3215	0.4018	0.342
20.00	-10.00	-402.58	220.27	1.8630	0.806	0.091	2.634	0.2321	0.2901	0.247
25.00	-10.00	-402.58	220.27	1.8630	0.572	0.051	3.299	0.1648	0.2060	0.175

PROPELLER DYNAMOMETER
ep4qp1430.pro Quad IV 400 rpm -10m/s Rudder No. 2 X/D=0.39

Angle	V	RPM	Beta	J	Kt	Kq	n	Kt/J2	Kq/J2	Ct
-20.00	-10.00	409.59	320.22	1.8311	1.482	0.203	2.131	0.4421	0.5527	0.461
-15.00	-10.00	409.59	320.22	1.8311	1.716	0.243	2.060	0.5118	0.6397	0.534
-10.00	-10.00	409.59	320.22	1.8311	1.938	0.263	2.143	0.5779	0.7224	0.603
-5.00	-10.00	409.59	320.22	1.8311	2.027	0.282	2.094	0.6046	0.7558	0.630
0.00	-10.00	409.59	320.22	1.8311	2.047	0.290	2.059	0.6104	0.7630	0.636
5.00	-10.00	409.59	320.22	1.8311	1.984	0.279	2.070	0.5918	0.7398	0.617
10.00	-10.00	409.59	320.22	1.8311	1.914	0.279	2.002	0.5710	0.7137	0.595
20.00	-10.00	409.59	320.22	1.8311	1.595	0.228	2.037	0.4758	0.5948	0.496
25.00	-10.00	409.59	320.22	1.8311	1.311	0.191	2.000	0.3911	0.4889	0.408
30.00	-10.00	409.59	320.22	1.8311	1.187	0.168	2.064	0.3540	0.4424	0.369
35.00	-10.00	409.59	320.22	1.8311	1.051	0.147	2.084	0.3133	0.3917	0.327

PROPELLER DYNAMOMETER
ep4qp15.pro Quad IV 806 rpm -10m/s Rudder No. 2 X/D=0.39

Angle	V	RPM	Beta	J	Kt	Kq	n	Kt/J2	Kq/J2	Ct
-30.00	-10.00	805.76	337.06	0.9308	0.516	0.072	1.061	0.5954	0.7442	0.230
-25.00	-10.00	807.22	337.10	0.9291	0.555	0.077	1.072	0.6429	0.8036	0.248
-20.00	-10.00	805.76	337.06	0.9308	0.587	0.079	1.103	0.6772	0.8465	0.262
-15.00	-10.00	807.22	337.10	0.9291	0.612	0.086	1.058	0.7091	0.8863	0.273
-10.00	-10.00	805.76	337.06	0.9308	0.677	0.089	1.126	0.7818	0.9773	0.302
-5.00	-10.00	807.22	337.10	0.9291	0.711	0.095	1.111	0.8239	1.0299	0.318
0.00	-10.00	805.76	337.06	0.9308	0.730	0.093	1.162	0.8427	1.0533	0.326
5.00	-10.00	807.22	337.10	0.9291	0.694	0.093	1.101	0.8042	1.0053	0.310
10.00	-10.00	805.76	337.06	0.9308	0.706	0.090	1.158	0.8148	1.0185	0.315
15.00	-10.00	807.22	337.10	0.9291	0.657	0.087	1.115	0.7613	0.9516	0.294
20.00	-10.00	805.76	337.06	0.9308	0.603	0.081	1.106	0.6959	0.8698	0.269
25.00	-10.00	807.22	337.10	0.9291	0.566	0.078	1.069	0.6557	0.8196	0.253
30.00	-10.00	805.76	337.06	0.9308	0.516	0.072	1.059	0.5958	0.7447	0.230
35.00	-10.00	807.22	337.10	0.9291	0.495	0.069	1.054	0.5733	0.7166	0.221

PROPELLER DYNAMOMETER
ep4qp1630.pro Quad IV 1460 rpm -10m/s Rudder No. 2 X/D=0.39

Angle	V	RPM	Beta	J	Kt	Kq	n	Kt/J2	Kq/J2	Ct
-20.00	-10.00	1455.58	346.81	0.5153	0.340	0.051	0.547	1.2823	1.6029	0.170
-10.00	-10.00	1455.58	346.81	0.5153	0.389	0.052	0.610	1.4634	1.8292	0.194
0.00	-10.00	1455.58	346.81	0.5153	0.383	0.053	0.596	1.4425	1.8031	0.191
20.00	-10.00	1455.58	346.81	0.5153	0.301	0.049	0.507	1.1338	1.4173	0.150

APPENDIX C SPANWISE NORMAL FORCE

Local Distribution
1qpp4.d QUADRANT I +10m/s +400 -30deg

Angle	V	RPM	Span	Cn	Cmz	Cmx	Cpc
-30.40	10.00	400.00	0.0000	-0.809	-0.011	-0.0566	31.992
-30.40	10.00	400.00	0.0700	-0.809	-0.011	-0.0566	31.992
-30.40	10.00	400.00	0.2300	-0.838	-0.005	-0.1928	30.813
-30.40	10.00	400.00	0.4000	-0.712	-0.011	-0.2849	32.326
-30.40	10.00	400.00	0.5300	-0.656	-0.024	-0.3476	35.528
-30.40	10.00	400.00	0.7000	-0.656	-0.021	-0.4592	34.714
-30.40	10.00	400.00	0.8300	-0.641	-0.033	-0.5321	37.669
-30.40	10.00	400.00	0.9400	-0.510	-0.028	-0.4796	38.304
-30.40	10.00	400.00	0.9700	-0.503	-0.020	-0.4877	35.867
-30.40	10.00	400.00	1.0000	0.000	0.000	0.0000	0.000

Local Distribution
2qpp4.d QUADRANT I +10m/s +400 -20deg

Angle	V	RPM	Span	Cn	Cmz	Cmx	Cpc
-20.40	10.00	400.00	0.0000	-0.605	0.013	-0.0424	26.763
-20.40	10.00	400.00	0.0700	-0.605	0.013	-0.0424	26.763
-20.40	10.00	400.00	0.2300	-0.609	0.014	-0.1402	26.450
-20.40	10.00	400.00	0.4000	-0.476	0.011	-0.1903	26.511
-20.40	10.00	400.00	0.5300	-0.542	0.004	-0.2870	28.852
-20.40	10.00	400.00	0.7000	-0.563	0.026	-0.3941	23.150
-20.40	10.00	400.00	0.8300	-0.611	0.025	-0.5071	23.752
-20.40	10.00	400.00	0.9400	-0.598	-0.016	-0.5625	33.931
-20.40	10.00	400.00	0.9700	-0.627	-0.023	-0.6081	35.586
-20.40	10.00	400.00	1.0000	0.000	0.000	0.0000	0.000

Local Distribution
3qpp4.d QUADRANT I +10m/s +400 -10deg

Angle	V	RPM	Span	Cn	Cmz	Cmx	Cpc
-10.40	10.00	400.00	0.0000	-0.306	0.026	-0.0214	17.218
-10.40	10.00	400.00	0.0700	-0.306	0.026	-0.0214	17.218
-10.40	10.00	400.00	0.2300	-0.242	0.015	-0.0557	20.717
-10.40	10.00	400.00	0.4000	-0.151	-0.003	-0.0603	32.931
-10.40	10.00	400.00	0.5300	-0.204	-0.003	-0.1081	32.481
-10.40	10.00	400.00	0.7000	-0.363	0.021	-0.2539	21.490
-10.40	10.00	400.00	0.8300	-0.393	0.028	-0.3264	19.339
-10.40	10.00	400.00	0.9400	-0.340	0.008	-0.3199	26.425
-10.40	10.00	400.00	0.9700	-0.324	-0.003	-0.3142	31.594
-10.40	10.00	400.00	1.0000	0.000	0.000	0.0000	0.000

Local Distribution
4qpp4.d QUADRANT I +10m/s +400 0deg

Angle	V	RPM	Span	Cn	Cmz	Cmx	Cpc
-0.40	10.00	400.00	0.0000	0.056	0.007	0.0039	47.563
-0.40	10.00	400.00	0.0700	0.056	0.007	0.0039	47.563
-0.40	10.00	400.00	0.2300	0.145	-0.001	0.0333	28.961
-0.40	10.00	400.00	0.4000	0.169	-0.022	0.0678	10.666
-0.40	10.00	400.00	0.5300	0.112	-0.014	0.0592	10.700
-0.40	10.00	400.00	0.7000	-0.079	0.009	-0.0553	11.973
-0.40	10.00	400.00	0.8300	-0.146	0.016	-0.1208	13.596
-0.40	10.00	400.00	0.9400	-0.119	0.008	-0.1122	20.285
-0.40	10.00	400.00	0.9700	-0.119	0.002	-0.1154	27.914
-0.40	10.00	400.00	1.0000	0.000	0.000	0.0000	0.000

Local Distribution
5qpp4.d QUADRANT I +10m/s +400 10deg

Angle	V	RPM	Span	Cn	Cmz	Cmx	Cpc
9.60	10.00	400.00	0.0000	0.458	-0.010	0.0321	26.792
9.60	10.00	400.00	0.0700	0.458	-0.010	0.0321	26.792
9.60	10.00	400.00	0.2300	0.444	-0.020	0.1021	23.159
9.60	10.00	400.00	0.4000	0.483	-0.031	0.1932	20.504
9.60	10.00	400.00	0.5300	0.407	-0.022	0.2156	21.700
9.60	10.00	400.00	0.7000	0.148	0.004	0.1039	33.942
9.60	10.00	400.00	0.8300	0.060	0.006	0.0495	45.338
9.60	10.00	400.00	0.9400	0.149	0.014	0.1397	43.808
9.60	10.00	400.00	0.9700	0.152	0.012	0.1470	41.885
9.60	10.00	400.00	1.0000	0.000	0.000	0.0000	0.000

Local Distribution
6qpp4.d QUADRANT I +10m/s +400 20deg

Angle	V	RPM	Span	Cn	Cmz	Cmx	Cpc
19.60	10.00	400.00	0.0000	0.680	-0.012	0.0476	27.349
19.60	10.00	400.00	0.0700	0.680	-0.012	0.0476	27.349
19.60	10.00	400.00	0.2300	0.600	0.001	0.1380	30.334
19.60	10.00	400.00	0.4000	0.659	0.004	0.2636	30.944
19.60	10.00	400.00	0.5300	0.618	0.009	0.3277	32.279
19.60	10.00	400.00	0.7000	0.371	-0.002	0.2599	29.141
19.60	10.00	400.00	0.8300	0.342	0.004	0.2837	31.735
19.60	10.00	400.00	0.9400	0.406	0.023	0.3815	38.641
19.60	10.00	400.00	0.9700	0.391	0.023	0.3796	38.659
19.60	10.00	400.00	1.0000	0.000	0.000	0.0000	0.000

Local Distribution
7qpp4.d QUADRANT I +10m/s +400 30deg

Angle	V	RPM	Span	Cn	Cmz	Cmx	Cpc
29.60	10.00	400.00	0.0000	0.768	0.014	0.0538	32.655
29.60	10.00	400.00	0.0700	0.768	0.014	0.0538	32.655
29.60	10.00	400.00	0.2300	0.681	0.032	0.1567	36.981
29.60	10.00	400.00	0.4000	0.620	0.032	0.2480	37.751
29.60	10.00	400.00	0.5300	0.657	0.036	0.3483	38.306
29.60	10.00	400.00	0.7000	0.463	0.040	0.3244	42.816
29.60	10.00	400.00	0.8300	0.458	0.028	0.3802	39.199
29.60	10.00	400.00	0.9400	0.473	0.026	0.4446	38.098
29.60	10.00	400.00	0.9700	0.469	0.031	0.4546	39.906
29.60	10.00	400.00	1.0000	0.000	0.000	0.0000	0.000

Local Distribution
1qpm4.d QUADRANT II +10m/s -400 -30deg

Angle	V	RPM	Span	Cn	Cmz	Cmx	Cpc
-30.40	10.00	400.00	0.0000	-0.454	0.018	-0.0318	24.126
-30.40	10.00	400.00	0.0700	-0.454	0.018	-0.0318	24.126
-30.40	10.00	400.00	0.2300	-0.183	-0.025	-0.0422	50.565
-30.40	10.00	400.00	0.4000	-0.043	-0.014	-0.0171	78.173
-30.40	10.00	400.00	0.5300	-0.047	-0.011	-0.0251	63.372
-30.40	10.00	400.00	0.7000	-0.169	-0.019	-0.1184	47.251
-30.40	10.00	400.00	0.8300	-0.176	-0.017	-0.1458	44.637
-30.40	10.00	400.00	0.9400	-0.163	-0.030	-0.1536	57.096
-30.40	10.00	400.00	0.9700	-0.149	-0.031	-0.1442	61.655
-30.40	10.00	400.00	1.0000	0.000	0.000	0.0000	0.000

Local Distribution
2qpm4.d QUADRANT II +10m/s -400 -20deg

Angle	V	RPM	Span	Cn	Cmz	Cmx	Cpc
-20.40	10.00	400.00	0.0000	-0.223	0.026	-0.0156	12.412
-20.40	10.00	400.00	0.0700	-0.223	0.026	-0.0156	12.412
-20.40	10.00	400.00	0.2300	-0.008	-0.006	-0.0018	152.864
-20.40	10.00	400.00	0.4000	-0.014	-0.004	-0.0056	72.888
-20.40	10.00	400.00	0.5300	-0.055	-0.008	-0.0290	52.979
-20.40	10.00	400.00	0.7000	-0.120	-0.001	-0.0843	31.342
-20.40	10.00	400.00	0.8300	-0.191	-0.015	-0.1583	41.737
-20.40	10.00	400.00	0.9400	-0.132	-0.018	-0.1244	50.104
-20.40	10.00	400.00	0.9700	-0.122	-0.011	-0.1182	43.884
-20.40	10.00	400.00	1.0000	0.000	0.000	0.0000	0.000

Local Distribution
3qpm4.d QUADRANT II +10m/s -400 -10deg

Angle	V	RPM	Span	Cn	Cmz	Cmx	Cpc
-10.40	10.00	400.00	0.0000	-0.082	0.015	-0.0058	2.828
-10.40	10.00	400.00	0.0700	-0.082	0.015	-0.0058	2.828
-10.40	10.00	400.00	0.2300	-0.036	0.004	-0.0084	15.461
-10.40	10.00	400.00	0.4000	-0.041	0.001	-0.0164	28.048
-10.40	10.00	400.00	0.5300	-0.073	-0.006	-0.0388	42.258
-10.40	10.00	400.00	0.7000	-0.159	-0.009	-0.1111	38.117
-10.40	10.00	400.00	0.8300	-0.154	-0.023	-0.1280	52.671
-10.40	10.00	400.00	0.9400	-0.160	-0.021	-0.1500	50.182
-10.40	10.00	400.00	0.9700	-0.133	-0.017	-0.1288	49.233
-10.40	10.00	400.00	1.0000	0.000	0.000	0.0000	0.000

Local Distribution
4qpm4.d QUADRANT II +10m/s -400 0deg

Angle	V	RPM	Span	Cn	Cmz	Cmx	Cpc
-0.40	10.00	400.00	0.0000	0.081	-0.005	0.0057	21.617
-0.40	10.00	400.00	0.0700	0.081	-0.005	0.0057	21.617
-0.40	10.00	400.00	0.2300	0.061	0.004	0.0140	40.063
-0.40	10.00	400.00	0.4000	-0.007	0.002	-0.0027	-5.573
-0.40	10.00	400.00	0.5300	-0.067	-0.009	-0.0354	49.658
-0.40	10.00	400.00	0.7000	-0.078	0.001	-0.0543	27.154
-0.40	10.00	400.00	0.8300	-0.118	-0.009	-0.0977	41.065
-0.40	10.00	400.00	0.9400	-0.069	-0.009	-0.0652	48.763
-0.40	10.00	400.00	0.9700	-0.124	-0.014	-0.1202	47.453
-0.40	10.00	400.00	1.0000	0.000	0.000	0.0000	0.000

Local Distribution
5qpm4.d QUADRANT II +10m/s -400 10deg

Angle	V	RPM	Span	Cn	Cmz	Cmx	Cpc
9.60	10.00	400.00	0.0000	0.265	-0.026	0.0186	15.292
9.60	10.00	400.00	0.0700	0.265	-0.026	0.0186	15.292
9.60	10.00	400.00	0.2300	0.221	0.001	0.0509	30.487
9.60	10.00	400.00	0.4000	0.046	0.000	0.0184	30.481
9.60	10.00	400.00	0.5300	-0.008	0.002	-0.0044	-13.359
9.60	10.00	400.00	0.7000	-0.024	0.010	-0.0170	-31.406
9.60	10.00	400.00	0.8300	-0.093	0.008	-0.0769	17.620
9.60	10.00	400.00	0.9400	-0.012	0.003	-0.0115	-6.161
9.60	10.00	400.00	0.9700	-0.029	0.000	-0.0281	27.526
9.60	10.00	400.00	1.0000	0.000	0.000	0.0000	0.000

Local Distribution
6qpm4.d QUADRANT II +10m/s -400 20deg

Angle	V	RPM	Span	Cn	Cmz	Cmx	Cpc
19.60	10.00	400.00	0.0000	0.444	-0.030	0.0311	19.767
19.60	10.00	400.00	0.0700	0.444	-0.030	0.0311	19.767
19.60	10.00	400.00	0.2300	0.281	0.005	0.0647	32.760
19.60	10.00	400.00	0.4000	0.053	0.008	0.0212	52.752
19.60	10.00	400.00	0.5300	-0.031	0.005	-0.0164	6.406
19.60	10.00	400.00	0.7000	-0.031	0.005	-0.0219	6.581
19.60	10.00	400.00	0.8300	-0.044	0.009	-0.0365	-2.387
19.60	10.00	400.00	0.9400	0.026	0.021	0.0244	148.589
19.60	10.00	400.00	0.9700	-0.038	0.009	-0.0372	-5.915
19.60	10.00	400.00	1.0000	0.000	0.000	0.0000	0.000

Local Distribution
7qpm4.d QUADRANT II +10m/s -400 30deg

Angle	V	RPM	Span	Cn	Cmz	Cmx	Cpc
29.60	10.00	400.00	0.0000	0.644	-0.020	0.0451	25.393
29.60	10.00	400.00	0.0700	0.644	-0.020	0.0451	25.393
29.60	10.00	400.00	0.2300	0.456	0.015	0.1049	34.896
29.60	10.00	400.00	0.4000	0.137	0.027	0.0549	58.964
29.60	10.00	400.00	0.5300	0.009	0.017	0.0046	313.753
29.60	10.00	400.00	0.7000	-0.040	0.011	-0.0277	-12.004
29.60	10.00	400.00	0.8300	-0.041	0.014	-0.0337	-20.597
29.60	10.00	400.00	0.9400	0.064	0.023	0.0605	83.513
29.60	10.00	400.00	0.9700	0.026	0.021	0.0248	151.032
29.60	10.00	400.00	1.0000	0.000	0.000	0.0000	0.000

Local Distribution
1qpm8.d QUADRANT II +10m/s -800 -30deg

Angle	V	RPM	Span	Cn	Cmz	Cmx	Cpc
-30.40	10.00	800.00	0.0000	0.101	0.036	0.0071	83.351
-30.40	10.00	800.00	0.0700	0.101	0.036	0.0071	83.351
-30.40	10.00	800.00	0.2300	0.407	0.017	0.0935	36.324
-30.40	10.00	800.00	0.4000	0.330	0.006	0.1321	32.526
-30.40	10.00	800.00	0.5300	0.175	0.007	0.0925	35.851
-30.40	10.00	800.00	0.7000	0.004	-0.023	0.0025	-921.240
-30.40	10.00	800.00	0.8300	-0.062	-0.030	-0.0518	101.968
-30.40	10.00	800.00	0.9400	-0.018	-0.048	-0.0171	428.218
-30.40	10.00	800.00	0.9700	0.008	-0.034	0.0074	-632.632
-30.40	10.00	800.00	1.0000	0.000	0.000	0.0000	0.000

Local Distribution
2qpm8.d QUADRANT II +10m/s -800 -20deg

Angle	V	RPM	Span	Cn	Cmz	Cmx	Cpc
-20.40	10.00	800.00	0.0000	0.272	0.034	0.0190	49.022
-20.40	10.00	800.00	0.0700	0.272	0.034	0.0190	49.022
-20.40	10.00	800.00	0.2300	0.440	0.033	0.1013	41.286
-20.40	10.00	800.00	0.4000	0.286	0.021	0.1143	40.870
-20.40	10.00	800.00	0.5300	0.165	0.012	0.0877	40.821
-20.40	10.00	800.00	0.7000	0.050	-0.003	0.0348	19.423
-20.40	10.00	800.00	0.8300	0.077	0.008	0.0643	44.822
-20.40	10.00	800.00	0.9400	0.015	-0.031	0.0144	-276.067
-20.40	10.00	800.00	0.9700	0.039	-0.021	0.0382	-51.869
-20.40	10.00	800.00	1.0000	0.000	0.000	0.0000	0.000

Local Distribution
3qpm8.d QUADRANT II +10m/s -800 -10deg

Angle	V	RPM	Span	Cn	Cmz	Cmx	Cpc
-10.40	10.00	800.00	0.0000	0.075	0.022	0.0053	74.495
-10.40	10.00	800.00	0.0700	0.075	0.022	0.0053	74.495
-10.40	10.00	800.00	0.2300	0.329	0.032	0.0756	44.554
-10.40	10.00	800.00	0.4000	0.200	0.019	0.0799	44.352
-10.40	10.00	800.00	0.5300	0.135	0.021	0.0714	53.433
-10.40	10.00	800.00	0.7000	-0.062	-0.009	-0.0431	52.257
-10.40	10.00	800.00	0.8300	-0.099	-0.016	-0.0818	54.884
-10.40	10.00	800.00	0.9400	-0.090	-0.040	-0.0844	96.748
-10.40	10.00	800.00	0.9700	-0.012	-0.028	-0.0112	398.425
-10.40	10.00	800.00	1.0000	0.000	0.000	0.0000	0.000

Local Distribution
4qpm8.d QUADRANT II +10m/s -800 0deg

Angle	V	RPM	Span	Cn	Cmz	Cmx	Cpc
-0.40	10.00	800.00	0.0000	-0.128	-0.022	-0.0089	56.039
-0.40	10.00	800.00	0.0700	-0.128	-0.022	-0.0089	56.039
-0.40	10.00	800.00	0.2300	0.066	0.006	0.0152	42.531
-0.40	10.00	800.00	0.4000	0.068	0.011	0.0273	53.975
-0.40	10.00	800.00	0.5300	0.017	0.011	0.0091	125.032
-0.40	10.00	800.00	0.7000	-0.065	-0.006	-0.0454	44.437
-0.40	10.00	800.00	0.8300	-0.158	-0.028	-0.1312	56.377
-0.40	10.00	800.00	0.9400	-0.236	-0.045	-0.2214	58.613
-0.40	10.00	800.00	0.9700	-0.230	-0.047	-0.2234	60.710
-0.40	10.00	800.00	1.0000	0.000	0.000	0.0000	0.000

Local Distribution
5qpm8.d QUADRANT II +10m/s -800 10deg

Angle	V	RPM	Span	Cn	Cmz	Cmx	Cpc
9.60	10.00	800.00	0.0000	-0.074	-0.046	-0.0052	122.650
9.60	10.00	800.00	0.0700	-0.074	-0.046	-0.0052	122.650
9.60	10.00	800.00	0.2300	0.016	0.006	0.0036	85.248
9.60	10.00	800.00	0.4000	-0.003	0.013	-0.0014	-552.216
9.60	10.00	800.00	0.5300	-0.059	-0.004	-0.0315	40.262
9.60	10.00	800.00	0.7000	-0.129	0.001	-0.0902	28.559
9.60	10.00	800.00	0.8300	-0.204	-0.020	-0.1689	44.453
9.60	10.00	800.00	0.9400	-0.328	-0.051	-0.3085	53.491
9.60	10.00	800.00	0.9700	-0.258	-0.048	-0.2502	57.946
9.60	10.00	800.00	1.0000	0.000	0.000	0.0000	0.000

Local Distribution
6qpm8.d QUADRANT II +10m/s -800 20deg

Angle	V	RPM	Span	Cn	Cmz	Cmx	Cpc
19.60	10.00	800.00	0.0000	0.017	-0.048	0.0012	-378.059
19.60	10.00	800.00	0.0700	0.017	-0.048	0.0012	-378.059
19.60	10.00	800.00	0.2300	-0.005	0.010	-0.0011	-287.307
19.60	10.00	800.00	0.4000	-0.092	0.015	-0.0366	4.655
19.60	10.00	800.00	0.5300	-0.113	0.000	-0.0597	29.581
19.60	10.00	800.00	0.7000	-0.107	0.003	-0.0749	25.733
19.60	10.00	800.00	0.8300	-0.165	-0.026	-0.1367	53.374
19.60	10.00	800.00	0.9400	-0.297	-0.035	-0.2788	47.763
19.60	10.00	800.00	0.9700	-0.196	-0.029	-0.1906	51.835
19.60	10.00	800.00	1.0000	0.000	0.000	0.0000	0.000

Local Distribution
7qpm8.d QUADRANT II +10m/s -800 30deg

Angle	V	RPM	Span	Cn	Cmz	Cmx	Cpc
29.60	10.00	800.00	0.0000	0.205	-0.028	0.0144	9.529
29.60	10.00	800.00	0.0700	0.205	-0.028	0.0144	9.529
29.60	10.00	800.00	0.2300	0.096	0.029	0.0221	75.365
29.60	10.00	800.00	0.4000	-0.122	0.027	-0.0489	-3.094
29.60	10.00	800.00	0.5300	-0.106	0.012	-0.0562	12.483
29.60	10.00	800.00	0.7000	-0.186	-0.006	-0.1304	34.496
29.60	10.00	800.00	0.8300	-0.238	-0.011	-0.1979	36.829
29.60	10.00	800.00	0.9400	-0.226	-0.031	-0.2126	50.587
29.60	10.00	800.00	0.9700	-0.184	-0.017	-0.1782	44.148
29.60	10.00	800.00	1.0000	0.000	0.000	0.0000	0.000

Local Distribution
1qmm8.d QUADRANT III-10m/s -800 -30deg

Angle	V	RPM	Span	Cn	Cmz	Cmx	Cpc
-30.40	10.00	800.00	0.0000	0.751	0.182	0.0526	66.345
-30.40	10.00	800.00	0.0700	0.751	0.182	0.0526	66.345
-30.40	10.00	800.00	0.2300	0.768	0.178	0.1766	64.765
-30.40	10.00	800.00	0.4000	0.795	0.186	0.3180	65.016
-30.40	10.00	800.00	0.5300	0.882	0.192	0.4672	62.710
-30.40	10.00	800.00	0.7000	0.833	0.186	0.5830	63.531
-30.40	10.00	800.00	0.8300	0.798	0.187	0.6624	65.099
-30.40	10.00	800.00	0.9400	0.767	0.175	0.7213	64.272
-30.40	10.00	800.00	0.9700	0.676	0.153	0.6561	63.914
-30.40	10.00	800.00	1.0000	0.000	0.000	0.0000	0.000

Local Distribution
2qmm8.d QUADRANT III-10m/s -800 -20deg

Angle	V	RPM	Span	Cn	Cmz	Cmx	Cpc
-20.40	10.00	800.00	0.0000	0.565	0.144	0.0395	68.349
-20.40	10.00	800.00	0.0700	0.565	0.144	0.0395	68.349
-20.40	10.00	800.00	0.2300	0.571	0.139	0.1313	66.499
-20.40	10.00	800.00	0.4000	0.633	0.153	0.2532	66.124
-20.40	10.00	800.00	0.5300	0.635	0.142	0.3367	63.456
-20.40	10.00	800.00	0.7000	0.575	0.153	0.4027	69.779
-20.40	10.00	800.00	0.8300	0.527	0.142	0.4372	70.523
-20.40	10.00	800.00	0.9400	0.642	0.125	0.6036	59.139
-20.40	10.00	800.00	0.9700	0.636	0.099	0.6166	53.391
-20.40	10.00	800.00	1.0000	0.000	0.000	0.0000	0.000

Local Distribution
3qmm8.d QUADRANT III-10m/s -800 -10deg

Angle	V	RPM	Span	Cn	Cmz	Cmx	Cpc
-10.40	10.00	800.00	0.0000	0.617	0.173	0.0432	71.906
-10.40	10.00	800.00	0.0700	0.617	0.173	0.0432	71.906
-10.40	10.00	800.00	0.2300	0.590	0.170	0.1357	73.182
-10.40	10.00	800.00	0.4000	0.555	0.153	0.2221	71.340
-10.40	10.00	800.00	0.5300	0.547	0.148	0.2899	70.447
-10.40	10.00	800.00	0.7000	0.349	0.119	0.2445	81.168
-10.40	10.00	800.00	0.8300	0.400	0.107	0.3320	70.267
-10.40	10.00	800.00	0.9400	0.386	0.078	0.3628	60.473
-10.40	10.00	800.00	0.9700	0.333	0.031	0.3233	43.866
-10.40	10.00	800.00	1.0000	0.000	0.000	0.0000	0.000

Local Distribution
4qmm8.d QUADRANT III-10m/s -800 0deg

Angle	V	RPM	Span	Cn	Cmz	Cmx	Cpc
-0.40	10.00	800.00	0.0000	0.066	0.015	0.0046	64.048
-0.40	10.00	800.00	0.0700	0.066	0.015	0.0046	64.048
-0.40	10.00	800.00	0.2300	0.101	0.011	0.0232	46.689
-0.40	10.00	800.00	0.4000	0.070	0.006	0.0281	43.733
-0.40	10.00	800.00	0.5300	0.103	0.002	0.0545	33.585
-0.40	10.00	800.00	0.7000	0.053	0.014	0.0372	69.768
-0.40	10.00	800.00	0.8300	0.043	0.003	0.0359	40.945
-0.40	10.00	800.00	0.9400	0.040	0.000	0.0380	31.529
-0.40	10.00	800.00	0.9700	0.076	-0.004	0.0737	21.965
-0.40	10.00	800.00	1.0000	0.000	0.000	0.0000	0.000

Local Distribution
5qmm8.d QUADRANT III-10m/s -800 10deg

Angle	V	RPM	Span	Cn	Cmz	Cmx	Cpc
9.60	10.00	800.00	0.0000	-0.382	-0.119	-0.0267	76.498
9.60	10.00	800.00	0.0700	-0.382	-0.119	-0.0267	76.498
9.60	10.00	800.00	0.2300	-0.411	-0.135	-0.0945	79.244
9.60	10.00	800.00	0.4000	-0.348	-0.135	-0.1392	88.038
9.60	10.00	800.00	0.5300	-0.369	-0.138	-0.1955	86.246
9.60	10.00	800.00	0.7000	-0.349	-0.114	-0.2444	79.106
9.60	10.00	800.00	0.8300	-0.253	-0.080	-0.2099	77.570
9.60	10.00	800.00	0.9400	-0.212	-0.067	-0.1996	77.228
9.60	10.00	800.00	0.9700	-0.230	-0.037	-0.2227	54.205
9.60	10.00	800.00	1.0000	0.000	0.000	0.0000	0.000

Local Distribution
6qmm8.d QUADRANT III-10m/s -800 20deg

Angle	V	RPM	Span	Cn	Cmz	Cmx	Cpc
19.60	10.00	800.00	0.0000	-0.543	-0.150	-0.0380	71.346
19.60	10.00	800.00	0.0700	-0.543	-0.150	-0.0380	71.346
19.60	10.00	800.00	0.2300	-0.607	-0.158	-0.1396	68.889
19.60	10.00	800.00	0.4000	-0.595	-0.158	-0.2378	69.765
19.60	10.00	800.00	0.5300	-0.663	-0.165	-0.3514	67.239
19.60	10.00	800.00	0.7000	-0.588	-0.148	-0.4114	67.710
19.60	10.00	800.00	0.8300	-0.480	-0.120	-0.3981	67.428
19.60	10.00	800.00	0.9400	-0.578	-0.132	-0.5435	64.199
19.60	10.00	800.00	0.9700	-0.603	-0.116	-0.5850	58.823
19.60	10.00	800.00	1.0000	0.000	0.000	0.0000	0.000

Local Distribution
7qmm8.d QUADRANT III-10m/s -800 30deg

Angle	V	RPM	Span	Cn	Cmz	Cmx	Cpc
29.60	10.00	800.00	0.0000	-0.777	-0.194	-0.0544	67.503
29.60	10.00	800.00	0.0700	-0.777	-0.194	-0.0544	67.503
29.60	10.00	800.00	0.2300	-0.804	-0.196	-0.1850	66.533
29.60	10.00	800.00	0.4000	-0.817	-0.196	-0.3266	65.898
29.60	10.00	800.00	0.5300	-0.878	-0.202	-0.4655	64.515
29.60	10.00	800.00	0.7000	-0.872	-0.188	-0.6107	62.300
29.60	10.00	800.00	0.8300	-0.707	-0.169	-0.5869	65.786
29.60	10.00	800.00	0.9400	-0.729	-0.178	-0.6853	66.535
29.60	10.00	800.00	0.9700	-0.701	-0.162	-0.6804	64.618
29.60	10.00	800.00	1.0000	0.000	0.000	0.0000	0.000

Local Distribution
1qmm14.d QUADRANT III-10m/s -1460 -30deg

Angle	V	RPM	Span	Cn	Cmz	Cmx	Cpc
-30.40	10.00	1460.00	0.0000	1.032	0.229	0.0722	63.221
-30.40	10.00	1460.00	0.0700	1.032	0.229	0.0722	63.221
-30.40	10.00	1460.00	0.2300	1.049	0.232	0.2412	63.179
-30.40	10.00	1460.00	0.4000	1.032	0.240	0.4129	64.828
-30.40	10.00	1460.00	0.5300	1.106	0.247	0.5863	63.405
-30.40	10.00	1460.00	0.7000	1.012	0.232	0.7084	64.349
-30.40	10.00	1460.00	0.8300	0.820	0.229	0.6809	71.914
-30.40	10.00	1460.00	0.9400	1.115	0.189	1.0485	55.425
-30.40	10.00	1460.00	0.9700	0.882	0.122	0.8553	50.672
-30.40	10.00	1460.00	1.0000	0.000	0.000	0.0000	0.000

Local Distribution
2qmm14.d QUADRANT III-10m/s -1460 -20deg

Angle	V	RPM	Span	Cn	Cmz	Cmx	Cpc
-20.40	10.00	1460.00	0.0000	0.822	0.192	0.0575	64.991
-20.40	10.00	1460.00	0.0700	0.822	0.192	0.0575	64.991
-20.40	10.00	1460.00	0.2300	0.841	0.198	0.1934	65.245
-20.40	10.00	1460.00	0.4000	0.819	0.192	0.3276	65.131
-20.40	10.00	1460.00	0.5300	0.863	0.202	0.4575	65.042
-20.40	10.00	1460.00	0.7000	0.766	0.201	0.5362	69.351
-20.40	10.00	1460.00	0.8300	0.704	0.198	0.5844	72.078
-20.40	10.00	1460.00	0.9400	0.797	0.151	0.7487	58.435
-20.40	10.00	1460.00	0.9700	0.678	0.091	0.6573	50.219
-20.40	10.00	1460.00	1.0000	0.000	0.000	0.0000	0.000

Local Distribution
3qmm14.d QUADRANT III-10m/s -1460 -10deg

Angle	V	RPM	Span	Cn	Cmz	Cmx	Cpc
-10.40	10.00	1460.00	0.0000	0.570	0.172	0.0399	75.224
-10.40	10.00	1460.00	0.0700	0.570	0.172	0.0399	75.224
-10.40	10.00	1460.00	0.2300	0.591	0.163	0.1359	71.426
-10.40	10.00	1460.00	0.4000	0.600	0.159	0.2401	69.754
-10.40	10.00	1460.00	0.5300	0.596	0.154	0.3158	68.731
-10.40	10.00	1460.00	0.7000	0.508	0.137	0.3558	70.382
-10.40	10.00	1460.00	0.8300	0.430	0.116	0.3565	70.424
-10.40	10.00	1460.00	0.9400	0.387	0.067	0.3641	56.026
-10.40	10.00	1460.00	0.9700	0.409	0.024	0.3965	38.964
-10.40	10.00	1460.00	1.0000	0.000	0.000	0.0000	0.000

Local Distribution
4qmm14.d QUADRANT III-10m/s -1460 0deg

Angle	V	RPM	Span	Cn	Cmz	Cmx	Cpc
-0.40	10.00	1460.00	0.0000	0.050	0.017	0.0035	80.392
-0.40	10.00	1460.00	0.0700	0.050	0.017	0.0035	80.392
-0.40	10.00	1460.00	0.2300	0.108	0.013	0.0248	48.150
-0.40	10.00	1460.00	0.4000	0.081	0.006	0.0322	40.734
-0.40	10.00	1460.00	0.5300	0.116	0.008	0.0615	40.464
-0.40	10.00	1460.00	0.7000	0.068	0.016	0.0474	64.875
-0.40	10.00	1460.00	0.8300	0.086	0.002	0.0715	33.643
-0.40	10.00	1460.00	0.9400	0.059	0.003	0.0552	37.830
-0.40	10.00	1460.00	0.9700	0.093	-0.002	0.0905	26.482
-0.40	10.00	1460.00	1.0000	0.000	0.000	0.0000	0.000

Local Distribution
5qmm14.d QUADRANT III-10m/s -1460 10deg

Angle	V	RPM	Span	Cn	Cmz	Cmx	Cpc
9.60	10.00	1460.00	0.0000	-0.388	-0.124	-0.0271	78.051
9.60	10.00	1460.00	0.0700	-0.388	-0.124	-0.0271	78.051
9.60	10.00	1460.00	0.2300	-0.379	-0.139	-0.0872	85.137
9.60	10.00	1460.00	0.4000	-0.378	-0.141	-0.1511	86.134
9.60	10.00	1460.00	0.5300	-0.371	-0.143	-0.1966	87.630
9.60	10.00	1460.00	0.7000	-0.390	-0.120	-0.2728	76.323
9.60	10.00	1460.00	0.8300	-0.266	-0.087	-0.2207	79.060
9.60	10.00	1460.00	0.9400	-0.230	-0.065	-0.2163	72.121
9.60	10.00	1460.00	0.9700	-0.302	-0.037	-0.2932	48.363
9.60	10.00	1460.00	1.0000	0.000	0.000	0.0000	0.000

Local Distribution
6qmm14.d QUADRANT III-10m/s -1460 20deg

Angle	V	RPM	Span	Cn	Cmz	Cmx	Cpc
19.60	10.00	1460.00	0.0000	-0.780	-0.209	-0.0546	70.213
19.60	10.00	1460.00	0.0700	-0.780	-0.209	-0.0546	70.213
19.60	10.00	1460.00	0.2300	-0.813	-0.213	-0.1870	69.210
19.60	10.00	1460.00	0.4000	-0.715	-0.196	-0.2862	71.096
19.60	10.00	1460.00	0.5300	-0.727	-0.203	-0.3853	71.933
19.60	10.00	1460.00	0.7000	-0.699	-0.182	-0.4891	69.110
19.60	10.00	1460.00	0.8300	-0.586	-0.126	-0.4866	62.309
19.60	10.00	1460.00	0.9400	-0.662	-0.162	-0.6220	66.673
19.60	10.00	1460.00	0.9700	-0.669	-0.106	-0.6486	53.796
19.60	10.00	1460.00	1.0000	0.000	0.000	0.0000	0.000

Local Distribution
7qmm14.d QUADRANT III-10m/s -1460 30deg

Angle	V	RPM	Span	Cn	Cmz	Cmx	Cpc
29.60	10.00	1460.00	0.0000	-1.057	-0.233	-0.0740	63.078
29.60	10.00	1460.00	0.0700	-1.057	-0.233	-0.0740	63.078
29.60	10.00	1460.00	0.2300	-1.107	-0.248	-0.2547	63.533
29.60	10.00	1460.00	0.4000	-1.114	-0.248	-0.4457	63.412
29.60	10.00	1460.00	0.5300	-1.114	-0.222	-0.5902	59.810
29.60	10.00	1460.00	0.7000	-1.131	-0.244	-0.7914	62.291
29.60	10.00	1460.00	0.8300	-0.801	-0.135	-0.6648	55.227
29.60	10.00	1460.00	0.9400	-1.023	-0.226	-0.9621	63.061
29.60	10.00	1460.00	0.9700	-1.005	-0.188	-0.9744	58.083
29.60	10.00	1460.00	1.0000	0.000	0.000	0.0000	0.000

Local Distribution
1qmp8.d QUADRANT IV -10m/s +800 -30deg

Angle	V	RPM	Span	Cn	Cmz	Cmx	Cpc
-30.40	10.00	800.00	0.0000	0.500	0.131	0.0350	69.320
-30.40	10.00	800.00	0.0700	0.500	0.131	0.0350	69.320
-30.40	10.00	800.00	0.2300	0.519	0.135	0.1195	68.942
-30.40	10.00	800.00	0.4000	0.511	0.131	0.2044	68.491
-30.40	10.00	800.00	0.5300	0.510	0.132	0.2701	68.864
-30.40	10.00	800.00	0.7000	0.452	0.123	0.3164	70.782
-30.40	10.00	800.00	0.8300	0.410	0.116	0.3405	72.225
-30.40	10.00	800.00	0.9400	0.438	0.109	0.4117	67.220
-30.40	10.00	800.00	0.9700	0.367	0.094	0.3564	68.359
-30.40	10.00	800.00	1.0000	0.000	0.000	0.0000	0.000

Local Distribution
2qmp8.d QUADRANT IV -10m/s +800 -20deg

Angle	V	RPM	Span	Cn	Cmz	Cmx	Cpc
-20.40	10.00	800.00	0.0000	0.273	0.088	0.0191	78.192
-20.40	10.00	800.00	0.0700	0.273	0.088	0.0191	78.192
-20.40	10.00	800.00	0.2300	0.303	0.089	0.0696	74.191
-20.40	10.00	800.00	0.4000	0.320	0.084	0.1279	69.190
-20.40	10.00	800.00	0.5300	0.306	0.084	0.1623	70.926
-20.40	10.00	800.00	0.7000	0.305	0.083	0.2133	71.019
-20.40	10.00	800.00	0.8300	0.228	0.073	0.1893	78.009
-20.40	10.00	800.00	0.9400	0.277	0.077	0.2608	71.331
-20.40	10.00	800.00	0.9700	0.223	0.064	0.2166	72.660
-20.40	10.00	800.00	1.0000	0.000	0.000	0.0000	0.000

Local Distribution
3qmp8.d QUADRANT IV -10m/s +800 -10deg

Angle	V	RPM	Span	Cn	Cmz	Cmx	Cpc
-10.40	10.00	800.00	0.0000	0.209	0.089	0.0146	93.950
-10.40	10.00	800.00	0.0700	0.209	0.089	0.0146	93.950
-10.40	10.00	800.00	0.2300	0.198	0.087	0.0455	96.075
-10.40	10.00	800.00	0.4000	0.172	0.081	0.0686	101.178
-10.40	10.00	800.00	0.5300	0.138	0.078	0.0731	114.558
-10.40	10.00	800.00	0.7000	0.109	0.065	0.0766	118.723
-10.40	10.00	800.00	0.8300	0.074	0.057	0.0618	143.751
-10.40	10.00	800.00	0.9400	0.088	0.048	0.0823	113.036
-10.40	10.00	800.00	0.9700	0.013	0.027	0.0121	352.923
-10.40	10.00	800.00	1.0000	0.000	0.000	0.0000	0.000

Local Distribution
4qmp8.d QUADRANT IV -10m/s +800 0deg

Angle	V	RPM	Span	Cn	Cmz	Cmx	Cpc
-0.40	10.00	800.00	0.0000	0.002	0.012	0.0001	1097.738
-0.40	10.00	800.00	0.0700	0.002	0.012	0.0001	1097.738
-0.40	10.00	800.00	0.2300	-0.019	0.003	-0.0044	4.483
-0.40	10.00	800.00	0.4000	0.054	0.001	0.0217	33.716
-0.40	10.00	800.00	0.5300	0.014	-0.003	0.0072	-5.478
-0.40	10.00	800.00	0.7000	0.077	0.006	0.0541	40.797
-0.40	10.00	800.00	0.8300	-0.073	-0.008	-0.0608	45.748
-0.40	10.00	800.00	0.9400	0.007	-0.001	0.0066	6.211
-0.40	10.00	800.00	0.9700	0.002	-0.001	0.0018	-70.732
-0.40	10.00	800.00	1.0000	0.000	0.000	0.0000	0.000

Local Distribution
5qmp8.d QUADRANT IV -10m/s +800 10deg

Angle	V	RPM	Span	Cn	Cmz	Cmx	Cpc
9.60	10.00	800.00	0.0000	-0.077	-0.074	-0.0054	174.570
9.60	10.00	800.00	0.0700	-0.077	-0.074	-0.0054	174.570
9.60	10.00	800.00	0.2300	-0.060	-0.076	-0.0138	220.680
9.60	10.00	800.00	0.4000	-0.061	-0.075	-0.0245	213.630
9.60	10.00	800.00	0.5300	-0.064	-0.076	-0.0338	209.642
9.60	10.00	800.00	0.7000	-0.093	-0.065	-0.0649	134.335
9.60	10.00	800.00	0.8300	-0.065	-0.062	-0.0541	172.906
9.60	10.00	800.00	0.9400	-0.019	-0.045	-0.0174	396.413
9.60	10.00	800.00	0.9700	0.004	-0.029	0.0043	-937.732
9.60	10.00	800.00	1.0000	0.000	0.000	0.0000	0.000

Local Distribution
6qmp8.d QUADRANT IV -10m/s +800 20deg

Angle	V	RPM	Span	Cn	Cmz	Cmx	Cpc
19.60	10.00	800.00	0.0000	-0.243	-0.081	-0.0170	79.739
19.60	10.00	800.00	0.0700	-0.243	-0.081	-0.0170	79.739
19.60	10.00	800.00	0.2300	-0.301	-0.090	-0.0692	74.906
19.60	10.00	800.00	0.4000	-0.289	-0.089	-0.1156	76.360
19.60	10.00	800.00	0.5300	-0.328	-0.096	-0.1737	73.994
19.60	10.00	800.00	0.7000	-0.301	-0.085	-0.2107	72.167
19.60	10.00	800.00	0.8300	-0.324	-0.088	-0.2692	70.483
19.60	10.00	800.00	0.9400	-0.289	-0.098	-0.2721	80.522
19.60	10.00	800.00	0.9700	-0.231	-0.072	-0.2241	76.861
19.60	10.00	800.00	1.0000	0.000	0.000	0.0000	0.000

Local Distribution
7qmp8.d QUADRANT IV -10m/s +800 30deg

Angle	V	RPM	Span	Cn	Cmz	Cmx	Cpc
29.60	10.00	800.00	0.0000	-0.514	-0.136	-0.0360	69.581
29.60	10.00	800.00	0.0700	-0.514	-0.136	-0.0360	69.581
29.60	10.00	800.00	0.2300	-0.511	-0.141	-0.1175	71.218
29.60	10.00	800.00	0.4000	-0.518	-0.139	-0.2072	70.345
29.60	10.00	800.00	0.5300	-0.536	-0.142	-0.2839	69.760
29.60	10.00	800.00	0.7000	-0.543	-0.133	-0.3801	66.690
29.60	10.00	800.00	0.8300	-0.504	-0.122	-0.4184	66.279
29.60	10.00	800.00	0.9400	-0.455	-0.123	-0.4277	70.496
29.60	10.00	800.00	0.9700	-0.401	-0.106	-0.3894	69.405
29.60	10.00	800.00	1.0000	0.000	0.000	0.0000	0.000

APPENDIX D RUDDER PRESSURE COEFFICIENTS

QUADRANT I +10m/s +400rpm File: Qpp4p3.dat Span is : 0.07 m No: 1

Incidence		-30	-20	-10	0	10	20	30
%c	%t/c							
0.0	0.00	-3.500	-1.638	0.250	1.015	0.385	-1.138	-2.167
2.5	4.36	-3.758	-3.072	-1.721	-0.191	0.769	1.046	1.030
5.0	5.93	-2.318	-2.565	-1.603	-0.426	0.446	0.908	1.030
10.0	7.81	-1.470	-1.609	-1.368	-0.559	0.138	0.600	0.833
20.0	9.57	-1.106	-0.971	-0.985	-0.529	-0.092	0.338	0.455
30.0	10.01	-0.985	-0.797	-0.750	-0.515	-0.215	0.169	0.318
40.0	9.68	-0.924	-0.696	-0.588	-0.397	-0.231	0.031	0.136
50.0	8.83	-0.818	-0.565	-0.471	-0.338	-0.215	-0.062	0.030
60.0	7.61	-0.788	-0.449	-0.382	-0.294	-0.215	-0.123	-0.076
70.0	6.11	-0.667	-0.406	-0.250	-0.191	-0.185	-0.123	-0.167
80.0	4.37	-0.621	-0.304	-0.132	-0.103	-0.123	-0.138	-0.258
90.0	2.41	-0.576	-0.420	-0.015	0.000	-0.185	-0.169	-0.379
95.0	1.35	-0.500	-0.217	0.029	0.044	-0.092	-0.215	-0.500
95.0	-1.35	-0.242	-0.101	-0.015	0.000	-0.123	-0.338	-0.758
90.0	-2.41	-0.152	-0.087	-0.059	-0.044	-0.231	-0.508	-0.848
80.0	-4.37	-0.076	-0.058	-0.118	-0.147	-0.338	-0.385	-0.909
70.0	-6.11	0.015	-0.058	-0.191	-0.250	-0.446	-0.492	-0.879
60.0	-7.61	0.076	0.014	-0.235	-0.368	-0.585	-0.646	-0.848
50.0	-8.83	0.182	0.000	-0.279	-0.544	-0.708	-0.708	-0.970
40.0	-9.68	0.273	0.058	-0.309	-0.574	-0.938	-0.908	-0.818
30.0	-10.01	0.348	0.145	-0.235	-0.559	-1.062	-1.015	-0.848
20.0	-9.57	0.591	0.304	-0.132	-0.662	-1.292	-1.400	-0.848
10.0	-7.81	0.909	0.652	0.118	-0.706	-1.585	-1.908	-1.894
5.0	-5.93	1.212	1.072	0.574	-0.353	-1.815	-2.908	-2.712
2.5	-4.36	0.970	1.217	0.926	-0.029	-1.554	-2.492	-3.015

QUADRANT I +10m/s +400rpm File: Qpp4p3.dat Span is : 0.23 m No: 2

Incidence		-30	-20	-10	0	10	20	30
%c	%t/c							
0.0	0.00	-3.409	-1.522	0.138	0.485	-0.561	-2.188	-1.939
2.5	4.36	-3.924	-2.821	-1.200	0.029	0.667	0.672	0.530
5.0	5.93	-3.045	-2.433	-1.215	-0.176	0.500	0.672	0.788
10.0	7.81	-2.182	-1.866	-1.169	-0.412	0.242	0.547	0.773
20.0	9.57	-1.318	-1.313	-1.015	-0.529	-0.061	0.266	0.530
30.0	10.01	-0.970	-0.970	-0.815	-0.500	-0.182	0.063	0.303
40.0	9.68	-0.833	-0.761	-0.631	-0.456	-0.197	-0.047	0.167
50.0	8.83	-0.773	-0.582	-0.492	-0.382	-0.197	-0.094	0.045
60.0	7.61	-0.697	-0.463	-0.369	-0.294	-0.212	-0.219	-0.030
70.0	6.11	-0.712	-0.418	-0.277	-0.221	-0.182	-0.172	-0.121
80.0	4.37	-0.606	-0.284	-0.169	-0.162	-0.091	-0.188	-0.242
90.0	2.41	-0.652	-0.224	-0.031	-0.059	-0.076	-0.328	-0.348
95.0	1.35	-0.636	-0.149	0.046	0.000	-0.045	-0.359	-0.424
95.0	-1.35	-0.273	0.000	0.031	0.029	-0.045	-0.453	-0.712
90.0	-2.41	-0.182	-0.090	-0.031	-0.088	-0.121	-0.547	-0.727
80.0	-4.37	-0.106	-0.030	-0.123	-0.221	-0.197	-0.609	-0.864
70.0	-6.11	0.000	-0.030	-0.200	-0.324	-0.273	-0.719	-0.833
60.0	-7.61	0.030	-0.045	-0.262	-0.441	-0.470	-0.844	-0.970
50.0	-8.83	0.152	0.000	-0.308	-0.559	-0.606	-0.828	-0.894
40.0	-9.68	0.242	0.015	-0.338	-0.676	-0.833	-0.859	-0.970

30.0	-10.01	0.394	0.104	-0.400	-0.912	-1.167	-0.656	-0.788
20.0	-9.57	0.606	0.299	-0.277	-0.824	-1.288	-1.141	-1.106
10.0	-7.81	0.606	0.672	-0.077	-0.882	-1.530	-1.328	-1.409
5.0	-5.93	0.758	0.761	0.215	-0.779	-2.061	-2.906	-1.227
2.5	-4.36	0.955	0.239	0.477	-0.647	-1.803	-2.375	-0.682

QUADRANT I +10m/s +400rpm File: Qpp4p3.dat Span is : 0.40 m No: 3

Incidence		-30	-20	-10	0	10	20	30
%c	%t/c							
0.0	0.00	-1.288	-0.090	0.672	0.118	-1.621	-2.985	-0.939
2.5	4.36	-2.924	-1.821	-0.358	0.544	0.773	0.561	0.576
5.0	5.93	-2.394	-1.776	-0.612	0.250	0.742	0.803	0.833
10.0	7.81	-1.970	-1.627	-0.821	-0.088	0.455	0.758	0.848
20.0	9.57	-1.288	-1.254	-0.821	-0.324	0.106	0.394	0.591
30.0	10.01	-1.015	-1.000	-0.716	-0.397	-0.061	0.182	0.364
40.0	9.68	-0.864	-0.776	-0.597	-0.353	-0.136	0.061	0.197
50.0	8.83	-0.788	-0.627	-0.493	-0.338	-0.167	-0.045	0.061
60.0	7.61	-0.727	-0.507	-0.403	-0.294	-0.167	-0.106	-0.045
70.0	6.11	-0.742	-0.388	-0.313	-0.235	-0.182	-0.106	-0.152
80.0	4.37	-0.689	-0.254	-0.209	-0.162	-0.167	-0.182	-0.212
90.0	2.41	-0.636	-0.119	-0.075	-0.088	-0.136	-0.197	-0.333
95.0	1.35	-0.636	-0.045	0.000	-0.044	-0.136	-0.258	-0.424
95.0	-1.35	-0.288	-0.045	0.000	-0.015	-0.182	-0.409	-0.682
90.0	-2.41	-0.258	-0.090	-0.060	-0.044	-0.212	-0.545	-0.682
80.0	-4.37	-0.136	-0.104	-0.134	-0.118	-0.258	-0.576	-0.803
70.0	-6.11	-0.076	-0.104	-0.179	-0.206	-0.318	-0.636	-0.864
60.0	-7.61	-0.076	-0.104	-0.224	-0.294	-0.364	-0.742	-0.833
50.0	-8.83	-0.015	-0.090	-0.269	-0.382	-0.470	-0.879	-0.864
40.0	-9.68	0.076	-0.060	-0.299	-0.500	-0.621	-0.939	-0.803
30.0	-10.01	0.182	-0.015	-0.373	-0.706	-0.924	-0.879	-0.833
20.0	-9.57	0.288	0.060	-0.358	-0.765	-1.182	-0.924	-0.833
10.0	-7.81	0.455	0.164	-0.373	-1.074	-1.788	-1.500	-0.833
5.0	-5.93	0.621	0.343	-0.269	-1.206	-2.515	-1.470	-0.788
2.5	-4.36	0.606	0.478	-0.119	-1.250	-2.818	-4.000	-0.864

QUADRANT I +10m/s +400rpm File: Qpp4p3.dat Span is : 0.53 m No: 4

Incidence		-30	-20	-10	0	10	20	30
%c	%t/c							
0.0	0.00	-1.090	-1.045	-0.224	-0.272	-0.806	-0.197	0.277
2.5	4.36	-2.299	-1.866	-0.388	0.426	0.642	0.576	0.523
5.0	5.93	-1.881	-1.851	-0.672	0.162	0.597	0.712	0.785
10.0	7.81	-1.343	-1.746	-0.896	-0.206	0.343	0.621	0.754
20.0	9.57	-1.000	-1.328	-0.881	-0.397	0.030	0.348	0.523
30.0	10.01	-0.925	-1.045	-0.746	-0.412	-0.104	0.152	0.354
40.0	9.68	-0.851	-0.821	-0.612	-0.382	-0.164	0.015	0.185
50.0	8.83	-0.806	-0.672	-0.507	-0.338	-0.179	-0.030	0.077
60.0	7.61	-0.806	-0.522	-0.403	-0.279	-0.164	-0.136	-0.031
70.0	6.11	-0.761	-0.403	-0.313	-0.235	-0.164	-0.121	-0.123
80.0	4.37	-0.716	-0.284	-0.209	-0.147	-0.119	-0.152	-0.215
90.0	2.41	-0.627	-0.134	-0.104	-0.074	-0.090	-0.152	-0.354
95.0	1.35	-0.493	-0.075	-0.030	-0.029	-0.045	-0.318	-0.446
95.0	-1.35	-0.328	-0.030	0.000	0.000	-0.060	-0.455	-0.708
90.0	-2.41	-0.254	-0.030	-0.045	-0.044	-0.119	-0.621	-0.738
80.0	-4.37	-0.104	-0.045	-0.104	-0.132	-0.209	-0.652	-0.862

70.0	-6.11	-0.060	-0.030	-0.149	-0.221	-0.284	-0.636	-0.877
60.0	-7.61	0.015	-0.015	-0.179	-0.279	-0.373	-0.758	-0.908
50.0	-8.83	0.060	-0.015	-0.239	-0.382	-0.507	-0.773	-0.908
40.0	-9.68	0.149	0.000	-0.254	-0.471	-0.672	-0.758	-0.877
30.0	-10.01	0.239	0.045	-0.328	-0.618	-0.881	-0.712	-1.000
20.0	-9.57	0.343	0.119	-0.239	-0.632	-1.030	-0.909	-0.923
10.0	-7.81	0.478	0.239	-0.194	-0.779	-1.433	-1.409	-0.923
5.0	-5.93	0.463	0.328	-0.134	-0.882	-1.866	-2.015	-0.892
2.5	-4.36	0.373	0.388	-0.060	-0.971	-2.254	-3.242	-0.985

QUADRANT I +10m/s +400rpm File: Qpp4p3.dat Span is : 0.70 m No: 5

Incidence		-30	-20	-10	0	10	20	30
%c	%t/c							
0.0	0.00	-2.258	-3.057	-1.070	0.203	0.667	0.290	-0.758
2.5	4.36	-1.129	-3.143	-1.718	-0.725	0.106	0.565	0.606
5.0	5.93	-0.581	-2.057	-1.324	-0.536	0.030	0.580	0.742
10.0	7.81	-0.387	-1.186	-0.662	-0.217	0.136	0.652	0.712
20.0	9.57	-0.194	-0.429	-0.296	0.130	0.364	0.681	0.606
30.0	10.01	-0.032	-0.071	0.014	0.362	0.439	0.667	0.500
40.0	9.68	0.048	0.243	0.239	0.377	0.561	0.667	0.576
50.0	8.83	0.161	0.257	0.394	0.435	0.606	0.580	0.788
60.0	7.61	0.016	0.271	0.338	0.377	0.409	0.406	0.621
70.0	6.11	-0.161	-0.029	0.014	0.101	0.045	0.261	0.212
80.0	4.37	-0.516	-0.071	-0.056	-0.014	0.015	0.087	-0.030
90.0	2.41	-0.516	-0.100	-0.056	0.072	0.061	-0.058	-0.167
95.0	1.35	-0.419	0.014	0.056	0.072	0.121	0.014	-0.333
95.0	-1.35	-0.065	0.057	0.070	0.159	0.121	-0.014	-0.530
90.0	-2.41	-0.016	0.071	0.183	0.145	0.136	0.087	-0.561
80.0	-4.37	0.210	0.229	0.183	0.174	0.000	-0.043	-0.409
70.0	-6.11	0.403	0.286	0.254	0.232	0.106	-0.101	-0.470
60.0	-7.61	0.548	0.457	0.254	0.203	0.076	0.000	-0.318
50.0	-8.83	0.758	0.557	0.352	0.290	0.136	0.000	-0.303
40.0	-9.68	0.903	0.729	0.521	0.203	0.152	-0.029	-0.152
30.0	-10.01	1.177	0.900	0.507	0.174	-0.091	-0.174	-0.061
20.0	-9.57	1.484	1.129	0.831	0.304	0.045	-0.217	-0.045
10.0	-7.81	1.855	1.300	0.986	0.377	-0.167	-0.565	-0.061
5.0	-5.93	1.629	1.271	1.310	0.652	-0.015	-0.739	-0.545
2.5	-4.36	1.113	1.000	1.225	0.826	0.000	-0.884	-1.000

QUADRANT I +10m/s +400rpm File: Qpp4p3.dat Span is : 0.83 m No: 6

Incidence		-30	-20	-10	0	10	20	30
%c	%t/c							
0.0	0.00	-1.258	-3.030	-1.016	0.288	0.716	0.281	-0.406
2.5	4.36	-1.258	-3.343	-2.031	-0.712	0.045	0.563	0.870
5.0	5.93	-0.530	-2.328	-1.500	-0.562	0.030	0.422	0.826
10.0	7.81	-0.273	-1.343	-0.859	-0.384	0.075	0.422	0.710
20.0	9.57	-0.091	-0.507	-0.203	0.082	0.269	0.531	0.696
30.0	10.01	-0.015	-0.090	0.109	0.288	0.373	0.703	0.652
40.0	9.68	0.061	0.164	0.266	0.493	0.552	0.688	0.681
50.0	8.83	-0.045	0.313	0.391	0.521	0.687	0.609	0.609
60.0	7.61	-0.167	0.194	0.328	0.479	0.507	0.531	0.449
70.0	6.11	-0.273	-0.045	0.266	0.192	0.209	0.125	0.174
80.0	4.37	-0.515	-0.224	0.016	0.137	0.119	0.047	-0.116
90.0	2.41	-0.576	-0.149	0.078	0.110	0.119	0.016	-0.232

95.0	1.35	-0.455	-0.075	0.078	0.205	0.119	0.000	-0.217
95.0	-1.35	-0.167	0.030	0.156	0.192	0.224	0.031	-0.536
90.0	-2.41	0.015	0.104	0.141	0.192	0.209	-0.047	-0.478
80.0	-4.37	0.212	0.149	0.250	0.301	0.239	-0.063	-0.406
70.0	-6.11	0.348	0.284	0.328	0.260	0.179	-0.047	-0.435
60.0	-7.61	0.591	0.343	0.406	0.356	0.179	-0.063	-0.435
50.0	-8.83	0.727	0.567	0.500	0.342	0.254	0.063	-0.304
40.0	-9.68	0.970	0.701	0.531	0.452	0.269	0.000	-0.058
30.0	-10.01	1.061	0.970	0.672	0.397	0.134	-0.063	0.029
20.0	-9.57	1.364	1.224	0.906	0.562	0.224	-0.172	0.145
10.0	-7.81	1.500	1.388	1.219	0.589	0.179	-0.563	-0.333
5.0	-5.93	0.909	0.851	0.781	0.479	0.761	0.375	0.623
2.5	-4.36	1.121	0.985	1.234	0.945	0.313	-0.813	-1.203

QUADRANT I +10m/s +400rpm File: Qpp4p3.dat Span is : 0.94 m No: 7

Incidence		-30	-20	-10	0	10	20	30
%c	%t/c							
0.0	0.00	-0.188	-0.279	-0.167	-0.060	-0.045	-0.123	-0.224
2.5	4.36	-0.971	-2.574	-1.606	-0.731	-0.015	0.385	0.552
5.0	5.93	-0.913	-2.029	-1.439	-0.746	-0.194	0.200	0.433
10.0	7.81	-0.768	-1.397	-1.121	-0.716	-0.299	-0.015	0.209
20.0	9.57	-0.812	-1.088	-0.894	-0.582	-0.299	-0.185	0.015
30.0	10.01	-0.768	-0.868	-0.712	-0.463	-0.269	-0.185	-0.075
40.0	9.68	-0.478	-0.456	-0.379	-0.284	-0.179	-0.169	-0.090
50.0	8.83	-0.797	-0.706	-0.470	-0.343	-0.209	-0.138	-0.119
60.0	7.61	-0.696	-0.765	-0.439	-0.299	-0.179	-0.215	-0.194
70.0	6.11	-0.681	-0.750	-0.333	-0.224	-0.134	-0.169	-0.239
80.0	4.37	-0.696	-0.676	-0.288	-0.134	-0.075	-0.154	-0.284
90.0	2.41	-0.710	-0.574	-0.242	-0.060	-0.015	-0.154	-0.343
95.0	1.35	-0.696	-0.500	-0.182	-0.030	-0.030	-0.123	-0.328
95.0	-1.35	-0.333	-0.176	-0.076	-0.015	-0.119	-0.308	-0.612
90.0	-2.41	-0.304	-0.147	-0.106	-0.090	-0.194	-0.415	-0.761
80.0	-4.37	-0.159	-0.103	-0.106	-0.134	-0.299	-0.615	-0.821
70.0	-6.11	-0.116	-0.103	-0.152	-0.149	-0.343	-0.692	-0.866
60.0	-7.61	-0.101	-0.103	-0.136	-0.179	-0.373	-0.800	-0.806
50.0	-8.83	-0.014	-0.059	-0.152	-0.194	-0.388	-0.754	-0.731
40.0	-9.68	0.072	0.000	-0.167	-0.239	-0.433	-0.769	-0.657
30.0	-10.01	0.174	0.044	-0.167	-0.343	-0.552	-0.846	-0.672
20.0	-9.57	0.333	0.206	-0.015	-0.269	-0.522	-0.785	-0.731
10.0	-7.81	0.594	0.515	0.242	-0.134	-0.597	-1.015	-1.090
5.0	-5.93	0.681	0.691	0.500	0.075	-0.522	-1.200	-1.552
2.5	-4.36	0.565	0.618	0.636	0.254	-0.463	-1.415	-1.776

QUADRANT I +10m/s +400rpm File: Qpp4p3.dat Span is : 0.97 m No: 8

Incidence		-30	-20	-10	0	10	20	30
%c	%t/c							
0.0	0.00	-0.212	-0.246	-0.087	-0.058	-0.074	-0.090	-0.212
2.5	4.36	-1.848	-2.116	-1.232	-0.580	0.015	0.358	0.470
5.0	5.93	-0.894	-1.739	-1.159	-0.652	-0.162	0.179	0.333
10.0	7.81	-0.879	-1.362	-0.971	-0.638	-0.324	-0.015	0.076
20.0	9.57	-0.803	-1.116	-0.812	-0.536	-0.324	-0.119	-0.091
30.0	10.01	-0.818	-1.159	-0.696	-0.449	-0.309	-0.164	-0.152
40.0	9.68	-0.758	-0.884	-0.493	-0.304	-0.221	-0.134	-0.182
50.0	8.83	-0.773	-1.087	-0.609	-0.319	-0.235	-0.164	-0.197

60.0	7.61	-0.682	-0.942	-0.507	-0.261	-0.206	-0.179	-0.273
70.0	6.11	-0.712	-0.783	-0.406	-0.217	-0.191	-0.179	-0.288
80.0	4.37	-0.712	-0.725	-0.362	-0.203	-0.147	-0.119	-0.303
90.0	2.41	-0.667	-0.565	-0.275	-0.116	-0.103	-0.119	-0.318
95.0	1.35	-0.727	-0.478	-0.217	-0.058	-0.103	-0.119	-0.379
95.0	-1.35	-0.409	-0.174	-0.072	-0.029	-0.132	-0.299	-0.712
90.0	-2.41	-0.318	-0.174	-0.087	-0.058	-0.191	-0.433	-0.818
80.0	-4.37	-0.288	-0.174	-0.130	-0.101	-0.324	-0.507	-0.909
70.0	-6.11	-0.212	-0.174	-0.145	-0.159	-0.412	-0.597	-0.894
60.0	-7.61	-0.152	-0.174	-0.174	-0.174	-0.485	-0.672	-0.803
50.0	-8.83	-0.076	-0.130	-0.188	-0.188	-0.515	-0.791	-0.818
40.0	-9.68	-0.015	-0.087	-0.188	-0.203	-0.515	-0.881	-0.773
30.0	-10.01	0.091	-0.043	-0.188	-0.290	-0.574	-0.851	-0.864
20.0	-9.57	0.258	0.116	-0.087	-0.232	-0.515	-0.716	-0.803
10.0	-7.81	0.485	0.391	0.116	-0.203	-0.603	-0.955	-1.030
5.0	-5.93	0.621	0.609	0.391	0.014	-0.559	-1.075	-1.485
2.5	-4.36	0.561	0.623	0.536	0.217	-0.456	-1.149	-1.697

QUADRANT II +10m/s -400rpm File: Qpm4p3.dat Span is : 0.07 m No: 1

Incidence		-30	-20	-10	0	10	20	30
%c	%t/c							
0.0	0.00	-1.152	0.388	0.862	1.045	0.657	-0.279	-1.923
2.5	4.36	-2.955	-2.045	-1.415	-0.209	0.478	1.000	1.185
5.0	5.93	-2.273	-2.075	-1.462	-0.761	0.000	0.618	1.062
10.0	7.81	-1.470	-1.672	-1.569	-0.970	-0.403	0.132	0.662
20.0	9.57	-1.076	-1.194	-1.462	-1.045	-0.642	-0.250	0.200
30.0	10.01	-0.864	-0.985	-1.262	-0.970	-0.716	-0.368	-0.062
40.0	9.68	-0.727	-0.806	-1.015	-0.821	-0.776	-0.456	-0.138
50.0	8.83	-0.621	-0.582	-0.785	-0.821	-0.701	-0.456	-0.200
60.0	7.61	-0.591	-0.657	-0.800	-0.746	-0.701	-0.500	-0.292
70.0	6.11	-0.545	-0.552	-0.615	-0.627	-0.582	-0.485	-0.323
80.0	4.37	-0.591	-0.552	-0.554	-0.537	-0.552	-0.485	-0.338
90.0	2.41	-0.576	-0.567	-0.462	-0.418	-0.478	-0.456	-0.415
95.0	1.35	-0.652	-0.478	-0.415	-0.373	-0.448	-0.485	-0.477
95.0	-1.35	-0.409	-0.433	-0.446	-0.313	-0.403	-0.515	-0.615
90.0	-2.41	-0.409	-0.493	-0.492	-0.448	-0.507	-0.500	-0.569
80.0	-4.37	-0.333	-0.537	-0.585	-0.582	-0.552	-0.588	-0.585
70.0	-6.11	-0.348	-0.552	-0.692	-0.627	-0.582	-0.559	-0.646
60.0	-7.61	-0.394	-0.657	-0.800	-0.746	-0.716	-0.706	-0.754
50.0	-8.83	-0.318	-0.716	-0.892	-0.806	-0.806	-0.750	-0.877
40.0	-9.68	-0.288	-0.701	-1.000	-1.090	-1.015	-0.971	-0.985
30.0	-10.01	-0.197	-0.642	-0.954	-1.194	-1.104	-1.015	-1.077
20.0	-9.57	-0.061	-0.746	-1.092	-1.104	-1.470	-1.353	-1.369
10.0	-7.81	0.242	-0.373	-1.554	-1.522	-1.836	-1.985	-1.538
5.0	-5.93	0.788	0.164	-0.615	-1.224	-2.134	-2.647	-2.892
2.5	-4.36	1.167	0.672	0.277	-0.507	-1.657	-2.500	-3.492

QUADRANT II +10m/s -400rpm File: Qpm4p3.dat Span is : 0.23 m No: 2

Incidence		-30	-20	-10	0	10	20	30
%c	%t/c							
0.0	0.00	-0.443	-0.551	-0.725	-1.246	-1.059	-1.479	-2.551
2.5	4.36	-0.943	-1.174	-0.681	-0.565	-0.618	-0.211	-0.101
5.0	5.93	-0.786	-0.797	-0.667	-0.638	-0.559	-0.169	0.188
10.0	7.81	-1.229	-1.159	-1.116	-0.493	-0.294	-0.239	0.000

20.0	9.57	-1.014	-0.855	-0.928	-0.841	-0.412	-0.254	-0.058
30.0	10.01	-0.700	-0.870	-0.899	-0.870	-0.412	-0.380	0.014
40.0	9.68	-0.629	-0.638	-0.797	-0.754	-0.559	-0.268	-0.058
50.0	8.83	-0.600	-0.594	-0.754	-0.623	-0.544	-0.310	-0.043
60.0	7.61	-0.543	-0.565	-0.638	-0.594	-0.544	-0.324	-0.058
70.0	6.11	-0.571	-0.652	-0.594	-0.565	-0.456	-0.282	-0.087
80.0	4.37	-0.571	-0.565	-0.522	-0.435	-0.397	-0.310	-0.188
90.0	2.41	-0.600	-0.522	-0.507	-0.362	-0.441	-0.296	-0.261
95.0	1.35	-0.557	-0.594	-0.435	-0.435	-0.441	-0.366	-0.333
95.0	-1.35	-0.343	-0.449	-0.449	-0.391	-0.471	-0.507	-0.638
90.0	-2.41	-0.314	-0.478	-0.507	-0.536	-0.574	-0.465	-0.522
80.0	-4.37	-0.243	-0.522	-0.507	-0.551	-0.618	-0.493	-0.580
70.0	-6.11	-0.200	-0.507	-0.580	-0.507	-0.618	-0.549	-0.536
60.0	-7.61	-0.286	-0.594	-0.652	-0.681	-0.662	-0.549	-0.594
50.0	-8.83	-0.314	-0.667	-0.725	-0.754	-0.735	-0.620	-0.681
40.0	-9.68	-0.357	-0.652	-0.826	-0.768	-0.662	-0.690	-0.739
30.0	-10.01	-0.686	-0.797	-0.841	-0.913	-1.132	-1.070	-0.638
20.0	-9.57	-0.557	-1.014	-0.783	-0.971	-0.897	-0.620	-0.812
10.0	-7.81	-0.671	-0.710	-0.710	-0.754	-1.059	-1.338	-1.449
5.0	-5.93	-0.529	-1.203	-1.014	-1.174	-1.632	-1.648	-1.986
2.5	-4.36	-1.286	-1.652	-0.101	-0.319	-1.515	-1.042	-2.072

QUADRANT II +10m/s -400rpm File: Qpm4p3.dat Span is : 0.40 m No: 3

Incidence		-30	-20	-10	0	10	20	30
%c	%t/c							
0.0	0.00	-0.788	-1.015	-0.742	-0.955	-1.258	-1.015	-1.385
2.5	4.36	-0.803	-0.939	-1.106	-0.848	-0.530	-0.515	-0.662
5.0	5.93	-0.773	-0.879	-1.045	-0.864	-0.439	-0.576	-0.262
10.0	7.81	-0.758	-0.985	-1.076	-0.848	-0.621	-0.561	-0.585
20.0	9.57	-0.758	-0.788	-1.030	-1.015	-0.667	-0.773	-0.738
30.0	10.01	-0.682	-0.727	-0.894	-0.758	-0.682	-0.697	-0.646
40.0	9.68	-0.742	-0.758	-0.788	-0.712	-0.697	-0.667	-0.646
50.0	8.83	-0.712	-0.697	-0.758	-0.712	-0.652	-0.545	-0.492
60.0	7.61	-0.652	-0.697	-0.621	-0.591	-0.576	-0.530	-0.400
70.0	6.11	-0.636	-0.636	-0.591	-0.606	-0.561	-0.439	-0.292
80.0	4.37	-0.606	-0.591	-0.591	-0.515	-0.455	-0.424	-0.215
90.0	2.41	-0.561	-0.545	-0.530	-0.470	-0.455	-0.439	-0.231
95.0	1.35	-0.545	-0.530	-0.500	-0.470	-0.455	-0.439	-0.323
95.0	-1.35	-0.424	-0.500	-0.530	-0.485	-0.500	-0.545	-0.585
90.0	-2.41	-0.424	-0.530	-0.530	-0.500	-0.561	-0.500	-0.585
80.0	-4.37	-0.424	-0.530	-0.530	-0.606	-0.561	-0.606	-0.615
70.0	-6.11	-0.515	-0.576	-0.591	-0.621	-0.591	-0.606	-0.615
60.0	-7.61	-0.561	-0.636	-0.621	-0.606	-0.591	-0.606	-0.646
50.0	-8.83	-0.606	-0.667	-0.712	-0.652	-0.591	-0.621	-0.662
40.0	-9.68	-0.652	-0.758	-0.742	-0.621	-0.621	-0.636	-0.692
30.0	-10.01	-0.758	-0.773	-0.742	-0.667	-0.682	-0.652	-0.662
20.0	-9.57	-0.803	-0.818	-0.833	-0.879	-0.788	-0.712	-0.692
10.0	-7.81	-0.773	-0.864	-0.955	-0.909	-0.826	-0.758	-0.800
5.0	-5.93	-0.879	-0.955	-1.030	-0.909	-0.864	-0.818	-0.923
2.5	-4.36	-0.636	-0.970	-1.015	-1.121	-1.030	-0.924	-1.015

QUADRANT II +10m/s -400rpm File: Qpm4p3.dat Span is : 0.53 m No: 4

Incidence		-30	-20	-10	0	10	20	30
%c	%t/c							
0.0	0.00	-0.826	-0.904	-1.110	-0.985	-0.949	-0.853	-0.896
2.5	4.36	-0.855	-0.941	-1.074	-0.985	-0.794	-0.882	-0.731
5.0	5.93	-0.812	-0.838	-1.162	-0.909	-0.779	-0.809	-0.836
10.0	7.81	-0.681	-1.000	-1.088	-0.773	-0.824	-0.809	-0.851
20.0	9.57	-0.609	-0.618	-0.926	-0.970	-0.824	-0.765	-0.925
30.0	10.01	-0.696	-0.794	-0.912	-0.864	-0.603	-0.765	-0.866
40.0	9.68	-0.696	-0.721	-0.809	-0.879	-0.706	-0.779	-0.821
50.0	8.83	-0.652	-0.750	-0.765	-0.652	-0.691	-0.750	-0.612
60.0	7.61	-0.623	-0.647	-0.691	-0.667	-0.603	-0.588	-0.537
70.0	6.11	-0.580	-0.618	-0.574	-0.576	-0.485	-0.485	-0.433
80.0	4.37	-0.609	-0.632	-0.529	-0.485	-0.426	-0.544	-0.493
90.0	2.41	-0.493	-0.603	-0.544	-0.530	-0.426	-0.382	-0.299
95.0	1.35	-0.536	-0.485	-0.471	-0.500	-0.456	-0.397	-0.373
95.0	-1.35	-0.449	-0.515	-0.456	-0.439	-0.515	-0.559	-0.567
90.0	-2.41	-0.435	-0.529	-0.471	-0.485	-0.559	-0.529	-0.582
80.0	-4.37	-0.406	-0.500	-0.471	-0.470	-0.441	-0.559	-0.582
70.0	-6.11	-0.536	-0.544	-0.544	-0.515	-0.559	-0.544	-0.627
60.0	-7.61	-0.449	-0.515	-0.544	-0.485	-0.529	-0.559	-0.657
50.0	-8.83	-0.565	-0.588	-0.574	-0.500	-0.559	-0.544	-0.627
40.0	-9.68	-0.623	-0.632	-0.706	-0.606	-0.603	-0.574	-0.657
30.0	-10.01	-0.681	-0.647	-0.706	-0.652	-0.603	-0.588	-0.642
20.0	-9.57	-0.638	-0.706	-0.779	-0.803	-0.676	-0.721	-0.672
10.0	-7.81	-0.681	-0.853	-0.926	-0.939	-0.809	-0.721	-0.791
5.0	-5.93	-0.681	-0.824	-1.044	-0.970	-0.868	-0.809	-0.776
2.5	-4.36	-0.797	-0.868	-1.147	-0.985	-1.103	-0.824	-1.060

QUADRANT II +10m/s -400rpm File: Qpm4p3.dat Span is : 0.70 m No: 5

Incidence		-30	-20	-10	0	10	20	30
%c	%t/c							
0.0	0.00	-0.939	-0.859	-0.740	-0.735	-0.681	-0.576	-0.478
2.5	4.36	-0.515	-0.844	-0.534	-0.721	-0.696	-0.758	-0.478
5.0	5.93	-0.379	-0.609	-0.411	-0.618	-0.623	-0.439	-0.464
10.0	7.81	-0.182	-0.578	-0.384	-0.309	-0.377	-0.364	-0.420
20.0	9.57	-0.121	-0.109	-0.260	-0.221	-0.072	-0.106	-0.217
30.0	10.01	0.061	-0.031	-0.068	0.250	0.029	0.030	0.014
40.0	9.68	0.212	0.094	0.041	0.338	0.174	0.197	0.130
50.0	8.83	0.152	0.156	0.068	0.279	0.362	0.121	0.159
60.0	7.61	0.015	0.047	0.082	0.162	0.174	0.061	0.145
70.0	6.11	-0.167	-0.313	-0.137	-0.221	-0.159	-0.106	-0.130
80.0	4.37	-0.424	-0.438	-0.274	-0.294	-0.304	-0.348	-0.348
90.0	2.41	-0.409	-0.422	-0.397	-0.338	-0.377	-0.333	-0.290
95.0	1.35	-0.455	-0.469	-0.356	-0.279	-0.319	-0.424	-0.304
95.0	-1.35	-0.182	-0.266	-0.247	-0.279	-0.304	-0.318	-0.362
90.0	-2.41	-0.061	-0.328	-0.151	-0.191	-0.217	-0.348	-0.290
80.0	-4.37	-0.030	-0.219	0.014	-0.162	-0.159	-0.197	-0.159
70.0	-6.11	0.091	-0.172	0.027	0.000	-0.246	-0.182	-0.203
60.0	-7.61	0.136	0.000	0.082	0.074	-0.130	0.000	-0.203
50.0	-8.83	0.258	0.031	0.055	0.147	0.000	0.030	-0.029
40.0	-9.68	0.197	0.141	0.247	0.191	0.036	0.045	0.101
30.0	-10.01	0.197	0.219	0.192	0.235	0.072	0.076	0.174
20.0	-9.57	0.364	0.234	0.260	0.147	0.203	0.030	0.174

10.0	-7.81	0.318	0.078	0.260	0.044	0.043	0.000	0.058
5.0	-5.93	0.076	-0.203	0.014	0.029	-0.043	-0.167	-0.130
2.5	-4.36	-0.227	-0.188	-0.342	-0.015	-0.232	-0.303	-0.319

QUADRANT II +10m/s -400rpm File: Qpm4p3.dat Span is : 0.83 m No: 6

Incidence		-30	-20	-10	0	10	20	30
%c	%t/c							
0.0	0.00	-0.884	-0.767	-0.821	-0.758	-0.576	-0.750	-0.657
2.5	4.36	-0.594	-0.589	-0.821	-0.788	-0.879	-0.645	-0.586
5.0	5.93	-0.478	-0.616	-0.403	-0.758	-0.682	-0.618	-0.443
10.0	7.81	-0.377	-0.329	-0.343	-0.424	-0.439	-0.395	-0.443
20.0	9.57	-0.203	-0.110	-0.254	-0.303	-0.258	-0.158	-0.229
30.0	10.01	0.000	-0.219	-0.075	-0.182	-0.045	0.118	-0.029
40.0	9.68	0.043	0.055	0.000	0.121	0.106	0.237	0.114
50.0	8.83	0.029	-0.014	0.030	0.106	0.288	0.289	0.214
60.0	7.61	-0.072	-0.068	-0.075	0.030	0.167	0.118	0.143
70.0	6.11	-0.203	-0.274	-0.254	-0.318	-0.167	-0.079	0.029
80.0	4.37	-0.493	-0.384	-0.433	-0.439	-0.379	-0.237	-0.143
90.0	2.41	-0.507	-0.562	-0.478	-0.409	-0.379	-0.184	-0.314
95.0	1.35	-0.522	-0.479	-0.388	-0.515	-0.364	-0.171	-0.257
95.0	-1.35	-0.261	-0.315	-0.179	-0.333	-0.318	-0.263	-0.314
90.0	-2.41	-0.232	-0.178	-0.134	-0.303	-0.212	-0.158	-0.214
80.0	-4.37	-0.101	-0.123	-0.030	-0.152	-0.152	-0.118	-0.114
70.0	-6.11	0.000	-0.055	0.030	-0.152	-0.152	-0.092	-0.186
60.0	-7.61	0.058	-0.014	0.045	-0.045	-0.136	-0.013	-0.057
50.0	-8.83	0.116	0.123	0.119	0.106	0.061	0.132	0.057
40.0	-9.68	0.217	0.247	0.179	0.212	0.167	0.092	0.086
30.0	-10.01	0.261	0.192	0.149	0.273	-0.015	0.224	0.071
20.0	-9.57	0.101	0.329	0.015	0.030	0.197	0.132	0.114
10.0	-7.81	0.304	0.315	-0.119	-0.227	0.242	0.013	0.143
5.0	-5.93	0.333	0.562	0.507	6142.985	0.652	0.368	0.371
2.5	-4.36	-0.348	-0.411	-0.388	-0.591	-0.152	-0.197	-0.229

QUADRANT II +10m/s -400rpm File: Qpm4p3.dat Span is : 0.94 m No: 7

Incidence		-30	-20	-10	0	10	20	30
%c	%t/c							
0.0	0.00	-0.279	-0.343	-0.373	-0.418	-0.382	-0.328	-0.318
2.5	4.36	-0.809	-0.851	-1.000	-0.851	-0.926	-0.955	-0.970
5.0	5.93	-0.824	-0.731	-0.955	-0.896	-0.868	-0.896	-0.833
10.0	7.81	-0.721	-0.806	-0.940	-0.776	-0.824	-0.731	-0.788
20.0	9.57	-0.750	-0.761	-0.955	-0.940	-0.618	-0.701	-0.682
30.0	10.01	-0.750	-0.836	-0.910	-0.582	-0.618	-0.582	-0.591
40.0	9.68	-0.574	-0.478	-0.612	-0.493	-0.500	-0.448	-0.379
50.0	8.83	-0.706	-0.776	-0.761	-0.478	-0.588	-0.507	-0.485
60.0	7.61	-0.721	-0.761	-0.701	-0.731	-0.588	-0.433	-0.470
70.0	6.11	-0.721	-0.657	-0.701	-0.552	-0.574	-0.418	-0.439
80.0	4.37	-0.647	-0.672	-0.687	-0.537	-0.500	-0.433	-0.485
90.0	2.41	-0.735	-0.731	-0.701	-0.642	-0.529	-0.433	-0.455
95.0	1.35	-0.721	-0.701	-0.627	-0.582	-0.515	-0.433	-0.530
95.0	-1.35	-0.426	-0.537	-0.433	-0.418	-0.500	-0.537	-0.712
90.0	-2.41	-0.338	-0.552	-0.448	-0.448	-0.588	-0.642	-0.667
80.0	-4.37	-0.412	-0.463	-0.403	-0.463	-0.574	-0.672	-0.636
70.0	-6.11	-0.353	-0.493	-0.478	-0.478	-0.515	-0.507	-0.636
60.0	-7.61	-0.426	-0.463	-0.478	-0.507	-0.515	-0.597	-0.682

50.0	-8.83	-0.412	-0.478	-0.478	-0.507	-0.544	-0.552	-0.636
40.0	-9.68	-0.485	-0.507	-0.478	-0.582	-0.559	-0.597	-0.652
30.0	-10.01	-0.471	-0.478	-0.552	-0.612	-0.603	-0.522	-0.652
20.0	-9.57	-0.500	-0.478	-0.612	-0.597	-0.691	-0.567	-0.621
10.0	-7.81	-0.603	-0.597	-0.642	-0.522	-0.676	-0.522	-0.606
5.0	-5.93	-0.706	-0.657	-0.940	-0.746	-0.662	-0.642	-0.606
2.5	-4.36	-0.765	-0.925	-1.030	-0.955	-0.662	-0.627	-0.682

QUADRANT II +10m/s -400rpm File: Qpm4p3.dat Span is : 0.97 m No: 8

Incidence		-30	-20	-10	0	10	20	30
%c	%t/c							
0.0	0.00	-0.299	-0.319	-0.400	-0.403	-0.348	-0.366	-0.338
2.5	4.36	-0.866	-0.928	-1.014	-0.925	-0.942	-0.930	-0.941
5.0	5.93	-0.791	-1.014	-1.014	-0.896	-0.826	-0.831	-0.897
10.0	7.81	-0.746	-0.899	-1.014	-0.776	-0.841	-1.042	-0.926
20.0	9.57	-0.731	-0.623	-0.843	-0.985	-0.652	-0.718	-0.809
30.0	10.01	-0.672	-0.783	-0.857	-0.866	-0.580	-0.803	-0.588
40.0	9.68	-0.642	-0.623	-0.629	-0.642	-0.493	-0.507	-0.529
50.0	8.83	-0.701	-0.725	-0.786	-0.701	-0.594	-0.521	-0.529
60.0	7.61	-0.672	-0.667	-0.657	-0.746	-0.449	-0.620	-0.618
70.0	6.11	-0.597	-0.594	-0.686	-0.746	-0.522	-0.366	-0.324
80.0	4.37	-0.731	-0.710	-0.557	-0.567	-0.493	-0.493	-0.441
90.0	2.41	-0.761	-0.580	-0.629	-0.552	-0.609	-0.465	-0.500
95.0	1.35	-0.746	-0.696	-0.600	-0.701	-0.478	-0.451	-0.529
95.0	-1.35	-0.433	-0.449	-0.457	-0.418	-0.464	-0.451	-0.676
90.0	-2.41	-0.358	-0.493	-0.443	-0.463	-0.594	-0.563	-0.588
80.0	-4.37	-0.328	-0.507	-0.443	-0.448	-0.420	-0.563	-0.603
70.0	-6.11	-0.418	-0.449	-0.400	-0.507	-0.522	-0.479	-0.691
60.0	-7.61	-0.358	-0.507	-0.471	-0.552	-0.478	-0.493	-0.676
50.0	-8.83	-0.448	-0.536	-0.471	-0.463	-0.478	-0.549	-0.574
40.0	-9.68	-0.478	-0.449	-0.500	-0.582	-0.493	-0.521	-0.618
30.0	-10.01	-0.463	-0.551	-0.471	-0.642	-0.623	-0.577	-0.676
20.0	-9.57	-0.657	-0.652	-0.757	-0.552	-0.696	-0.634	-0.676
10.0	-7.81	-0.597	-0.391	-0.686	-0.716	-0.507	-0.535	-0.588
5.0	-5.93	-0.731	-0.667	-1.014	-0.612	-0.768	-0.704	-0.647
2.5	-4.36	-0.851	-0.580	-0.929	-1.015	-0.609	-0.761	-0.574

QUADRANT II +10m/s -800rpm File: Qpm8p3.dat Span is : 0.07 m No: 1

Incidence		-30	-20	-10	0	10	20	30
%c	%t/c							
0.0	0.00	-0.179	0.591	1.047	0.531	-0.415	-1.194	-2.313
2.5	4.36	-3.224	-2.652	-1.656	-0.578	0.200	0.642	1.015
5.0	5.93	-2.672	-2.500	-2.156	-1.375	-0.446	0.209	0.806
10.0	7.81	-1.821	-2.227	-2.438	-2.078	-1.123	-0.582	0.194
20.0	9.57	-0.970	-1.364	-1.922	-1.828	-1.600	-1.030	-0.463
30.0	10.01	-0.746	-0.848	-1.641	-1.766	-1.569	-1.119	-0.657
40.0	9.68	-0.746	-0.803	-1.375	-1.578	-1.415	-1.164	-0.552
50.0	8.83	-0.731	-0.742	-0.938	-1.203	-1.246	-0.896	-0.761
60.0	7.61	-0.627	-0.545	-0.578	-1.094	-1.123	-0.955	-0.642
70.0	6.11	-0.627	-0.561	-0.688	-0.813	-0.923	-0.806	-0.597
80.0	4.37	-0.537	-0.591	-0.641	-0.797	-0.754	-0.791	-0.597
90.0	2.41	-0.552	-0.545	-0.547	-0.750	-0.708	-0.612	-0.582
95.0	1.35	-0.493	-0.500	-0.656	-0.703	-0.662	-0.582	-0.612
95.0	-1.35	-0.493	-0.682	-0.969	-0.813	-0.738	-0.552	-0.552

90.0	-2.41	-0.597	-0.833	-0.875	-0.719	-0.631	-0.522	-0.552
80.0	-4.37	-0.642	-0.818	-0.891	-0.781	-0.631	-0.552	-0.612
70.0	-6.11	-0.746	-0.894	-0.875	-0.781	-0.646	-0.642	-0.642
60.0	-7.61	-0.970	-1.030	-1.016	-0.813	-0.646	-0.627	-0.701
50.0	-8.83	-1.254	-1.288	-1.031	-0.828	-0.754	-0.642	-0.731
40.0	-9.68	-1.448	-1.409	-1.125	-0.875	-0.723	-0.627	-0.731
30.0	-10.01	-1.537	-1.591	-1.234	-0.875	-0.785	-0.701	-0.746
20.0	-9.57	-1.672	-2.621	-1.938	-0.750	-1.015	-0.567	-0.746
10.0	-7.81	-1.627	-2.106	-2.547	-2.531	-2.062	-1.851	-0.418
5.0	-5.93	-0.731	-1.864	-2.813	-3.141	-3.154	-2.612	-2.209
2.5	-4.36	0.537	-1.773	-1.875	-2.688	-2.677	-2.657	-2.567

QUADRANT II +10m/s -800rpm File: Qpm8p3.dat Span is : 0.23 m No: 2

Incidence		-30	-20	-10	0	10	20	30
%c	%t/c							
0.0	0.00	-2.038	-2.189	-2.722	-2.955	-2.635	-2.627	-2.736
2.5	4.36	-1.808	-2.081	-2.083	-2.254	-2.122	-1.893	-1.778
5.0	5.93	-1.731	-1.784	-2.111	-2.030	-1.973	-1.933	-1.722
10.0	7.81	-1.436	-1.757	-1.958	-1.925	-1.851	-1.840	-1.681
20.0	9.57	-1.244	-1.324	-1.569	-1.791	-1.797	-1.520	-1.569
30.0	10.01	-0.923	-1.041	-1.194	-1.448	-1.446	-1.413	-1.194
40.0	9.68	-0.795	-0.973	-1.097	-1.269	-1.203	-1.120	-0.875
50.0	8.83	-0.692	-0.784	-0.931	-1.015	-1.027	-0.880	-0.653
60.0	7.61	-0.577	-0.622	-0.639	-0.896	-0.703	-0.667	-0.542
70.0	6.11	-0.603	-0.622	-0.722	-0.821	-0.689	-0.573	-0.292
80.0	4.37	-0.564	-0.595	-0.556	-0.701	-0.568	-0.493	-0.278
90.0	2.41	-0.500	-0.581	-0.500	-0.597	-0.554	-0.493	-0.389
95.0	1.35	-0.500	-0.541	-0.569	-0.701	-0.622	-0.520	-0.444
95.0	-1.35	-0.513	-0.622	-0.917	-0.806	-0.716	-0.680	-0.694
90.0	-2.41	-0.513	-0.730	-0.722	-0.776	-0.703	-0.693	-0.750
80.0	-4.37	-0.667	-0.946	-0.806	-0.806	-0.676	-0.667	-0.694
70.0	-6.11	-0.923	-1.135	-0.986	-0.896	-0.676	-0.640	-0.722
60.0	-7.61	-1.231	-1.514	-1.569	-0.896	-0.770	-0.747	-0.764
50.0	-8.83	-1.487	-1.608	-1.472	-0.896	-0.878	-0.747	-0.750
40.0	-9.68	-1.846	-1.878	-1.764	-1.254	-1.162	-0.867	-0.875
30.0	-10.01	-2.282	-2.203	-1.917	-1.776	-1.392	-1.067	-0.750
20.0	-9.57	-2.295	-2.311	-2.167	-2.149	-1.892	-1.707	-1.486
10.0	-7.81	-2.000	-2.568	-2.514	-1.567	-1.919	-1.427	-1.889
5.0	-5.93	-2.256	-2.378	-2.361	-2.657	-2.257	-2.253	-2.181
2.5	-4.36	-2.154	-1.932	-2.389	-2.478	-1.730	-2.147	-2.028

QUADRANT II +10m/s -800rpm File: Qpm8p3.dat Span is : 0.40 m No: 3

Incidence		-30	-20	-10	0	10	20	30
%c	%t/c							
0.0	0.00	-2.538	-2.308	-2.292	-2.333	-2.333	-2.409	-1.970
2.5	4.36	-2.477	-2.308	-2.415	-2.288	-2.303	-2.227	-2.121
5.0	5.93	-2.292	-2.246	-2.369	-2.439	-2.242	-2.242	-2.273
10.0	7.81	-1.885	-2.108	-2.046	-2.136	-2.273	-2.152	-2.242
20.0	9.57	-1.477	-1.769	-1.800	-1.864	-1.939	-2.061	-2.045
30.0	10.01	-1.323	-1.323	-1.462	-1.515	-1.712	-1.788	-1.727
40.0	9.68	-1.077	-1.185	-1.354	-1.348	-1.333	-1.455	-1.530
50.0	8.83	-0.877	-1.015	-1.092	-1.121	-1.030	-1.167	-1.273
60.0	7.61	-0.800	-0.754	-0.954	-0.924	-0.833	-0.939	-0.909
70.0	6.11	-0.708	-0.769	-0.831	-0.879	-0.652	-0.591	-0.606

80.0	4.37	-0.692	-0.646	-0.677	-0.636	-0.470	-0.455	-0.242
90.0	2.41	-0.631	-0.631	-0.646	-0.598	-0.500	-0.409	-0.242
95.0	1.35	-0.615	-0.600	-0.662	-0.561	-0.545	-0.348	-0.318
95.0	-1.35	-0.431	-0.615	-0.800	-0.803	-0.818	-0.803	-0.742
90.0	-2.41	-0.477	-0.615	-0.738	-0.833	-0.803	-0.788	-0.727
80.0	-4.37	-0.569	-0.800	-0.938	-0.848	-0.712	-0.697	-0.712
70.0	-6.11	-0.954	-1.108	-1.000	-0.894	-0.758	-0.697	-0.712
60.0	-7.61	-1.246	-1.354	-1.215	-0.864	-0.652	-0.697	-0.773
50.0	-8.83	-1.723	-1.754	-1.569	-1.091	-0.894	-0.758	-0.773
40.0	-9.68	-2.200	-1.846	-1.754	-1.333	-1.076	-0.909	-0.864
30.0	-10.01	-2.477	-2.062	-2.138	-1.773	-1.500	-1.212	-1.061
20.0	-9.57	-2.446	-2.492	-2.262	-2.106	-1.970	-1.682	-1.455
10.0	-7.81	-2.523	-2.554	-2.262	-2.303	-2.212	-2.000	-1.788
5.0	-5.93	-2.415	-2.262	-2.338	-2.364	-2.318	-2.348	-1.985
2.5	-4.36	-2.308	-2.215	-2.323	-2.212	-2.227	-2.167	-2.091

QUADRANT II +10m/s -800rpm File: Qpm8p3.dat Span is : 0.53 m No: 4

Incidence		-30	-20	-10	0	10	20	30
%c	%t/c							
0.0	0.00	-1.884	-1.709	-1.803	-1.963	-1.877	-1.856	-1.882
2.5	4.36	-2.082	-1.703	-1.831	-2.000	-1.904	-1.849	-1.903
5.0	5.93	-1.890	-1.919	-1.958	-2.075	-1.945	-1.795	-1.722
10.0	7.81	-1.904	-1.838	-1.986	-2.015	-1.890	-1.808	-1.722
20.0	9.57	-1.507	-1.635	-1.789	-1.970	-1.726	-1.767	-1.792
30.0	10.01	-1.288	-1.405	-1.620	-1.716	-1.616	-1.658	-1.708
40.0	9.68	-1.096	-1.149	-1.366	-1.552	-1.452	-1.452	-1.542
50.0	8.83	-0.890	-1.041	-1.099	-1.299	-1.247	-1.329	-1.319
60.0	7.61	-0.753	-0.878	-0.958	-1.090	-1.082	-1.068	-0.986
70.0	6.11	-0.712	-0.703	-0.746	-0.851	-0.945	-0.973	-0.847
80.0	4.37	-0.658	-0.568	-0.662	-0.627	-0.644	-0.616	-0.514
90.0	2.41	-0.671	-0.676	-0.535	-0.642	-0.630	-0.562	-0.403
95.0	1.35	-0.616	-0.635	-0.676	-0.567	-0.548	-0.548	-0.403
95.0	-1.35	-0.466	-0.473	-0.662	-0.761	-0.726	-0.849	-0.833
90.0	-2.41	-0.616	-0.554	-0.789	-0.731	-0.685	-0.781	-0.792
80.0	-4.37	-0.562	-0.676	-0.859	-0.881	-0.712	-0.726	-0.750
70.0	-6.11	-0.658	-1.027	-0.901	-0.940	-0.712	-0.767	-0.764
60.0	-7.61	-1.178	-1.162	-1.225	-1.075	-0.890	-0.781	-0.833
50.0	-8.83	-1.493	-1.419	-1.380	-1.254	-1.014	-0.890	-0.917
40.0	-9.68	-1.822	-1.838	-1.803	-1.478	-1.247	-1.041	-0.903
30.0	-10.01	-1.945	-1.946	-1.930	-1.597	-1.452	-1.247	-1.097
20.0	-9.57	-2.055	-1.973	-2.042	-1.955	-1.699	-1.479	-1.375
10.0	-7.81	-1.959	-1.878	-1.901	-2.104	-1.918	-1.685	-1.611
5.0	-5.93	-1.767	-1.770	-1.831	-2.015	-1.849	-1.836	-1.889
2.5	-4.36	-1.685	-1.716	-1.775	-1.925	-1.849	-1.863	-1.861

QUADRANT II +10m/s -800rpm File: Qpm8p3.dat Span is : 0.70 m No: 5

Incidence		-30	-20	-10	0	10	20	30
%c	%t/c							
0.0	0.00	-1.453	-1.468	-1.348	-1.373	-1.319	-1.692	-1.479
2.5	4.36	-1.547	-1.645	-1.394	-1.373	-1.236	-1.631	-1.394
5.0	5.93	-1.656	-1.742	-1.318	-1.522	-1.306	-1.477	-1.394
10.0	7.81	-1.289	-1.597	-1.561	-1.433	-1.375	-1.369	-1.169
20.0	9.57	-0.922	-1.242	-1.167	-1.269	-1.278	-1.108	-1.000
30.0	10.01	-0.609	-0.710	-0.924	-0.970	-1.139	-1.000	-0.845

40.0	9.68	-0.250	-0.274	-0.515	-0.597	-0.819	-0.754	-0.620
50.0	8.83	-0.156	0.032	-0.318	-0.552	-0.361	-0.600	-0.437
60.0	7.61	-0.203	0.000	-0.227	-0.448	-0.375	-0.446	-0.451
70.0	6.11	-0.234	-0.323	-0.333	-0.448	-0.431	-0.354	-0.451
80.0	4.37	-0.516	-0.435	-0.409	-0.448	-0.486	-0.446	-0.493
90.0	2.41	-0.531	-0.435	-0.530	-0.552	-0.347	-0.446	-0.408
95.0	1.35	-0.438	-0.548	-0.318	-0.537	-0.361	-0.446	-0.380
95.0	-1.35	0.016	-0.016	-0.136	-0.478	-0.347	-0.523	-0.577
90.0	-2.41	0.156	-0.081	-0.121	-0.299	-0.333	-0.554	-0.451
80.0	-4.37	-0.016	-0.065	-0.152	-0.328	-0.306	-0.431	-0.268
70.0	-6.11	0.016	-0.242	-0.167	-0.328	-0.417	-0.338	-0.155
60.0	-7.61	-0.422	-0.452	-0.288	-0.552	-0.403	-0.400	-0.268
50.0	-8.83	-0.641	-0.726	-0.606	-0.582	-0.444	-0.323	-0.211
40.0	-9.68	-0.938	-0.968	-0.788	-0.597	-0.417	-0.477	-0.254
30.0	-10.01	-1.125	-1.065	-1.000	-0.806	-0.611	-0.523	-0.268
20.0	-9.57	-1.172	-1.290	-1.121	-1.119	-0.861	-0.785	-0.423
10.0	-7.81	-1.047	-1.258	-0.955	-1.284	-1.000	-1.092	-0.803
5.0	-5.93	-0.969	-1.129	-0.833	-1.194	-1.000	-1.415	-1.042
2.5	-4.36	-1.031	-1.242	-1.015	-1.119	-0.917	-1.385	-1.197

QUADRANT II +10m/s -800rpm File: Qpm8p3.dat Span is : 0.83 m No: 6

Incidence		-30	-20	-10	0	10	20	30
%c	%t/c							
0.0	0.00	-1.563	-1.625	-1.300	-1.597	-1.315	-1.256	-1.347
2.5	4.36	-1.563	-1.597	-1.357	-1.597	-1.219	-1.154	-1.267
5.0	5.93	-1.328	-1.694	-1.314	-1.484	-1.205	-1.013	-1.147
10.0	7.81	-1.125	-1.472	-1.357	-1.516	-1.096	-0.987	-1.013
20.0	9.57	-0.906	-0.972	-1.186	-1.113	-1.027	-0.744	-0.827
30.0	10.01	-0.469	-0.528	-0.943	-0.871	-0.863	-0.615	-0.720
40.0	9.68	-0.219	-0.181	-0.429	-0.613	-0.658	-0.346	-0.480
50.0	8.83	-0.047	-0.042	-0.371	-0.452	-0.301	-0.449	-0.240
60.0	7.61	-0.219	-0.056	-0.414	-0.516	-0.411	-0.513	-0.373
70.0	6.11	-0.125	-0.333	-0.314	-0.532	-0.425	-0.333	-0.320
80.0	4.37	-0.531	-0.514	-0.429	-0.710	-0.603	-0.641	-0.573
90.0	2.41	-0.703	-0.486	-0.571	-0.532	-0.575	-0.423	-0.507
95.0	1.35	-0.781	-0.500	-0.457	-0.806	-0.260	-0.462	-0.493
95.0	-1.35	0.078	-0.236	-0.257	-0.403	-0.110	-0.269	-0.333
90.0	-2.41	0.063	-0.167	-0.043	-0.306	-0.233	-0.179	-0.373
80.0	-4.37	0.063	-0.361	-0.186	-0.065	-0.329	-0.256	-0.200
70.0	-6.11	-0.188	-0.361	-0.086	-0.194	-0.110	-0.218	-0.240
60.0	-7.61	-0.219	-0.611	-0.414	-0.468	-0.274	-0.013	-0.107
50.0	-8.83	-0.484	-0.681	-0.529	-0.323	-0.233	-0.141	-0.160
40.0	-9.68	-0.641	-0.806	-0.743	-0.565	-0.233	-0.269	-0.027
30.0	-10.01	-0.781	-0.903	-0.729	-0.629	-0.370	-0.333	0.000
20.0	-9.57	-0.953	-1.056	-0.957	-0.984	-0.507	-0.385	-0.173
10.0	-7.81	-0.859	-1.125	-1.000	-1.242	-0.753	-0.859	-0.387
5.0	-5.93	0.906	0.653	1.014	0.726	1.000	0.641	0.987
2.5	-4.36	-0.828	-1.083	-1.014	-1.161	-1.014	-1.090	-0.893

QUADRANT II +10m/s -800rpm File: Qpm8p3.dat Span is : 0.94 m No: 7

Incidence		-30	-20	-10	0	10	20	30
%c	%t/c							
0.0	0.00	-0.576	-0.631	-0.615	-0.612	-0.631	-0.597	-0.545
2.5	4.36	-1.848	-1.923	-2.062	-1.851	-1.954	-1.836	-1.712

5.0	5.93	-1.864	-2.046	-1.938	-2.015	-2.108	-1.687	-1.773
10.0	7.81	-1.727	-2.015	-2.000	-2.060	-2.015	-1.836	-1.742
20.0	9.57	-1.591	-1.738	-1.985	-2.104	-2.123	-2.179	-1.848
30.0	10.01	-1.394	-1.662	-1.754	-1.896	-2.200	-1.896	-1.652
40.0	9.68	-0.864	-0.938	-1.169	-1.284	-1.323	-1.224	-1.212
50.0	8.83	-1.045	-1.200	-1.292	-1.597	-1.846	-1.731	-1.652
60.0	7.61	-0.939	-1.077	-1.215	-1.194	-1.477	-1.522	-1.318
70.0	6.11	-0.848	-0.923	-1.246	-1.119	-1.354	-1.328	-1.288
80.0	4.37	-0.894	-0.800	-1.108	-1.149	-1.092	-0.925	-1.121
90.0	2.41	-0.788	-0.738	-0.969	-1.030	-0.892	-0.940	-1.015
95.0	1.35	-0.879	-0.754	-0.954	-0.910	-0.908	-0.851	-0.818
95.0	-1.35	-0.273	-0.292	-0.508	-0.373	-0.446	-0.567	-0.818
90.0	-2.41	-0.212	-0.385	-0.446	-0.463	-0.523	-0.776	-0.848
80.0	-4.37	-0.197	-0.538	-0.600	-0.627	-0.462	-0.761	-0.758
70.0	-6.11	-0.409	-0.538	-0.769	-0.776	-0.738	-0.731	-0.833
60.0	-7.61	-0.788	-0.785	-0.923	-0.836	-0.954	-0.821	-0.818
50.0	-8.83	-1.000	-1.385	-1.308	-1.075	-0.969	-0.896	-0.909
40.0	-9.68	-1.530	-1.523	-1.631	-1.313	-1.154	-1.090	-1.061
30.0	-10.01	-1.909	-1.862	-1.769	-1.343	-1.354	-1.134	-1.227
20.0	-9.57	-2.000	-2.169	-2.062	-1.687	-1.554	-1.269	-1.364
10.0	-7.81	-2.015	-2.292	-2.154	-1.925	-1.769	-1.672	-1.530
5.0	-5.93	-1.879	-2.200	-1.831	-1.985	-2.200	-1.881	-1.727
2.5	-4.36	-1.894	-1.969	-1.877	-1.970	-2.015	-1.985	-1.970

QUADRANT II +10m/s -800rpm File: Qpm8p3.dat Span is : 0.97 m No: 8

Incidence		-30	-20	-10	0	10	20	30
%c	%t/c							
0.0	0.00	-0.560	-0.566	-0.577	-0.551	-0.575	-0.554	-0.500
2.5	4.36	-1.747	-1.816	-1.634	-1.783	-1.699	-1.608	-1.568
5.0	5.93	-1.693	-1.961	-1.803	-1.797	-1.630	-1.622	-1.500
10.0	7.81	-1.613	-1.697	-1.887	-1.928	-1.904	-1.581	-1.649
20.0	9.57	-1.440	-1.645	-1.789	-2.014	-1.795	-1.730	-1.527
30.0	10.01	-1.333	-1.408	-1.620	-1.826	-1.836	-1.608	-1.486
40.0	9.68	-0.947	-0.961	-1.211	-1.348	-1.466	-1.297	-1.176
50.0	8.83	-1.013	-1.079	-1.380	-1.580	-1.603	-1.527	-1.432
60.0	7.61	-0.907	-0.895	-1.028	-1.275	-1.301	-1.284	-1.270
70.0	6.11	-0.720	-0.934	-1.141	-1.188	-1.438	-1.243	-1.108
80.0	4.37	-0.813	-0.684	-0.845	-1.029	-1.233	-1.027	-0.959
90.0	2.41	-0.760	-0.816	-0.887	-0.913	-0.945	-0.905	-0.838
95.0	1.35	-0.720	-0.750	-0.986	-0.942	-1.000	-0.986	-0.811
95.0	-1.35	-0.333	-0.382	-0.535	-0.478	-0.603	-0.662	-0.797
90.0	-2.41	-0.267	-0.421	-0.437	-0.507	-0.644	-0.784	-0.770
80.0	-4.37	-0.253	-0.539	-0.549	-0.609	-0.630	-0.743	-0.811
70.0	-6.11	-0.440	-0.632	-0.803	-0.565	-0.781	-0.851	-0.811
60.0	-7.61	-0.867	-0.868	-1.197	-0.797	-0.836	-0.919	-0.824
50.0	-8.83	-1.120	-1.263	-1.577	-0.986	-0.986	-1.014	-0.932
40.0	-9.68	-1.453	-1.513	-1.380	-1.217	-1.219	-1.027	-0.973
30.0	-10.01	-1.867	-1.855	-1.676	-1.522	-1.370	-1.189	-1.095
20.0	-9.57	-1.800	-1.908	-1.944	-1.681	-1.562	-1.351	-1.081
10.0	-7.81	-1.747	-1.868	-2.127	-1.826	-1.575	-1.527	-1.405
5.0	-5.93	-1.693	-1.908	-1.972	-1.971	-1.753	-1.608	-1.378
2.5	-4.36	-1.667	-1.882	-1.930	-1.899	-1.918	-1.581	-1.514

QUADRANT III -10m/s -800rpm File: Qmm8p3.dat Span is : 0.07 m No: 1

Incidence		-30	-20	-10	0	10	20	30
%c	%t/c							
0.0	0.00	-0.718	-0.629	-0.186	-0.100	-0.056	-0.657	-1.145
2.5	4.36	-0.859	-0.571	-0.200	-0.129	-0.085	-0.571	-1.014
5.0	5.93	-0.817	-0.586	-0.186	-0.200	-0.225	-0.600	-1.087
10.0	7.81	-0.746	-0.700	-0.186	-0.329	-0.394	-0.643	-1.072
20.0	9.57	-0.577	-0.529	-0.243	-0.429	-0.479	-0.729	-1.188
30.0	10.01	-0.225	-0.329	-0.214	-0.414	-0.493	-0.743	-1.188
40.0	9.68	0.099	-0.100	-0.100	-0.314	-0.493	-0.786	-1.232
50.0	8.83	0.310	0.143	0.043	-0.229	-0.465	-0.771	-1.261
60.0	7.61	0.507	0.271	0.171	-0.157	-0.465	-0.857	-1.188
70.0	6.11	0.676	0.471	0.314	-0.071	-0.408	-0.886	-1.159
80.0	4.37	0.873	0.714	0.514	0.043	-0.366	-1.014	-1.130
90.0	2.41	1.056	0.914	0.771	0.200	-1.380	-0.943	-1.116
95.0	1.35	1.099	1.071	0.914	0.371	-1.746	-0.843	-1.116
95.0	-1.35	-0.901	-0.686	-1.800	0.114	0.859	1.071	1.188
90.0	-2.41	-0.831	-0.729	-1.800	0.029	0.620	0.886	1.072
80.0	-4.37	-0.958	-0.814	-1.329	-0.071	0.366	0.600	0.841
70.0	-6.11	-1.000	-0.771	-0.700	-0.129	0.225	0.429	0.609
60.0	-7.61	-1.056	-0.829	-0.743	-0.314	0.000	0.129	0.304
50.0	-8.83	-1.099	-0.857	-0.586	-0.343	-0.099	0.000	0.145
40.0	-9.68	-1.169	-0.829	-0.600	-0.457	-0.239	-0.200	-0.116
30.0	-10.01	-1.070	-0.786	-0.571	-0.529	-0.394	-0.486	-0.493
20.0	-9.57	-0.986	-0.771	-0.500	-0.500	-0.394	-0.643	-0.899
10.0	-7.81	-0.577	-0.543	-0.414	-0.229	-0.296	-0.586	-1.072
5.0	-5.93	-0.662	-0.629	-0.328	-0.229	-0.254	-0.614	-1.203
2.5	-4.36	-0.268	-0.571	-0.200	-0.129	0.127	-0.586	-1.188

QUADRANT III -10m/s -800rpm File: Qmm8p3.dat Span is : 0.23 m No: 2

Incidence		-30	-20	-10	0	10	20	30
%c	%t/c							
0.0	0.00	-0.917	-0.603	-0.136	-0.116	-0.060	-0.716	-1.132
2.5	4.36	-0.736	-0.676	-0.182	-0.130	-0.060	-0.716	-1.147
5.0	5.93	-0.722	-0.647	-0.197	-0.159	-0.104	-0.746	-1.132
10.0	7.81	-0.722	-0.662	-0.182	-0.304	-0.299	-0.806	-1.265
20.0	9.57	-0.583	-0.676	-0.258	-0.304	-0.522	-0.881	-1.250
30.0	10.01	-0.236	-0.426	-0.273	-0.377	-0.582	-0.881	-1.265
40.0	9.68	0.056	-0.162	-0.167	-0.348	-0.582	-0.910	-1.206
50.0	8.83	0.306	0.059	-0.015	-0.290	-0.537	-0.925	-1.221
60.0	7.61	0.528	0.265	0.121	-0.174	-0.478	-0.970	-1.176
70.0	6.11	0.681	0.471	0.303	-0.087	-0.493	-0.985	-1.191
80.0	4.37	0.917	0.691	0.500	0.014	-0.970	-0.896	-1.118
90.0	2.41	1.139	0.971	0.773	0.203	-1.463	-0.925	-1.103
95.0	1.35	1.222	1.118	1.000	0.333	-1.463	-0.925	-1.074
95.0	-1.35	-0.917	0.176	-1.424	0.203	0.910	1.164	1.265
90.0	-2.41	-0.833	-0.765	-1.485	0.072	0.657	0.985	1.162
80.0	-4.37	-0.903	-0.853	-1.439	-0.101	0.373	0.657	0.868
70.0	-6.11	-0.958	-0.868	-1.121	-0.188	0.194	0.448	0.618
60.0	-7.61	-1.000	-0.941	-0.712	-0.319	0.015	0.224	0.426
50.0	-8.83	-0.986	-0.926	-0.561	-0.435	-0.179	-0.015	0.147
40.0	-9.68	-1.028	-0.926	-0.576	-0.536	-0.328	-0.254	-0.221
30.0	-10.01	-1.111	-0.941	-0.561	-0.580	-0.448	-0.463	-0.471
20.0	-9.57	-1.028	-0.912	-0.500	-0.681	-0.567	-0.746	-0.912

10.0	-7.81	-0.792	-0.632	-0.288	-0.391	-0.239	-0.657	-1.162
5.0	-5.93	-0.986	-0.662	-0.197	-0.130	-0.313	-0.731	-1.103
2.5	-4.36	-0.556	-0.691	-0.106	-0.072	-0.015	-0.552	-1.103

QUADRANT III -10m/s -800rpm File: Qmm8p3.dat Span is : 0.40 m No: 3

Incidence		-30	-20	-10	0	10	20	30
%c	%t/c							
0.0	0.00	-0.929	-0.652	-0.129	-0.058	0.014	-0.623	-1.000
2.5	4.36	-0.829	-0.594	-0.143	-0.145	0.000	-0.681	-1.043
5.0	5.93	-0.814	-0.594	-0.143	-0.188	-0.014	-0.739	-1.100
10.0	7.81	-1.057	-0.609	-0.129	-0.333	-0.129	-0.768	-1.200
20.0	9.57	-0.671	-0.638	-0.186	-0.362	-0.357	-0.855	-1.271
30.0	10.01	-0.343	-0.406	-0.243	-0.464	-0.471	-0.913	-1.286
40.0	9.68	-0.014	-0.174	-0.143	-0.406	-0.486	-0.971	-1.214
50.0	8.83	0.229	0.043	-0.029	-0.348	-0.471	-0.971	-1.200
60.0	7.61	0.471	0.246	0.114	-0.261	-0.471	-1.058	-1.186
70.0	6.11	0.686	0.449	0.257	-0.159	-0.600	-0.986	-1.157
80.0	4.37	0.900	0.667	0.471	-0.014	-1.071	-0.971	-1.129
90.0	2.41	1.129	0.957	0.743	0.159	-1.343	-0.942	-1.114
95.0	1.35	1.229	1.116	0.957	0.275	-1.300	-0.870	-1.114
95.0	-1.35	-0.957	-0.855	-1.329	0.174	0.743	0.971	1.043
90.0	-2.41	-0.971	-0.884	-1.400	0.058	0.657	0.942	1.143
80.0	-4.37	-1.014	-0.928	-1.300	-0.087	0.371	0.652	0.900
70.0	-6.11	-1.043	-0.899	-0.943	-0.203	0.186	0.420	0.671
60.0	-7.61	-1.086	-0.942	-0.586	-0.304	0.014	0.203	0.429
50.0	-8.83	-1.100	-0.928	-0.486	-0.435	-0.171	-0.029	0.186
40.0	-9.68	-1.143	-0.942	-0.529	-0.536	-0.343	-0.275	-0.114
30.0	-10.01	-1.157	-0.928	-0.557	-0.638	-0.500	-0.551	-0.471
20.0	-9.57	-1.114	-0.899	-0.529	-0.681	-0.600	-0.710	-0.886
10.0	-7.81	-1.086	-0.855	-0.343	-0.435	-0.514	-0.855	-1.086
5.0	-5.93	-0.986	-0.797	-0.257	-0.116	-0.186	-0.652	-1.057
2.5	-4.36	-1.014	-0.797	-0.171	-0.072	-0.086	-0.681	-1.071

QUADRANT III -10m/s -800rpm File: Qmm8p3.dat Span is : 0.53 m No: 4

Incidence		-30	-20	-10	0	10	20	30
%c	%t/c							
0.0	0.00	-0.743	-0.612	-0.159	-0.066	-0.052	-0.604	-0.940
2.5	4.36	-0.721	-0.426	-0.147	-0.132	0.000	-0.612	-0.985
5.0	5.93	-0.676	-0.412	-0.118	-0.088	0.015	-0.657	-1.060
10.0	7.81	-0.750	-0.397	-0.118	-0.162	-0.090	-0.821	-1.164
20.0	9.57	-0.632	-0.485	-0.147	-0.221	-0.388	-0.896	-1.343
30.0	10.01	-0.309	-0.324	-0.221	-0.294	-0.478	-1.000	-1.358
40.0	9.68	-0.015	-0.132	-0.132	-0.324	-0.493	-1.060	-1.299
50.0	8.83	0.221	0.059	-0.029	-0.294	-0.493	-1.075	-1.284
60.0	7.61	0.456	0.265	0.118	-0.221	-0.478	-1.075	-1.239
70.0	6.11	0.662	0.441	0.250	-0.147	-0.642	-1.090	-1.239
80.0	4.37	0.882	0.676	0.471	0.000	-1.104	-1.030	-1.224
90.0	2.41	1.118	0.941	0.735	0.132	-1.358	-1.000	-1.209
95.0	1.35	1.206	1.118	0.941	0.265	-1.328	-0.985	-1.209
95.0	-1.35	-1.059	0.096	-1.382	0.206	0.746	0.970	1.045
90.0	-2.41	-1.103	-0.926	-1.426	0.103	0.687	0.955	1.149
80.0	-4.37	-1.162	-0.926	-1.279	-0.059	0.388	0.657	0.896
70.0	-6.11	-1.118	-0.971	-0.735	-0.162	0.194	0.433	0.672
60.0	-7.61	-1.206	-0.971	-0.471	-0.294	0.015	0.224	0.448

50.0	-8.83	-1.235	-0.956	-0.485	-0.426	-0.164	0.000	0.164
40.0	-9.68	-1.191	-0.912	-0.544	-0.529	-0.328	-0.224	-0.119
30.0	-10.01	-1.294	-0.882	-0.574	-0.632	-0.478	-0.478	-0.463
20.0	-9.57	-1.279	-0.838	-0.559	-0.676	-0.552	-0.687	-0.791
10.0	-7.81	-1.176	-0.765	-0.412	-0.485	-0.448	-0.627	-0.970
5.0	-5.93	-0.897	-0.706	-0.235	-0.059	-0.224	-0.597	-0.851
2.5	-4.36	-0.941	-0.647	-0.162	0.000	-0.104	-0.597	-0.896

QUADRANT III -10m/s -800rpm File: Qmm8p3.dat Span is : 0.70 m No: 5

Incidence		-30	-20	-10	0	10	20	30
%c	%t/c							
0.0	0.00	-0.557	-0.151	0.083	0.141	0.186	-0.449	-0.691
2.5	4.36	-0.457	-0.041	0.153	0.099	0.314	-0.333	-0.735
5.0	5.93	-0.357	0.027	0.236	0.225	0.443	-0.232	-0.676
10.0	7.81	-0.257	0.137	0.361	0.211	0.386	-0.174	-0.691
20.0	9.57	-0.043	0.151	0.500	0.338	0.271	-0.145	-0.603
30.0	10.01	0.514	0.370	0.625	0.394	0.300	-0.087	-0.574
40.0	9.68	0.857	0.685	0.764	0.577	0.471	-0.087	-0.485
50.0	8.83	0.971	0.890	0.833	0.634	0.543	-0.159	-0.397
60.0	7.61	0.986	0.904	0.792	0.549	0.343	-0.333	-0.574
70.0	6.11	0.714	0.589	0.583	0.296	0.214	-0.174	-0.250
80.0	4.37	0.986	0.822	0.819	0.225	-0.600	-0.855	-1.000
90.0	2.41	1.171	1.014	1.042	0.296	-1.086	-0.913	-1.074
95.0	1.35	1.300	1.192	1.236	0.380	-1.057	-0.841	-1.015
95.0	-1.35	-0.957	-0.740	-0.958	0.352	1.114	1.246	1.426
90.0	-2.41	-0.971	-0.644	-0.917	0.310	0.929	1.087	1.353
80.0	-4.37	-0.843	-0.562	-0.319	0.254	0.757	0.870	1.235
70.0	-6.11	-0.786	-0.589	0.333	0.211	0.700	0.783	1.029
60.0	-7.61	-0.671	-0.507	0.389	0.169	0.557	0.681	0.971
50.0	-8.83	-0.600	-0.411	0.403	0.282	0.529	0.565	0.853
40.0	-9.68	-0.529	-0.164	0.444	0.324	0.443	0.493	0.647
30.0	-10.01	-0.457	0.000	0.423	0.324	0.357	0.333	0.338
20.0	-9.57	-0.500	0.151	0.403	0.268	0.386	0.188	0.088
10.0	-7.81	-0.471	0.247	0.458	0.408	0.486	0.101	-0.074
5.0	-5.93	-0.486	0.260	0.722	0.606	0.757	-0.058	-0.147
2.5	-4.36	-0.357	0.137	0.556	0.535	0.629	-0.087	-0.294

QUADRANT III -10m/s -800rpm File: Qmm8p3.dat Span is : 0.83 m No: 6

Incidence		-30	-20	-10	0	10	20	30
%c	%t/c							
0.0	0.00	-0.731	-0.348	-0.072	0.134	0.130	-0.192	-0.875
2.5	4.36	-0.716	-0.203	-0.029	0.164	0.203	-0.247	-0.906
5.0	5.93	-0.582	-0.072	0.072	0.239	0.203	-0.205	-0.875
10.0	7.81	-0.537	0.029	0.217	0.239	0.116	-0.288	-0.875
20.0	9.57	-0.269	0.058	0.348	0.313	0.029	-0.288	-0.484
30.0	10.01	0.269	0.246	0.464	0.343	0.116	-0.123	-0.531
40.0	9.68	0.612	0.551	0.609	0.418	0.217	-0.082	-0.500
50.0	8.83	0.925	0.725	0.652	0.552	0.232	-0.137	-0.547
60.0	7.61	0.940	0.638	0.580	0.478	0.290	0.562	0.469
70.0	6.11	0.448	0.435	0.348	0.313	0.159	0.000	0.344
80.0	4.37	0.851	0.551	0.478	0.104	-0.203	-0.932	-1.094
90.0	2.41	0.925	0.667	0.522	0.164	-0.406	-0.918	-1.141
95.0	1.35	1.254	1.116	0.942	0.358	-1.333	-0.918	-1.125
95.0	-1.35	-1.030	-0.812	-1.435	0.433	0.928	1.123	1.406

90.0	-2.41	-0.970	-0.841	-1.333	0.358	0.754	0.973	1.438
80.0	-4.37	-0.970	-0.841	-0.043	0.269	0.580	0.781	1.078
70.0	-6.11	-1.015	-0.739	0.029	0.224	0.464	0.616	1.016
60.0	-7.61	-0.955	-0.609	0.000	0.164	0.391	0.493	0.875
50.0	-8.83	-0.806	-0.275	0.058	0.164	0.348	0.411	0.703
40.0	-9.68	-0.687	-0.130	0.058	0.194	0.290	0.370	0.500
30.0	-10.01	-0.552	-0.029	0.072	0.194	0.203	0.274	0.250
20.0	-9.57	-0.522	-0.014	0.058	0.224	0.145	0.151	-0.109
10.0	-7.81	-0.522	0.145	0.072	0.343	0.217	0.164	-0.484
5.0	-5.93	0.687	0.710	0.623	0.866	0.739	0.726	0.656
2.5	-4.36	-0.627	-0.087	0.261	0.522	0.391	-0.027	-0.563

QUADRANT III -10m/s -800rpm File: Qmm8p3.dat Span is : 0.94 m No: 7

Incidence		-30	-20	-10	0	10	20	30
%c	%t/c							
0.0	0.00	-0.718	-0.620	-0.208	0.014	-0.042	-0.629	-0.884
2.5	4.36	-0.915	-0.662	-0.250	0.014	-0.097	-0.814	-1.174
5.0	5.93	-0.915	-0.549	-0.208	-0.087	-0.306	-1.243	-1.145
10.0	7.81	-0.930	-0.535	-0.167	-0.290	-0.500	-1.586	-1.159
20.0	9.57	-0.592	-0.465	-0.236	-0.377	-0.500	-1.186	-1.246
30.0	10.01	-0.282	-0.310	-0.208	-0.319	-0.472	-0.871	-1.246
40.0	9.68	-0.099	-0.127	-0.069	-0.145	-0.236	-0.514	-0.870
50.0	8.83	0.099	-0.014	-0.028	-0.203	-0.347	-0.743	-1.275
60.0	7.61	0.254	0.070	0.042	-0.145	-0.333	-0.743	-1.217
70.0	6.11	0.408	0.211	0.139	-0.116	-0.306	-0.900	-1.246
80.0	4.37	0.577	0.352	0.292	-0.029	-0.264	-1.171	-1.217
90.0	2.41	0.845	0.648	0.500	0.072	-0.181	-1.243	-1.203
95.0	1.35	1.042	0.873	0.667	0.203	-1.444	-1.157	-1.203
95.0	-1.35	-1.056	-1.085	-1.833	0.203	0.681	0.886	1.087
90.0	-2.41	-1.113	-1.225	-0.306	0.087	0.444	0.629	0.870
80.0	-4.37	-1.197	-1.225	-0.333	-0.043	0.236	0.329	0.565
70.0	-6.11	-1.225	-0.887	-0.347	-0.130	0.111	0.171	0.377
60.0	-7.61	-1.268	-0.620	-0.458	-0.188	-0.014	0.057	0.174
50.0	-8.83	-1.225	-0.620	-0.486	-0.246	-0.111	-0.071	0.000
40.0	-9.68	-1.169	-0.718	-0.500	-0.333	-0.222	-0.229	-0.203
30.0	-10.01	-1.113	-0.803	-0.569	-0.435	-0.361	-0.443	-0.478
20.0	-9.57	-1.099	-1.028	-0.653	-0.449	-0.444	-0.629	-0.768
10.0	-7.81	-1.014	-1.577	-0.806	-0.362	-0.403	-0.800	-1.174
5.0	-5.93	-1.028	-2.099	-0.625	-0.246	-0.389	-0.729	-1.072
2.5	-4.36	-1.028	-1.225	-0.444	-0.043	-0.153	-0.800	-1.072

QUADRANT III -10m/s -800rpm File: Qmm8p3.dat Span is : 0.97 m No: 8

Incidence		-30	-20	-10	0	10	20	30
%c	%t/c							
0.0	0.00	-0.739	-0.696	-0.214	-0.074	-0.103	-0.725	-0.897
2.5	4.36	-0.971	-0.739	-0.229	-0.132	-0.265	-1.130	-1.162
5.0	5.93	-0.971	-0.652	-0.214	-0.147	-0.662	-1.348	-1.191
10.0	7.81	-1.000	-0.652	-0.171	-0.206	-1.059	-1.391	-1.235
20.0	9.57	-0.667	-0.522	-0.257	-0.250	-0.838	-1.464	-1.294
30.0	10.01	-0.406	-0.377	-0.229	-0.250	-0.574	-1.493	-1.294
40.0	9.68	-0.203	-0.217	-0.114	-0.162	-0.294	-0.870	-1.074
50.0	8.83	-0.072	-0.159	-0.100	-0.176	-0.368	-0.884	-1.265
60.0	7.61	0.072	-0.072	-0.029	-0.162	-0.338	-0.667	-1.265
70.0	6.11	0.130	-0.029	0.043	-0.088	-0.338	-0.812	-1.265

80.0	4.37	0.348	0.116	0.157	-0.044	-0.294	-1.275	-1.191
90.0	2.41	0.623	0.406	0.357	0.059	-0.309	-1.246	-1.191
95.0	1.35	0.841	0.667	0.571	0.132	-0.118	-1.246	-1.176
95.0	-1.35	-1.072	-0.297	-0.129	0.147	0.544	0.710	0.897
90.0	-2.41	-1.116	-1.261	-0.257	0.059	0.338	0.449	0.691
80.0	-4.37	-1.174	-1.188	-0.271	-0.044	0.118	0.145	0.412
70.0	-6.11	-1.246	-0.739	-0.271	-0.118	0.015	0.000	0.250
60.0	-7.61	-1.203	-0.739	-0.314	-0.191	-0.074	-0.116	0.029
50.0	-8.83	-1.232	-0.870	-0.371	-0.235	-0.162	-0.217	-0.074
40.0	-9.68	-1.217	-1.246	-0.471	-0.309	-0.265	-0.333	-0.265
30.0	-10.01	-1.174	-1.493	-0.643	-0.397	-0.353	-0.478	-0.515
20.0	-9.57	-1.145	-1.522	-0.986	-0.485	-0.412	-0.609	-0.721
10.0	-7.81	-1.087	-1.551	-1.443	-0.574	-0.382	-0.797	-1.147
5.0	-5.93	-1.058	-1.464	-1.071	-0.603	-0.324	-0.710	-1.088
2.5	-4.36	-1.043	-1.072	-0.571	-0.368	-0.147	-0.754	-1.118

QUADRANT III -10m/s -1460rpm File: Qmm14p3.dat Span is : 0.07 m No: 1

Incidence		-30	-20	-10	0	10	20	30
%c	%t/c							
0.0	0.00	-1.174	-0.775	-0.343	-0.286	-0.169	-0.925	-1.357
2.5	4.36	-1.072	-0.775	-0.386	-0.393	-0.254	-0.672	-1.329
5.0	5.93	-1.130	-0.732	-0.400	-0.500	-0.380	-0.836	-1.286
10.0	7.81	-1.188	-0.704	-0.357	-0.543	-0.549	-0.925	-1.286
20.0	9.57	-0.565	-0.634	-0.414	-0.614	-0.676	-1.015	-1.571
30.0	10.01	-0.246	-0.380	-0.314	-0.614	-0.676	-1.104	-1.714
40.0	9.68	0.087	-0.070	-0.157	-0.471	-0.690	-1.149	-1.786
50.0	8.83	0.290	0.099	0.000	-0.300	-0.634	-1.179	-1.700
60.0	7.61	0.522	0.338	0.143	-0.243	-0.606	-1.254	-1.629
70.0	6.11	0.739	0.479	0.271	-0.129	-0.563	-1.418	-1.700
80.0	4.37	0.942	0.704	0.500	0.029	-0.465	-1.582	-1.514
90.0	2.41	1.130	0.958	0.743	0.171	-1.338	-1.597	-1.443
95.0	1.35	1.188	1.127	0.986	0.343	-1.887	-1.507	-1.443
95.0	-1.35	-1.232	-1.239	-1.886	0.086	0.845	1.104	1.214
90.0	-2.41	-1.275	-1.211	-1.857	-0.014	0.592	0.925	1.100
80.0	-4.37	-1.391	-1.268	-1.229	-0.114	0.338	0.642	0.871
70.0	-6.11	-1.493	-1.268	-0.643	-0.186	0.127	0.433	0.671
60.0	-7.61	-1.449	-1.239	-0.700	-0.400	-0.085	0.134	0.329
50.0	-8.83	-1.623	-1.239	-0.614	-0.457	-0.211	-0.030	0.129
40.0	-9.68	-1.638	-1.268	-0.614	-0.557	-0.366	-0.239	-0.129
30.0	-10.01	-1.551	-1.169	-0.586	-0.600	-0.549	-0.522	-0.500
20.0	-9.57	-1.464	-1.183	-0.457	-0.600	-0.690	-0.687	-0.914
10.0	-7.81	-0.971	-0.915	-0.414	-0.400	-0.662	-1.060	-1.314
5.0	-5.93	-1.043	-0.732	-0.429	-0.514	-0.352	-0.746	-1.271
2.5	-4.36	-1.058	-0.704	-0.443	-0.371	-0.085	-1.045	-0.243

QUADRANT III -10m/s -1460rpm File: Qmm14p3.dat Span is : 0.23 m No: 2

Incidence		-30	-20	-10	0	10	20	30
%c	%t/c							
0.0	0.00	-1.324	-0.896	-0.357	-0.338	-0.194	-0.779	-1.353
2.5	4.36	-1.368	-0.821	-0.371	-0.412	-0.209	-0.765	-1.412
5.0	5.93	-1.456	-0.746	-0.371	-0.485	-0.269	-0.838	-1.279
10.0	7.81	-1.125	-0.821	-0.329	-0.500	-0.522	-0.868	-1.515
20.0	9.57	-0.794	-0.761	-0.429	-0.515	-0.746	-0.971	-1.618
30.0	10.01	-0.397	-0.463	-0.400	-0.603	-0.866	-1.074	-1.838

40.0	9.68	-0.059	-0.194	-0.243	-0.544	-0.701	-1.221	-1.809
50.0	8.83	0.235	0.060	-0.057	-0.397	-0.657	-1.368	-1.868
60.0	7.61	0.515	0.284	0.086	-0.265	-0.672	-1.456	-1.721
70.0	6.11	0.735	0.493	0.257	-0.162	-0.657	-1.485	-1.662
80.0	4.37	0.926	0.731	0.471	0.000	-1.075	-1.559	-1.647
90.0	2.41	1.191	1.030	0.743	0.191	-1.642	-1.544	-1.544
95.0	1.35	1.279	1.209	0.971	0.338	-1.642	-1.485	-1.559
95.0	-1.35	-1.368	-1.313	-1.471	0.103	0.836	1.147	1.191
90.0	-2.41	-1.294	-1.254	-1.486	0.015	0.567	0.956	1.162
80.0	-4.37	-1.441	-1.284	-1.443	-0.147	0.254	0.647	0.912
70.0	-6.11	-1.471	-1.313	-1.043	-0.265	0.045	0.412	0.691
60.0	-7.61	-1.529	-1.313	-0.671	-0.426	-0.209	0.191	0.426
50.0	-8.83	-1.647	-1.328	-0.600	-0.529	-0.373	-0.044	0.147
40.0	-9.68	-1.662	-1.284	-0.643	-0.662	-0.597	-0.294	-0.147
30.0	-10.01	-1.676	-1.254	-0.686	-0.721	-0.716	-0.544	-0.515
20.0	-9.57	-1.574	-1.209	-0.729	-0.897	-0.925	-0.838	-0.941
10.0	-7.81	-1.456	-1.090	-0.643	-0.824	-0.806	-0.750	-1.368
5.0	-5.93	-1.309	-0.955	-0.486	-0.397	-0.388	-0.765	-1.147
2.5	-4.36	-1.132	-0.896	-0.386	-0.309	-0.224	-0.735	-1.279

QUADRANT III -10m/s -1460rpm File: Qmm14p3.dat Span is : 0.40 m No: 3

Incidence		-30	-20	-10	0	10	20	30
%c	%t/c							
0.0	0.00	-1.710	-0.899	-0.304	-0.261	-0.159	-0.725	-1.232
2.5	4.36	-1.710	-0.841	-0.319	-0.319	-0.174	-0.797	-1.362
5.0	5.93	-1.580	-0.768	-0.333	-0.377	-0.203	-0.783	-1.536
10.0	7.81	-1.406	-0.870	-0.319	-0.507	-0.391	-0.855	-1.696
20.0	9.57	-0.826	-0.768	-0.406	-0.551	-0.652	-0.986	-1.739
30.0	10.01	-0.391	-0.478	-0.406	-0.638	-0.710	-1.116	-1.783
40.0	9.68	-0.043	-0.203	-0.261	-0.565	-0.681	-1.217	-1.754
50.0	8.83	0.217	0.014	-0.116	-0.464	-0.638	-1.275	-1.826
60.0	7.61	0.478	0.232	0.043	-0.333	-0.594	-1.377	-1.797
70.0	6.11	0.696	0.435	0.217	-0.232	-0.638	-1.377	-1.739
80.0	4.37	0.913	0.696	0.435	-0.072	-1.087	-1.362	-1.667
90.0	2.41	1.145	0.971	0.725	0.130	-1.478	-1.275	-1.594
95.0	1.35	1.232	1.145	0.957	0.261	-1.464	-1.217	-1.565
95.0	-1.35	-1.391	-1.217	-1.493	0.145	0.754	0.957	1.029
90.0	-2.41	-1.449	-1.261	-1.565	0.029	0.652	0.971	1.159
80.0	-4.37	-1.522	-1.304	-1.420	-0.145	0.348	0.652	0.913
70.0	-6.11	-1.551	-1.348	-0.942	-0.275	0.130	0.420	0.681
60.0	-7.61	-1.609	-1.333	-0.638	-0.391	-0.058	0.188	0.435
50.0	-8.83	-1.652	-1.304	-0.638	-0.551	-0.261	-0.072	0.159
40.0	-9.68	-1.565	-1.275	-0.725	-0.681	-0.464	-0.319	-0.159
30.0	-10.01	-1.652	-1.217	-0.812	-0.826	-0.667	-0.638	-0.536
20.0	-9.57	-1.522	-1.145	-0.855	-0.913	-0.855	-0.957	-1.000
10.0	-7.81	-1.435	-1.145	-0.681	-0.725	-0.855	-1.101	-1.391
5.0	-5.93	-1.333	-1.058	-0.420	-0.319	-0.391	-0.928	-1.406
2.5	-4.36	-1.348	-1.072	-0.362	-0.246	-0.188	-0.826	-1.391

QUADRANT III -10m/s -1460rpm File: Qmm14p3.dat Span is : 0.53 m No: 4

Incidence		-30	-20	-10	0	10	20	30
%c	%t/c							
0.0	0.00	-1.710	-0.900	-0.304	14.418	-0.179	-0.826	-1.420
2.5	4.36	-1.710	-0.840	-0.388	-0.388	-0.174	-0.823	-1.450

5.0	5.93	-0.866	-0.642	-0.343	-0.358	-0.179	-0.821	-1.478
10.0	7.81	-0.799	-0.657	-0.313	-0.418	-0.119	-0.776	-1.463
20.0	9.57	-0.731	-0.701	-0.403	-0.418	-0.687	-0.955	-1.791
30.0	10.01	-0.746	-0.493	-0.388	-0.522	-0.672	-1.000	-1.791
40.0	9.68	-0.045	-0.179	-0.254	-0.478	-0.701	-1.254	-1.970
50.0	8.83	0.239	0.045	-0.119	-0.403	-0.687	-1.164	-1.806
60.0	7.61	0.478	0.254	0.060	-0.299	-0.582	-1.418	-1.851
70.0	6.11	0.687	0.448	0.209	-0.194	-0.552	-1.448	-1.851
80.0	4.37	0.925	0.701	0.448	-0.030	-0.985	-1.418	-1.776
90.0	2.41	1.134	0.970	0.731	0.134	-1.552	-1.343	-1.731
95.0	1.35	1.239	1.149	0.955	0.269	-1.552	-1.328	-1.701
95.0	-1.35	-1.552	-1.313	-1.567	0.149	0.761	0.940	-1.627
90.0	-2.41	-1.627	-1.373	-1.627	0.045	0.657	0.970	1.149
80.0	-4.37	-1.597	-1.433	-1.328	-0.134	0.358	0.657	0.896
70.0	-6.11	-1.716	-1.403	-0.701	-0.269	0.149	0.433	0.687
60.0	-7.61	-1.701	-1.373	-0.552	-0.403	-0.060	0.209	0.433
50.0	-8.83	-1.687	-1.358	-0.642	-0.552	-0.254	-0.030	0.179
40.0	-9.68	-1.657	-1.328	-0.761	-0.716	-0.478	-0.299	-0.134
30.0	-10.01	-1.657	-1.254	-0.851	-0.836	-0.672	-0.582	-0.478
20.0	-9.57	-1.582	-1.134	-0.896	-0.910	-0.836	-0.866	-0.851
10.0	-7.81	-1.403	-1.000	-0.776	-0.642	-0.791	-1.075	-1.164
5.0	-5.93	-1.224	-0.955	-0.522	-0.299	-0.313	-1.060	-1.060
2.5	-4.36	-1.254	-0.910	-0.373	-0.239	-0.179	-1.060	-1.060

QUADRANT III -10m/s -1460rpm File: Qmm14p3.dat Span is : 0.70 m No: 5

Incidence		-30	-20	-10	0	10	20	30
%c	%t/c							
0.0	0.00	-0.652	-0.300	-0.147	-0.028	-0.030	-0.329	-0.826
2.5	4.36	-0.507	-0.243	-0.103	0.014	0.121	-0.357	-0.870
5.0	5.93	-0.362	-0.143	-0.044	0.056	0.152	-0.329	-0.899
10.0	7.81	-0.406	-0.029	0.206	0.042	0.030	-0.386	-0.797
20.0	9.57	-0.043	0.086	0.338	0.141	-0.136	-0.314	-0.826
30.0	10.01	0.464	0.329	0.456	0.155	-0.076	-0.243	-0.957
40.0	9.68	0.754	0.700	0.632	0.310	0.106	-0.257	-0.913
50.0	8.83	1.029	0.986	0.691	0.507	0.258	-0.371	-0.971
60.0	7.61	1.029	0.929	0.676	0.479	0.152	-0.700	-1.116
70.0	6.11	0.667	0.700	0.574	0.254	0.242	-0.614	-0.797
80.0	4.37	0.957	0.829	0.647	0.155	-0.591	-1.257	-1.522
90.0	2.41	1.188	1.086	0.853	0.324	-1.318	-1.329	-1.565
95.0	1.35	1.319	1.271	1.103	0.423	-1.303	-1.286	-1.580
95.0	-1.35	-1.362	-1.157	-1.647	0.352	1.061	1.214	1.420
90.0	-2.41	-1.377	-1.114	-1.500	0.296	0.879	1.100	1.391
80.0	-4.37	-1.275	-1.014	-0.088	0.225	0.697	0.843	1.261
70.0	-6.11	-1.261	-1.071	0.015	0.127	0.576	0.643	1.130
60.0	-7.61	-1.159	-0.871	0.000	0.070	0.470	0.586	0.971
50.0	-8.83	-1.029	-0.629	-0.074	0.056	0.394	0.471	0.812
40.0	-9.68	-0.884	-0.329	0.000	0.099	0.242	0.371	0.565
30.0	-10.01	-0.638	-0.143	-0.103	0.099	0.076	0.200	0.275
20.0	-9.57	-0.507	-0.014	-0.074	0.070	0.061	0.014	0.000
10.0	-7.81	-0.420	0.043	0.074	0.127	0.091	-0.171	-0.188
5.0	-5.93	-0.478	0.071	0.265	0.465	0.500	-0.171	-0.246
2.5	-4.36	-0.507	0.014	0.221	0.380	0.394	-0.057	-0.304

QUADRANT III -10m/s -1460rpm File: Qmm14p3.dat Span is : 0.83 m No: 6

Incidence		-30	-20	-10	0	10	20	30
%c	%t/c							
0.0	0.00	-0.891	-0.469	-0.281	-0.141	-0.078	-0.375	-1.156
2.5	4.36	-0.906	-0.391	-0.234	-0.031	-0.016	-0.313	-1.188
5.0	5.93	-0.922	-0.266	-0.219	-0.047	0.031	-0.531	-1.266
10.0	7.81	-0.820	-0.188	-0.094	0.016	0.156	-0.516	-1.219
20.0	9.57	-0.719	-0.094	0.031	0.078	-0.203	-0.641	-1.219
30.0	10.01	-0.188	-0.016	0.125	0.109	0.063	-0.563	-0.734
40.0	9.68	0.609	0.563	0.328	0.250	0.047	-0.188	-0.844
50.0	8.83	0.656	0.578	0.438	0.297	-0.047	-0.141	-0.891
60.0	7.61	0.766	0.750	0.719	0.641	0.813	0.750	0.859
70.0	6.11	0.375	0.500	0.391	0.438	0.625	0.422	0.594
80.0	4.37	0.250	0.313	0.188	0.094	0.453	0.234	0.281
90.0	2.41	0.938	0.781	0.500	0.047	-0.516	-1.641	-1.750
95.0	1.35	1.141	0.969	0.719	0.359	-1.063	-1.719	-1.781
95.0	-1.35	-1.563	-1.563	-1.703	0.383	1.172	1.281	1.328
90.0	-2.41	-1.516	-1.578	-1.641	0.406	1.266	1.297	1.297
80.0	-4.37	-1.531	-1.516	-0.125	0.219	0.813	0.875	0.969
70.0	-6.11	-1.547	-1.484	-0.094	0.266	0.859	0.906	1.016
60.0	-7.61	-1.391	-0.594	-0.156	0.063	0.656	0.547	0.750
50.0	-8.83	-1.297	-0.516	-0.078	0.047	0.641	0.641	0.828
40.0	-9.68	-0.766	-0.203	-0.156	-0.031	0.156	0.328	0.422
30.0	-10.01	-0.688	-0.203	-0.250	-0.156	0.141	0.422	0.484
20.0	-9.57	-0.813	-0.391	-0.266	-0.156	-0.219	-0.063	-0.234
10.0	-7.81	-0.609	-0.391	-0.313	-0.094	-0.281	-0.078	-0.313
5.0	-5.93	0.719	0.984	0.781	1.156	0.750	0.922	0.578
2.5	-4.36	0.609	0.469	0.047	0.250	0.969	0.875	0.547

QUADRANT III -10m/s -1460rpm File: Qmm14p3.dat Span is : 0.94 m No: 7

Incidence		-30	-20	-10	0	10	20	30
%c	%t/c							
0.0	0.00	-1.357	-0.775	-0.314	-0.125	-0.186	-0.657	-1.129
2.5	4.36	-1.643	-0.887	-0.443	-0.257	-0.371	-0.957	-1.514
5.0	5.93	-1.757	-0.789	-0.400	-0.389	-0.771	-1.414	-1.643
10.0	7.81	-1.357	-0.789	-0.371	-0.556	-0.814	-1.843	-1.771
20.0	9.57	-0.786	-0.577	-0.471	-0.556	-0.743	-1.657	-1.843
30.0	10.01	-0.429	-0.352	-0.343	-0.444	-0.629	-1.100	-1.843
40.0	9.68	-0.186	-0.155	-0.157	-0.208	-0.286	-0.571	-1.171
50.0	8.83	-0.029	-0.028	-0.129	-0.250	-0.443	-0.814	-1.771
60.0	7.61	0.114	0.099	-0.043	-0.208	-0.371	-0.829	-1.800
70.0	6.11	0.271	0.225	0.057	-0.125	-0.371	-0.814	-1.786
80.0	4.37	0.414	0.394	0.214	-0.042	-0.314	-1.086	-1.771
90.0	2.41	0.729	0.662	0.457	0.056	-0.229	-2.071	-1.714
95.0	1.35	0.943	0.901	0.686	0.181	-1.314	-2.043	-1.671
95.0	-1.35	-1.486	-2.014	-1.729	0.139	0.671	0.886	1.071
90.0	-2.41	-1.529	-2.042	-0.257	0.014	0.443	0.614	0.871
80.0	-4.37	-1.486	-0.986	-0.343	-0.111	0.200	0.329	0.557
70.0	-6.11	-1.614	-0.761	-0.400	-0.167	0.057	0.143	0.357
60.0	-7.61	-1.571	-0.746	-0.443	-0.250	-0.071	0.029	0.157
50.0	-8.83	-1.714	-0.775	-0.529	-0.306	-0.171	-0.129	-0.029
40.0	-9.68	-2.086	-0.859	-0.614	-0.403	-0.314	-0.271	-0.214
30.0	-10.01	-2.229	-1.113	-0.729	-0.542	-0.471	-0.514	-0.500
20.0	-9.57	-2.343	-1.662	-0.843	-0.667	-0.614	-0.757	-0.829

10.0	-7.81	-2.571	-2.268	-1.057	-0.694	-0.614	-1.157	-1.386
5.0	-5.93	-2.329	-2.183	-1.714	-0.597	-0.571	-1.471	-1.800
2.5	-4.36	-1.843	-1.254	-0.814	-0.389	-0.457	-1.057	-1.343

QUADRANT III -10m/s -1460rpm File: Qmm14p3.dat Span is : 0.97 m No: 8

Incidence		-30	-20	-10	0	10	20	30
%c	%t/c							
0.0	0.00	-1.441	-0.838	-0.353	-0.328	-0.235	-0.794	-1.162
2.5	4.36	-1.500	-0.824	-0.191	-0.537	-0.235	-0.809	-1.191
5.0	5.93	-1.912	-0.971	-0.382	-0.507	-1.250	-1.632	-1.721
10.0	7.81	-1.419	-0.971	-0.382	-0.433	-1.250	-1.632	-1.721
20.0	9.57	-0.926	-0.691	-0.324	-0.448	-1.206	-1.735	-1.971
30.0	10.01	-0.926	-0.691	-0.368	-0.403	-1.235	-1.765	-2.118
40.0	9.68	-0.382	-0.265	-0.176	-0.239	-0.426	-1.397	-1.647
50.0	8.83	-0.368	-0.294	-0.103	-0.179	-0.426	-1.397	-1.676
60.0	7.61	-0.191	-0.132	-0.074	-0.194	-0.456	-1.279	-1.985
70.0	6.11	-0.206	-0.162	-0.044	-0.134	-0.456	-1.265	-2.000
80.0	4.37	0.029	0.074	0.147	-0.060	-0.382	-1.015	-1.838
90.0	2.41	0.029	0.103	0.132	0.015	-0.382	-0.956	-1.838
95.0	1.35	0.647	0.618	0.574	0.134	-0.221	-1.985	-1.662
95.0	-1.35	0.618	0.588	-0.176	0.104	-0.206	-1.985	-1.691
90.0	-2.41	-1.559	-1.647	-0.324	0.015	0.279	0.353	0.618
80.0	-4.37	-1.544	-1.015	-0.353	-0.075	0.265	0.353	0.632
70.0	-6.11	-1.662	-0.794	-0.368	-0.164	-0.059	-0.044	0.088
60.0	-7.61	-1.485	-1.029	-0.426	-0.254	-0.015	-0.029	0.103
50.0	-8.83	-2.353	-1.618	-0.471	-0.343	-0.265	-0.250	-0.206
40.0	-9.68	-1.691	-1.632	-0.603	-0.433	-0.162	-0.235	-0.191
30.0	-10.01	-2.353	-1.691	-0.853	-0.537	-0.485	-0.574	-0.603
20.0	-9.57	-2.485	-1.721	-1.368	-0.687	-0.603	-0.779	-0.588
10.0	-7.81	-2.324	-1.971	-2.059	-0.851	-0.662	-1.132	-1.397
5.0	-5.93	-2.441	-1.838	-1.632	-0.866	-0.529	-0.912	-1.206
2.5	-4.36	-2.456	-1.397	-0.941	-0.955	-0.353	-1.162	-1.485

QUADRANT IV -10m/s +800rpm File: Qmp8p3.dat Span is : 0.07 m No: 1

Incidence		-30	-20	-10	0	10	20	30
%c	%t/c							
0.0	0.00	-0.542	-0.229	0.437	0.543	0.536	-0.145	-0.514
2.5	4.36	-0.458	-0.243	0.451	0.500	0.522	-0.116	-0.486
5.0	5.93	-0.458	-0.257	0.408	0.500	0.536	-0.232	-0.486
10.0	7.81	-0.542	-0.343	0.282	0.286	0.565	-0.101	-0.429
20.0	9.57	-0.333	-0.343	0.268	0.157	0.565	-0.188	-0.457
30.0	10.01	-0.014	-0.200	0.183	0.143	0.406	-0.159	-0.443
40.0	9.68	0.222	-0.029	0.197	0.100	0.275	-0.145	-0.514
50.0	8.83	0.417	0.143	0.268	0.100	0.159	-0.174	-0.486
60.0	7.61	0.597	0.314	0.352	0.114	0.087	-0.174	-0.543
70.0	6.11	0.792	0.471	0.437	0.171	0.043	-0.159	-0.514
80.0	4.37	0.958	0.671	0.577	0.243	0.014	-0.159	-0.500
90.0	2.41	1.125	0.871	0.803	0.357	-0.377	-0.116	-0.400
95.0	1.35	1.194	1.000	0.944	0.457	-0.986	-0.188	-0.443
95.0	-1.35	-0.347	-0.186	-0.775	0.243	0.899	1.043	1.257
90.0	-2.41	-0.375	-0.243	-0.761	0.229	0.710	0.884	1.143
80.0	-4.37	-0.389	-0.286	-0.296	0.157	0.478	0.681	0.929
70.0	-6.11	-0.458	-0.229	0.099	0.129	0.391	0.493	0.729
60.0	-7.61	-0.431	-0.214	0.113	0.029	0.217	0.261	0.500

50.0	-8.83	-0.375	-0.229	0.254	0.086	0.130	0.145	0.329
40.0	-9.68	-0.389	-0.243	0.324	0.114	0.072	-0.014	0.114
30.0	-10.01	-0.403	-0.171	0.366	0.214	0.014	-0.159	-0.143
20.0	-9.57	-0.403	-0.186	0.380	0.329	0.029	-0.290	-0.414
10.0	-7.81	-0.542	-0.371	0.380	0.529	0.029	-0.159	-0.386
5.0	-5.93	-0.500	-0.300	0.394	0.543	0.420	-0.261	-0.500
2.5	-4.36	-0.361	-0.114	0.479	0.357	0.522	-0.188	-0.329

QUADRANT IV -10m/s +800rpm File: Qmp8p3.dat Span is : 0.23 m No: 2

Incidence		-30	-20	-10	0	10	20	30
%c	%t/c							
0.0	0.00	-0.464	-0.250	0.412	0.652	0.544	-0.194	-0.485
2.5	4.36	-0.435	-0.250	0.426	0.712	0.559	-0.239	-0.574
5.0	5.93	-0.435	-0.206	0.441	0.697	0.544	-0.239	-0.544
10.0	7.81	-0.522	-0.250	0.368	0.561	0.588	-0.179	-0.529
20.0	9.57	-0.319	-0.221	0.250	0.227	0.588	-0.209	-0.515
30.0	10.01	-0.043	-0.118	0.206	0.212	0.485	-0.284	-0.471
40.0	9.68	0.203	0.074	0.206	0.136	0.382	-0.313	-0.515
50.0	8.83	0.449	0.221	0.250	0.152	0.279	-0.254	-0.500
60.0	7.61	0.652	0.397	0.324	0.167	0.176	-0.224	-0.500
70.0	6.11	0.826	0.574	0.426	0.197	0.147	-0.209	-0.485
80.0	4.37	1.000	0.779	0.603	0.288	-0.074	-0.209	-0.485
90.0	2.41	1.203	0.985	0.794	0.379	-0.632	-0.149	-0.500
95.0	1.35	1.304	1.176	0.985	0.530	-0.721	-0.209	-0.471
95.0	-1.35	-0.333	-0.132	-0.485	0.455	0.956	1.149	1.309
90.0	-2.41	-0.362	-0.103	-0.588	0.318	0.765	0.985	1.162
80.0	-4.37	-0.377	-0.250	-0.456	0.273	0.515	0.701	0.956
70.0	-6.11	-0.377	-0.103	-0.059	0.197	0.324	0.537	0.735
60.0	-7.61	-0.420	-0.132	0.176	0.167	0.235	0.313	0.544
50.0	-8.83	-0.435	-0.176	0.235	0.182	0.162	0.149	0.294
40.0	-9.68	-0.391	-0.162	0.338	0.227	0.059	-0.030	0.074
30.0	-10.01	-0.449	-0.235	0.426	0.227	0.015	-0.224	-0.162
20.0	-9.57	-0.449	-0.191	0.456	0.439	0.029	-0.328	-0.456
10.0	-7.81	-0.522	-0.265	0.544	0.652	0.059	-0.075	-0.632
5.0	-5.93	-0.478	-0.294	0.426	0.667	0.456	-0.239	-0.456
2.5	-4.36	-0.333	-0.221	0.221	0.621	0.485	-0.224	-0.691

QUADRANT IV -10m/s +800rpm File: Qmp8p3.dat Span is : 0.40 m No: 3

Incidence		-30	-20	-10	0	10	20	30
%c	%t/c							
0.0	0.00	-0.535	-0.314	0.408	0.739	0.652	-0.221	-0.478
2.5	4.36	-0.549	-0.314	0.423	0.754	0.609	-0.309	-0.536
5.0	5.93	-0.549	-0.171	0.366	0.783	0.565	-0.191	-0.609
10.0	7.81	-0.549	-0.329	0.394	0.768	0.580	-0.103	-0.478
20.0	9.57	-0.282	-0.200	0.211	0.507	0.594	-0.250	-0.464
30.0	10.01	-0.056	-0.086	0.211	0.290	0.551	-0.250	-0.493
40.0	9.68	0.155	0.043	0.169	0.188	0.464	-0.353	-0.536
50.0	8.83	0.352	0.200	0.225	0.159	0.319	-0.294	-0.536
60.0	7.61	0.563	0.371	0.282	0.145	0.203	-0.309	-0.507
70.0	6.11	0.746	0.514	0.352	0.130	0.130	-0.250	-0.478
80.0	4.37	0.930	0.700	0.521	0.203	-0.203	-0.132	-0.478
90.0	2.41	1.141	0.943	0.732	0.319	-0.623	-0.176	-0.449
95.0	1.35	1.225	1.100	0.901	0.420	-0.681	-0.132	-0.464
95.0	-1.35	-0.394	-0.086	-0.577	0.348	0.841	1.015	1.145

90.0	-2.41	-0.394	-0.129	-0.592	0.261	0.739	0.956	1.203
80.0	-4.37	-0.437	-0.143	-0.451	0.174	0.507	0.691	0.971
70.0	-6.11	-0.437	-0.171	-0.042	0.130	0.362	0.500	0.754
60.0	-7.61	-0.437	-0.229	0.169	0.101	0.246	0.324	0.565
50.0	-8.83	-0.451	-0.229	0.268	0.101	0.145	0.147	0.333
40.0	-9.68	-0.437	-0.329	0.352	0.116	0.072	0.000	0.101
30.0	-10.01	-0.479	-0.286	0.408	0.188	0.029	-0.206	-0.174
20.0	-9.57	-0.479	-0.229	0.479	0.319	0.029	-0.309	-0.420
10.0	-7.81	-0.549	-0.386	0.408	0.551	0.203	-0.338	-0.594
5.0	-5.93	-0.549	-0.386	0.423	0.652	0.536	-0.250	-0.478
2.5	-4.36	-0.535	-0.443	0.465	0.667	0.580	-0.265	-0.580

QUADRANT IV -10m/s +800rpm File: Qmp8p3.dat Span is : 0.53 m No: 4

Incidence		-30	-20	-10	0	10	20	30
%c	%t/c							
0.0	0.00	-0.434	-0.360	0.537	0.866	0.566	-0.184	-0.530
2.5	4.36	-0.412	-0.250	0.574	0.866	0.574	-0.206	-0.582
5.0	5.93	-0.382	-0.250	0.485	0.866	0.647	-0.103	-0.507
10.0	7.81	-0.456	-0.221	0.368	0.821	0.603	-0.103	-0.493
20.0	9.57	-0.250	-0.088	0.279	0.567	0.618	-0.118	-0.403
30.0	10.01	-0.044	-0.044	0.206	0.343	0.588	-0.279	-0.493
40.0	9.68	0.191	0.074	0.206	0.254	0.500	-0.368	-0.627
50.0	8.83	0.382	0.235	0.221	0.179	0.382	-0.368	-0.567
60.0	7.61	0.559	0.382	0.309	0.164	0.279	-0.353	-0.582
70.0	6.11	0.706	0.529	0.382	0.179	0.147	-0.338	-0.522
80.0	4.37	0.926	0.721	0.529	0.239	-0.206	-0.265	-0.522
90.0	2.41	1.132	0.941	0.735	0.328	-0.603	-0.191	-0.478
95.0	1.35	1.235	1.132	0.926	0.433	-0.618	-0.103	-0.507
95.0	-1.35	-0.397	-0.118	-0.588	0.418	0.853	1.015	1.119
90.0	-2.41	-0.382	-0.059	-0.603	0.358	0.779	0.956	1.179
80.0	-4.37	-0.471	-0.162	-0.324	0.254	0.529	0.706	0.940
70.0	-6.11	-0.456	-0.103	0.044	0.209	0.412	0.500	0.746
60.0	-7.61	-0.485	-0.162	0.235	0.194	0.294	0.353	0.552
50.0	-8.83	-0.471	-0.279	0.338	0.194	0.206	0.176	0.343
40.0	-9.68	-0.426	-0.221	0.426	0.224	0.132	0.029	0.090
30.0	-10.01	-0.368	-0.294	0.544	0.299	0.103	-0.118	-0.164
20.0	-9.57	-0.368	-0.088	0.559	0.403	0.103	-0.176	-0.373
10.0	-7.81	-0.426	-0.162	0.529	0.776	0.191	-0.279	-0.567
5.0	-5.93	-0.529	-0.265	0.500	0.806	0.397	-0.250	-0.507
2.5	-4.36	-0.456	-0.471	0.500	0.821	0.559	-0.162	-0.478

QUADRANT IV -10m/s +800rpm File: Qmp8p3.dat Span is : 0.70 m No: 5

Incidence		-30	-20	-10	0	10	20	30
%c	%t/c							
0.0	0.00	-0.085	0.028	0.706	0.791	0.739	-0.044	-0.435
2.5	4.36	0.042	0.127	0.853	0.910	0.696	-0.074	-0.290
5.0	5.93	0.056	0.282	1.000	1.015	0.986	-0.059	-0.116
10.0	7.81	0.169	0.606	1.059	1.149	1.072	0.235	-0.014
20.0	9.57	0.479	0.746	1.000	1.209	1.203	0.426	0.159
30.0	10.01	0.845	0.958	1.029	1.075	1.261	0.603	0.203
40.0	9.68	1.155	1.239	1.029	1.090	1.319	0.544	0.420
50.0	8.83	1.254	1.380	1.103	1.090	1.319	0.574	0.406
60.0	7.61	1.310	1.352	0.985	0.836	1.014	0.147	0.145
70.0	6.11	0.845	0.845	0.691	0.358	0.522	0.088	0.130

80.0	4.37	1.113	1.056	0.721	0.358	0.043	-0.118	-0.304
90.0	2.41	1.268	1.282	0.838	0.388	-0.362	-0.029	-0.333
95.0	1.35	1.408	1.408	1.015	0.433	-0.435	-0.044	-0.261
95.0	-1.35	-0.141	0.282	-0.338	0.507	1.116	1.235	1.478
90.0	-2.41	-0.113	0.296	-0.250	0.403	0.971	1.029	1.449
80.0	-4.37	0.042	0.423	0.221	0.418	0.870	0.882	1.319
70.0	-6.11	-0.014	0.493	0.588	0.448	0.826	0.824	1.145
60.0	-7.61	0.155	0.408	0.794	0.537	0.754	0.765	1.058
50.0	-8.83	0.225	0.592	0.956	0.627	0.783	0.765	1.000
40.0	-9.68	0.394	0.690	1.176	0.791	0.884	0.706	0.870
30.0	-10.01	0.521	0.803	1.118	0.866	0.899	0.544	0.638
20.0	-9.57	0.563	0.732	1.279	1.015	1.000	0.529	0.478
10.0	-7.81	0.408	0.718	1.324	1.224	1.101	0.368	0.261
5.0	-5.93	0.225	0.535	1.265	1.164	1.174	0.176	0.261
2.5	-4.36	0.141	0.451	1.118	0.977	1.043	0.176	0.014

QUADRANT IV -10m/s +800rpm File: Qmp8p3.dat Span is : 0.83 m No: 6

Incidence		-30	-20	-10	0	10	20	30
%c	%t/c							
0.0	0.00	-0.257	0.029	0.647	0.840	0.652	-0.014	-0.471
2.5	4.36	-0.300	0.294	0.662	0.900	0.783	-0.157	-0.371
5.0	5.93	-0.129	0.279	0.824	0.980	0.797	0.029	-0.457
10.0	7.81	-0.129	0.309	0.838	1.060	0.942	0.314	-0.243
20.0	9.57	0.186	0.426	0.765	0.940	1.043	0.343	0.000
30.0	10.01	0.529	0.544	0.926	0.760	1.130	0.400	0.129
40.0	9.68	0.829	0.765	0.971	0.800	1.101	0.386	0.214
50.0	8.83	0.971	0.956	0.912	0.840	1.072	0.314	0.086
60.0	7.61	0.900	0.809	0.706	0.600	0.725	0.243	0.129
70.0	6.11	0.400	0.412	0.368	0.000	0.319	0.086	0.114
80.0	4.37	0.914	0.750	0.588	0.000	0.087	-0.343	-0.414
90.0	2.41	0.943	0.779	0.691	0.060	-0.217	0.029	-0.414
95.0	1.35	1.214	1.118	0.971	0.240	-0.551	-0.071	-0.314
95.0	-1.35	-0.286	-0.029	-0.500	0.340	0.986	1.157	1.314
90.0	-2.41	-0.229	0.103	-0.397	0.300	0.826	1.086	1.229
80.0	-4.37	-0.243	0.147	0.250	0.320	0.797	0.886	1.086
70.0	-6.11	-0.243	0.147	0.515	0.340	0.696	0.771	0.971
60.0	-7.61	-0.243	0.118	0.632	0.380	0.638	0.657	0.900
50.0	-8.83	0.000	0.176	0.809	0.500	0.681	0.671	0.771
40.0	-9.68	0.157	0.265	0.971	0.740	0.667	0.657	0.671
30.0	-10.01	0.200	0.397	1.147	0.840	0.652	0.543	0.543
20.0	-9.57	0.271	0.618	1.162	1.120	0.739	0.414	0.300
10.0	-7.81	0.186	0.721	1.044	1.480	0.812	0.300	-0.057
5.0	-5.93	0.457	0.912	0.471	0.060	0.522	0.600	0.557
2.5	-4.36	0.000	0.529	0.868	1.260	0.957	0.286	-0.043

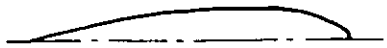
QUADRANT IV -10m/s +800rpm File: Qmp8p3.dat Span is : 0.94 m No: 7

Incidence		-30	-20	-10	0	10	20	30
%c	%t/c							
0.0	0.00	-0.338	-0.056	0.361	0.471	0.397	-0.145	-0.565
2.5	4.36	-0.378	-0.028	0.597	0.629	0.452	-0.203	-0.725
5.0	5.93	-0.311	-0.085	0.597	0.671	0.493	-0.188	-0.638
10.0	7.81	-0.365	-0.169	0.500	0.643	0.548	0.072	-0.464
20.0	9.57	-0.216	-0.197	0.347	0.443	0.534	-0.116	-0.522
30.0	10.01	-0.054	-0.113	0.278	0.300	0.548	-0.188	-0.435

40.0	9.68	0.041	-0.042	0.208	0.143	0.342	-0.188	-0.420
50.0	8.83	0.257	0.070	0.250	0.171	0.315	-0.420	-0.681
60.0	7.61	0.392	0.169	0.278	0.129	0.192	-0.304	-0.652
70.0	6.11	0.500	0.268	0.306	0.129	0.137	-0.478	-0.667
80.0	4.37	0.662	0.423	0.417	0.171	0.096	-0.348	-0.522
90.0	2.41	0.865	0.648	0.542	0.243	-0.164	-0.478	-0.449
95.0	1.35	1.014	0.831	0.708	0.314	-0.795	-0.638	-0.435
95.0	-1.35	-0.351	-0.324	-0.764	0.343	0.726	0.957	1.101
90.0	-2.41	-0.351	-0.282	-0.194	0.257	0.534	0.725	0.899
80.0	-4.37	-0.432	-0.338	0.097	0.186	0.356	0.464	0.667
70.0	-6.11	-0.500	-0.380	0.125	0.157	0.247	0.333	0.493
60.0	-7.61	-0.581	-0.324	0.181	0.114	0.178	0.217	0.348
50.0	-8.83	-0.473	-0.324	0.264	0.114	0.164	0.116	0.217
40.0	-9.68	-0.459	-0.310	0.361	0.157	0.137	0.014	0.043
30.0	-10.01	-0.365	-0.310	0.486	0.243	0.123	-0.174	-0.203
20.0	-9.57	-0.378	-0.254	0.556	0.386	0.151	-0.159	-0.420
10.0	-7.81	-0.419	-0.085	0.569	0.629	0.288	-0.290	-0.667
5.0	-5.93	-0.473	-0.183	0.556	0.671	0.411	-0.275	-0.638
2.5	-4.36	-0.378	-0.099	0.500	0.671	0.507	-0.261	-0.623

QUADRANT IV -10m/s +800rpm File: Qmp8p3.dat Span is : 0.97 m No: 8

Incidence		-30	-20	-10	0	10	20	30
%c	%t/c							
0.0	0.00	-0.423	-0.101	0.391	0.574	0.377	-0.145	-0.529
2.5	4.36	-0.507	-0.087	0.493	0.706	0.493	-0.232	-0.614
5.0	5.93	-0.380	-0.116	0.507	0.735	0.507	-0.203	-0.614
10.0	7.81	-0.394	-0.159	0.507	0.691	0.493	-0.116	-0.614
20.0	9.57	-0.268	-0.130	0.290	0.397	0.536	-0.174	-0.543
30.0	10.01	-0.113	-0.087	0.232	0.279	0.493	-0.275	-0.471
40.0	9.68	-0.028	-0.029	0.174	0.176	0.319	-0.275	-0.543
50.0	8.83	0.127	0.101	0.130	0.147	0.246	-0.348	-0.657
60.0	7.61	0.239	0.174	0.145	0.118	0.188	-0.362	-0.571
70.0	6.11	0.338	0.261	0.174	0.103	0.116	-0.319	-0.486
80.0	4.37	0.479	0.391	0.246	0.118	0.043	-0.319	-0.557
90.0	2.41	0.718	0.580	0.391	0.162	0.014	-0.159	-0.443
95.0	1.35	0.901	0.797	0.580	0.265	-0.565	-0.348	-0.414
95.0	-1.35	-0.380	-0.174	-0.507	0.265	0.580	0.826	0.929
90.0	-2.41	-0.352	-0.145	0.043	0.206	0.377	0.623	0.757
80.0	-4.37	-0.437	-0.130	0.072	0.118	0.246	0.377	0.514
70.0	-6.11	-0.451	-0.333	0.101	0.118	0.174	0.246	0.371
60.0	-7.61	-0.549	-0.217	0.174	0.118	0.130	0.145	0.257
50.0	-8.83	-0.479	-0.304	0.246	0.132	0.130	0.043	0.114
40.0	-9.68	-0.493	-0.333	0.333	0.191	0.130	-0.072	-0.043
30.0	-10.01	-0.437	-0.275	0.478	0.250	0.130	-0.203	-0.229
20.0	-9.57	-0.338	-0.130	0.536	0.309	0.217	-0.188	-0.371
10.0	-7.81	-0.423	0.000	0.551	0.706	0.377	-0.319	-0.643
5.0	-5.93	-0.437	-0.014	0.551	0.765	0.449	-0.275	-0.786
2.5	-4.36	-0.437	-0.116	0.478	0.779	0.507	-0.261	-0.700



SECTION: NACA 0020 For All Rudders

Chordwise position of tappings (%c from L.E.):
0, 2.5, 5, 10, 20, 30, 40, 50, 60, 70, 80, 90, 95

All dimensions in mm

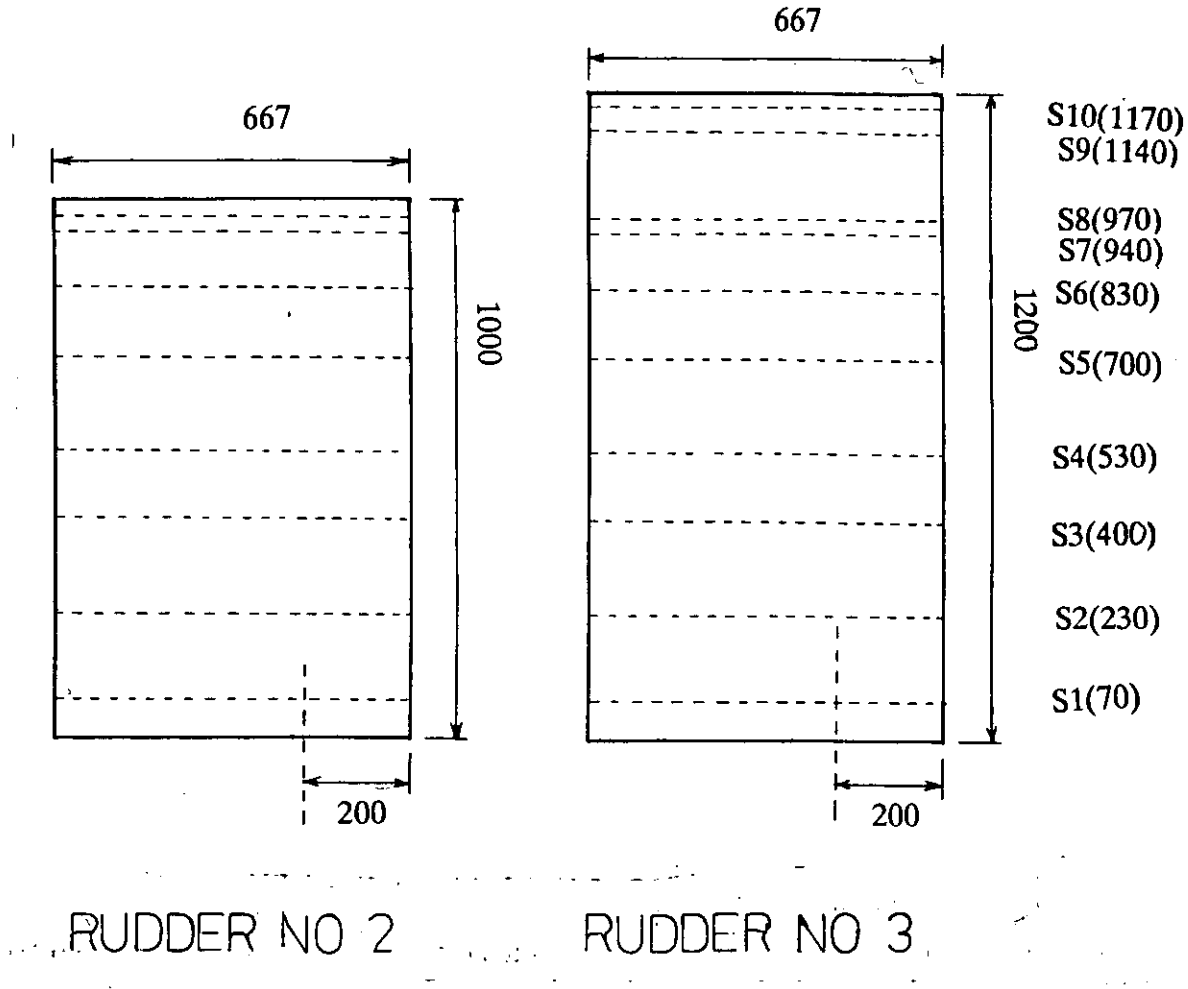


Figure 1 Overall dimensions of rudder models

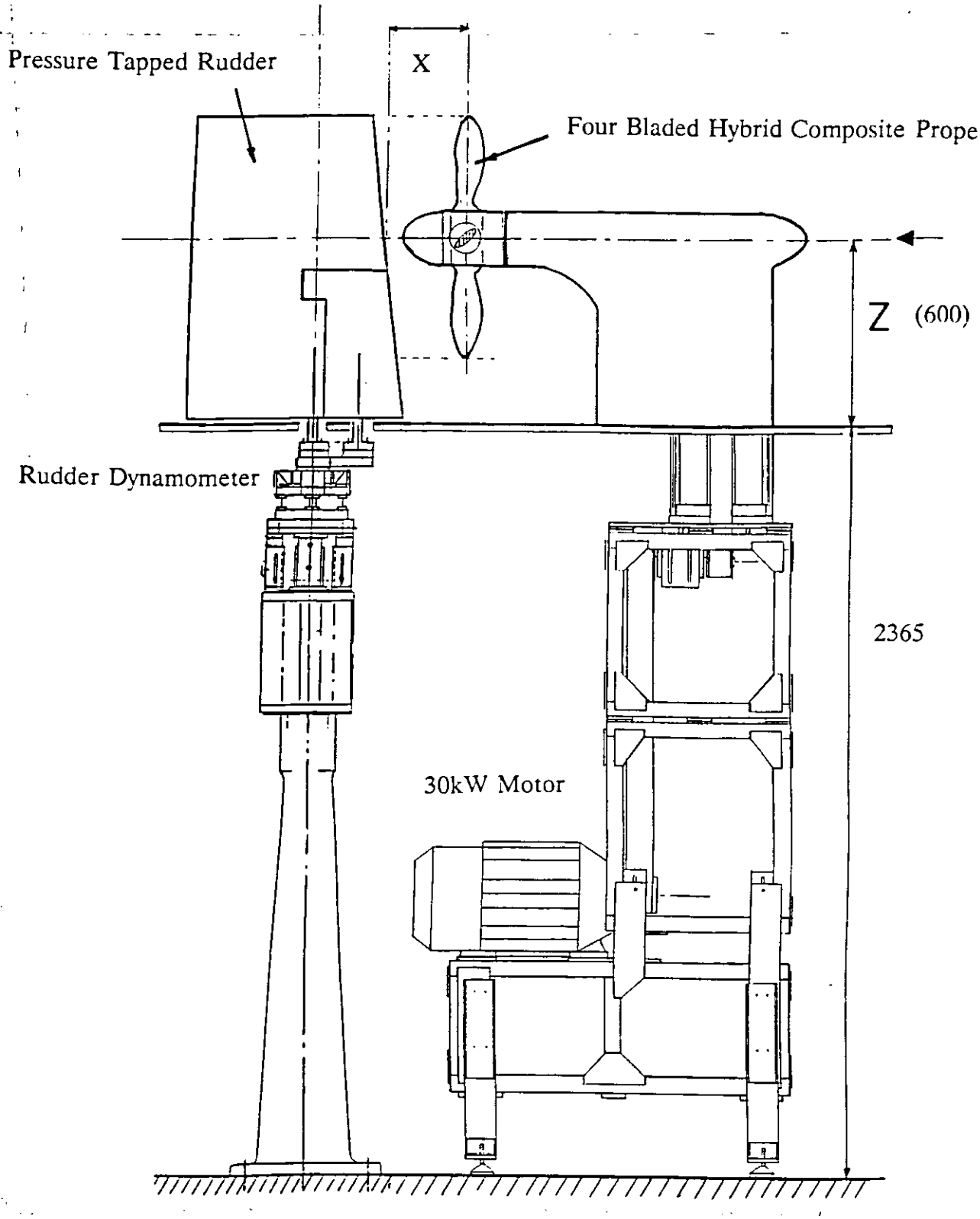


Figure 2 Side view of overall rudder and propeller rigs All dimensions in mm

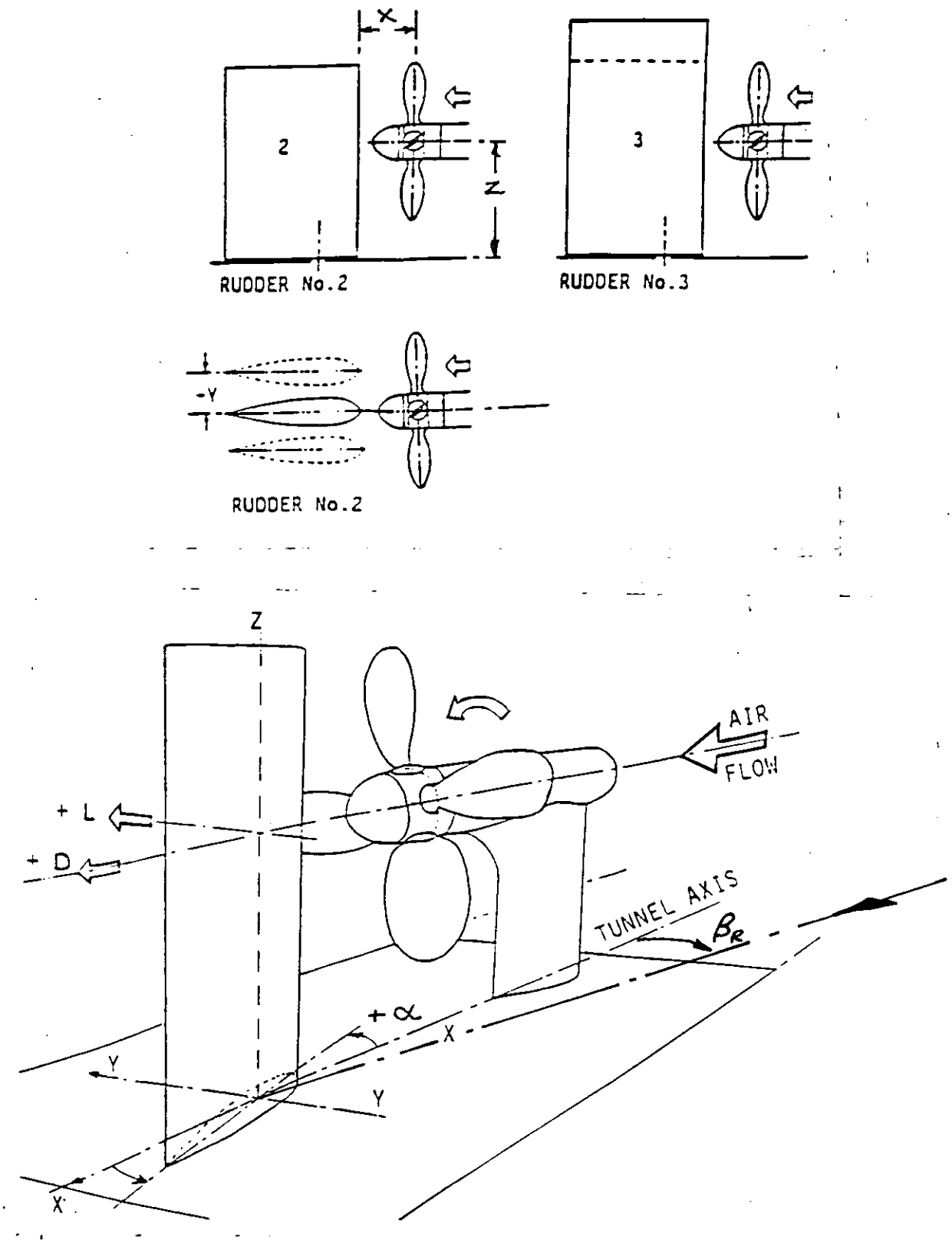


Figure 3 Schematic view of rudder-propeller models

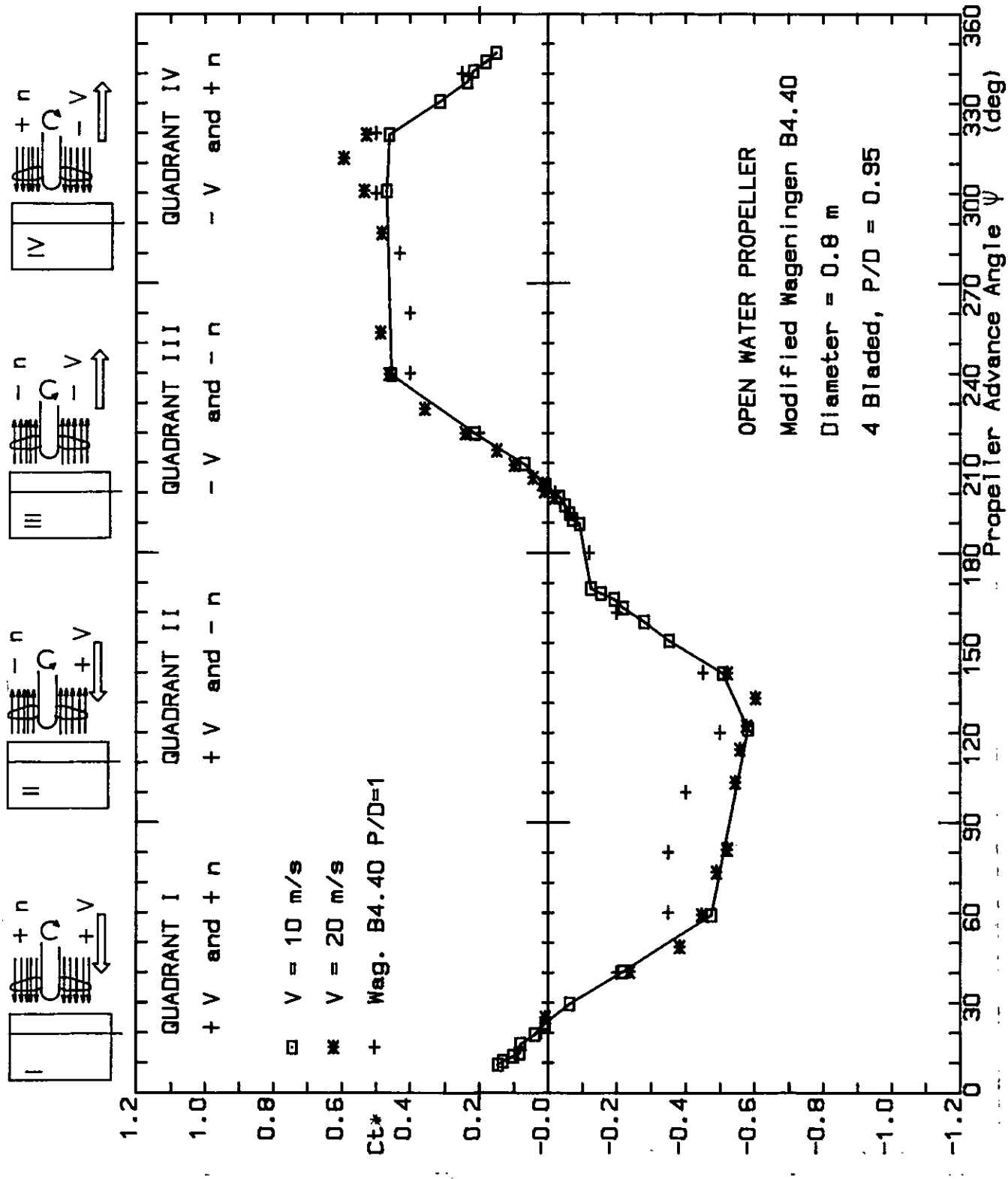


Figure 4 Four quadrant openwater performance of propeller thrust C_T*

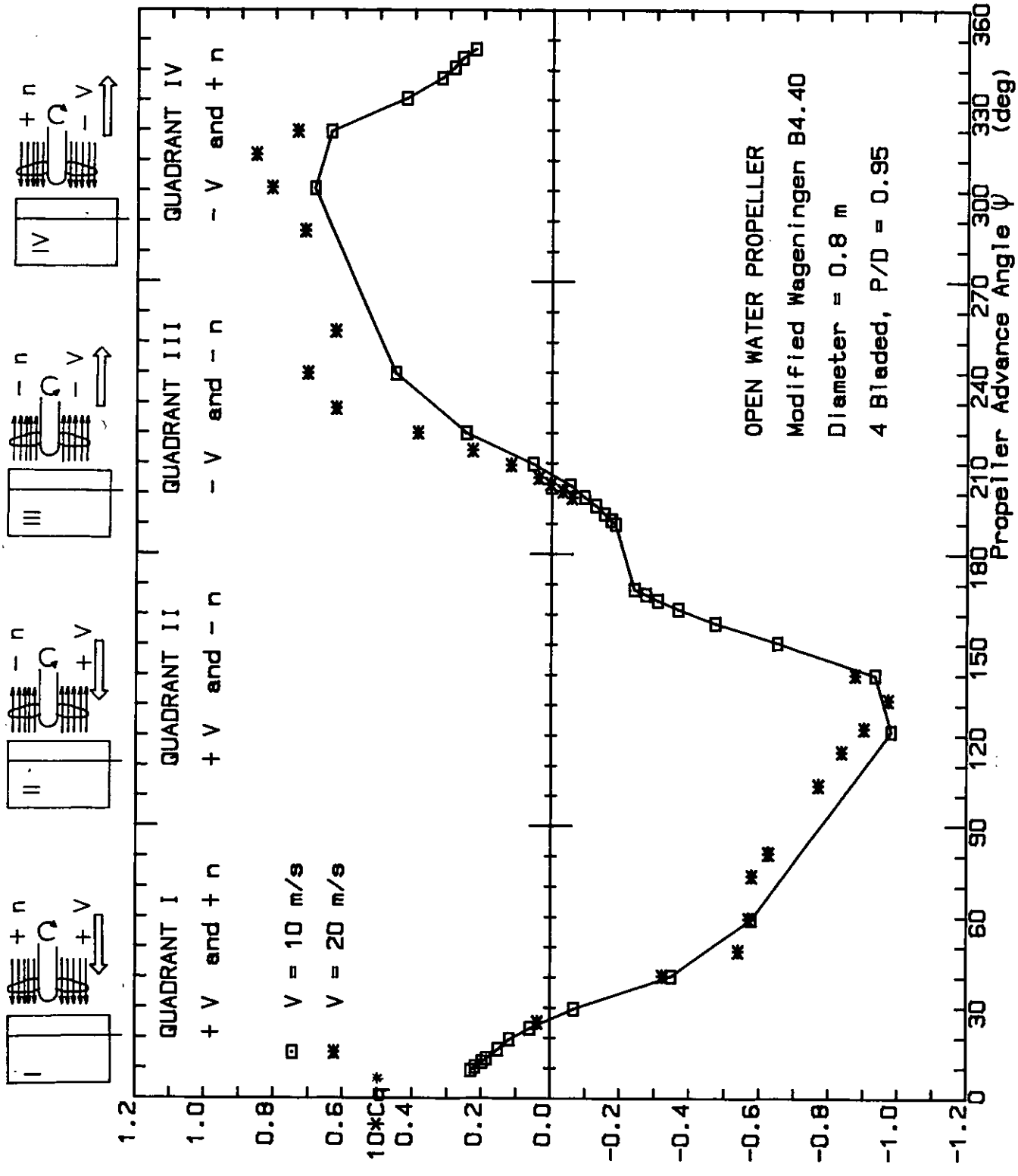


Figure 5 Four quadrant openwater performance of propeller torque C_Q*

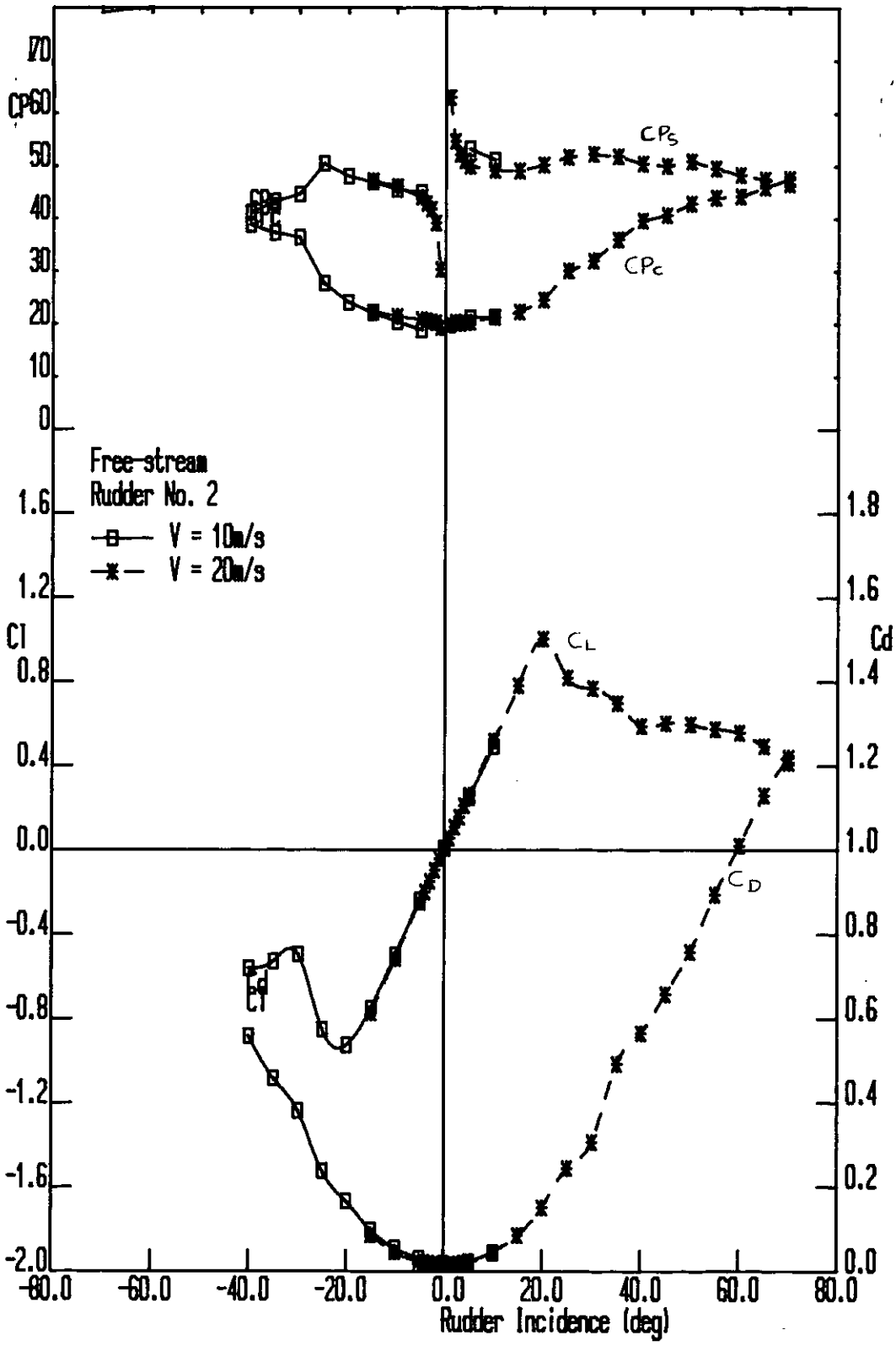


Figure 6 Free-stream performance of Rudder No. 2

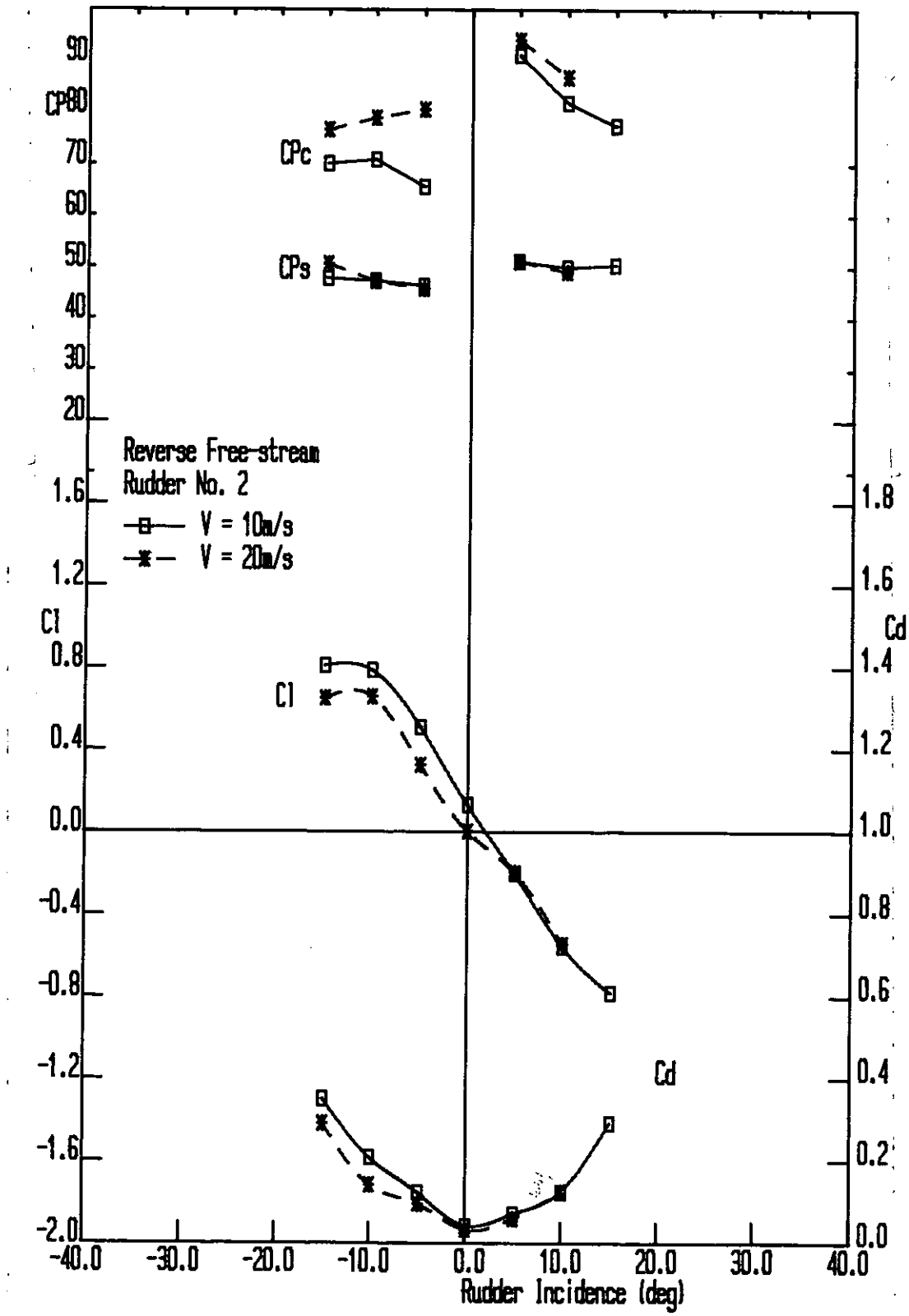


Figure 7 Reverse flow free-stream performance of Rudder No. 2

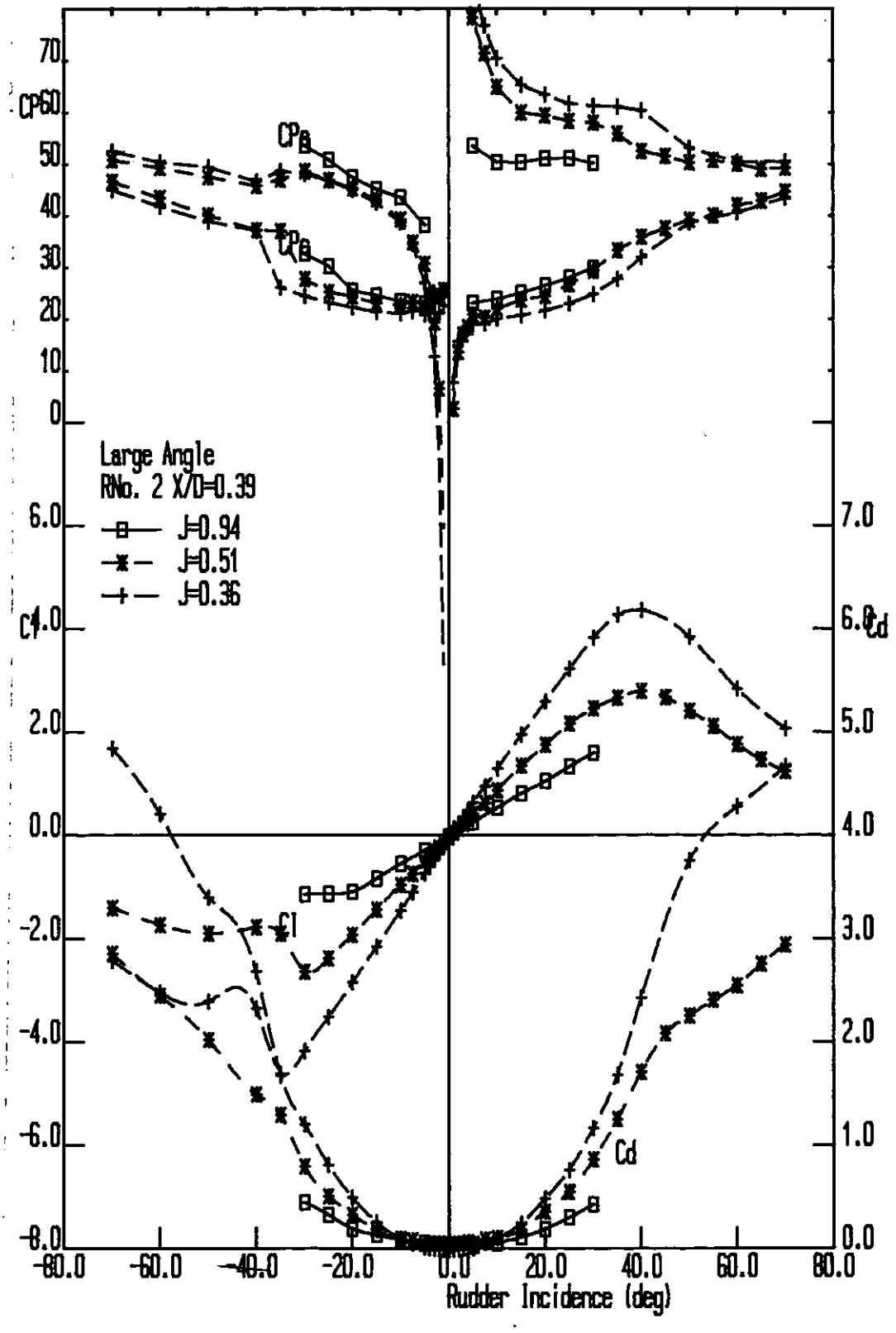


Figure 8 Influence of propeller thrust loading on the performance of Rudder No. 2 at large angles of incidence

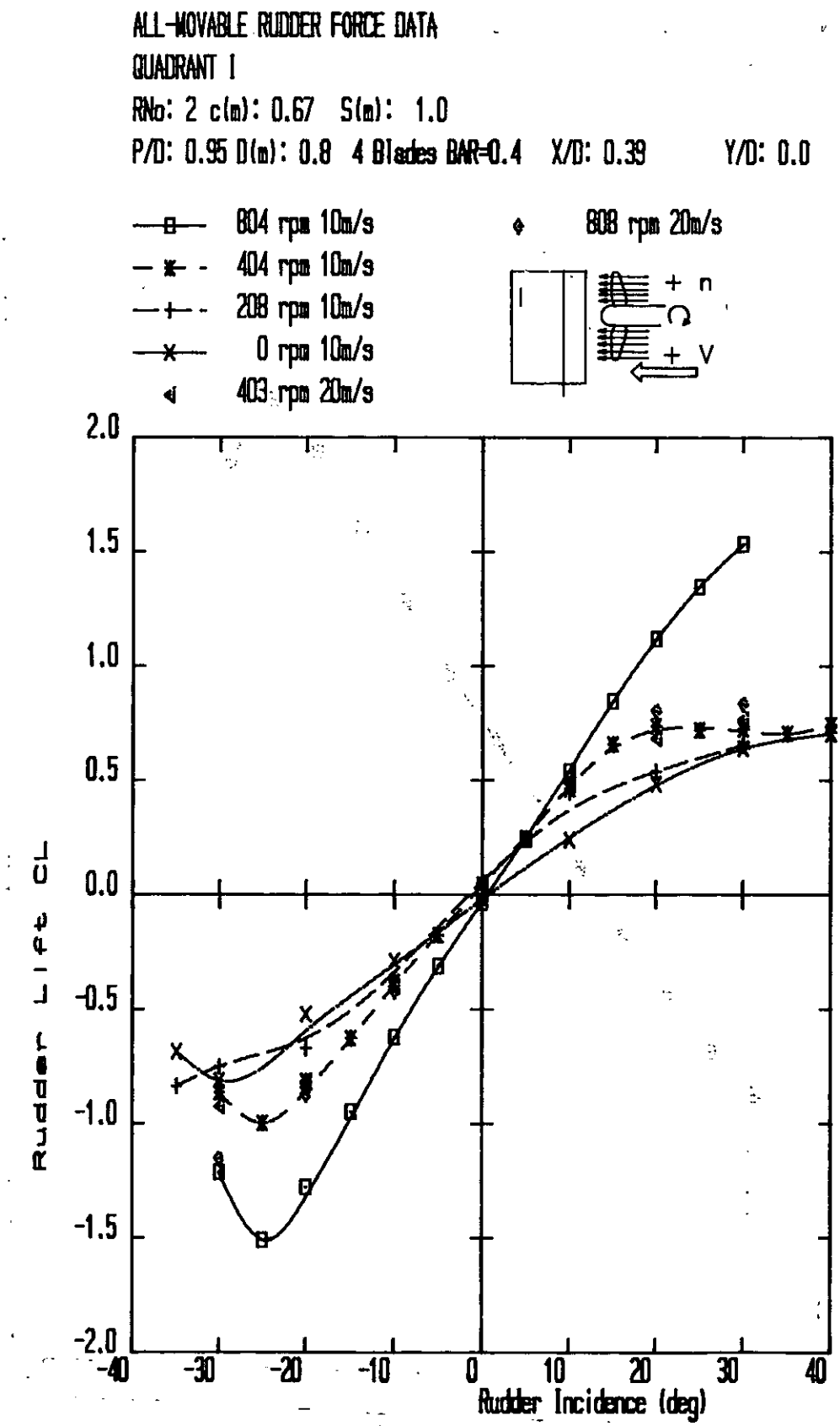


Figure 9 The influence of propeller advance angle on rudder sideforce C_L for all four quadrants of operation QUADRANT I

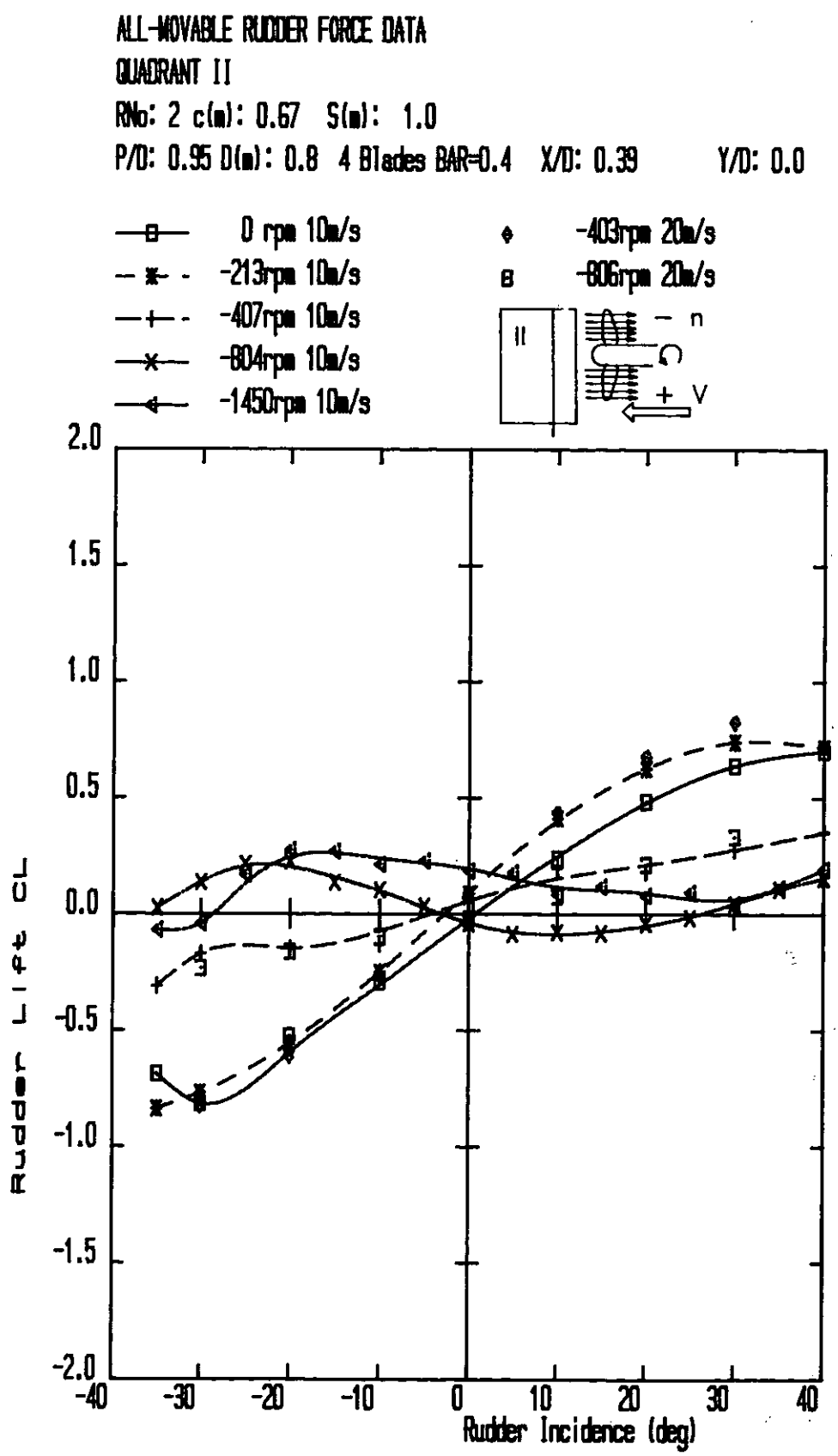


Figure 9 The influence of propeller advance angle on rudder sideforce C_L for all four quadrants of operation QUADRANT II

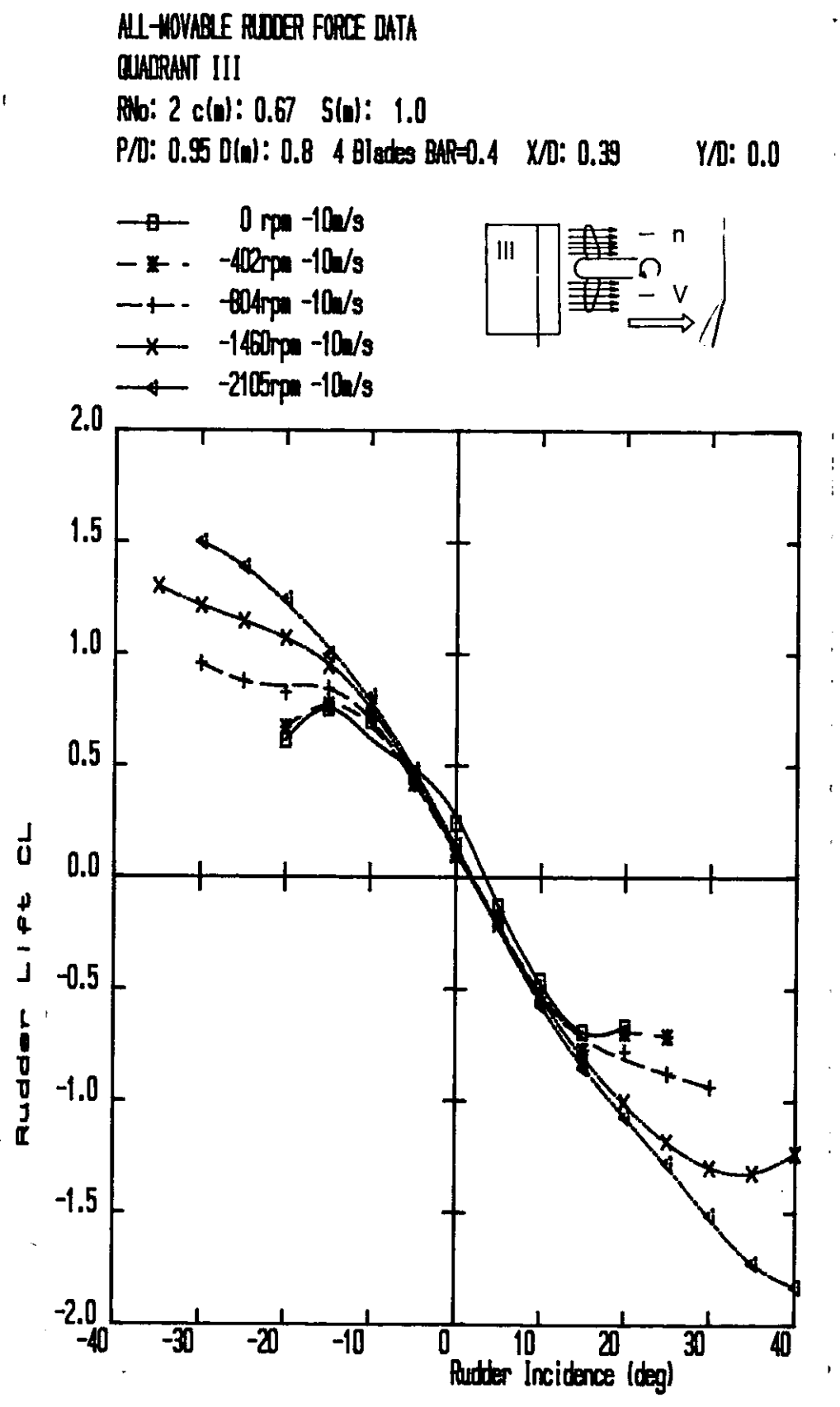


Figure 9 The influence of propeller advance angle on rudder sideforce C_L for all four quadrants of operation QUADRANT III

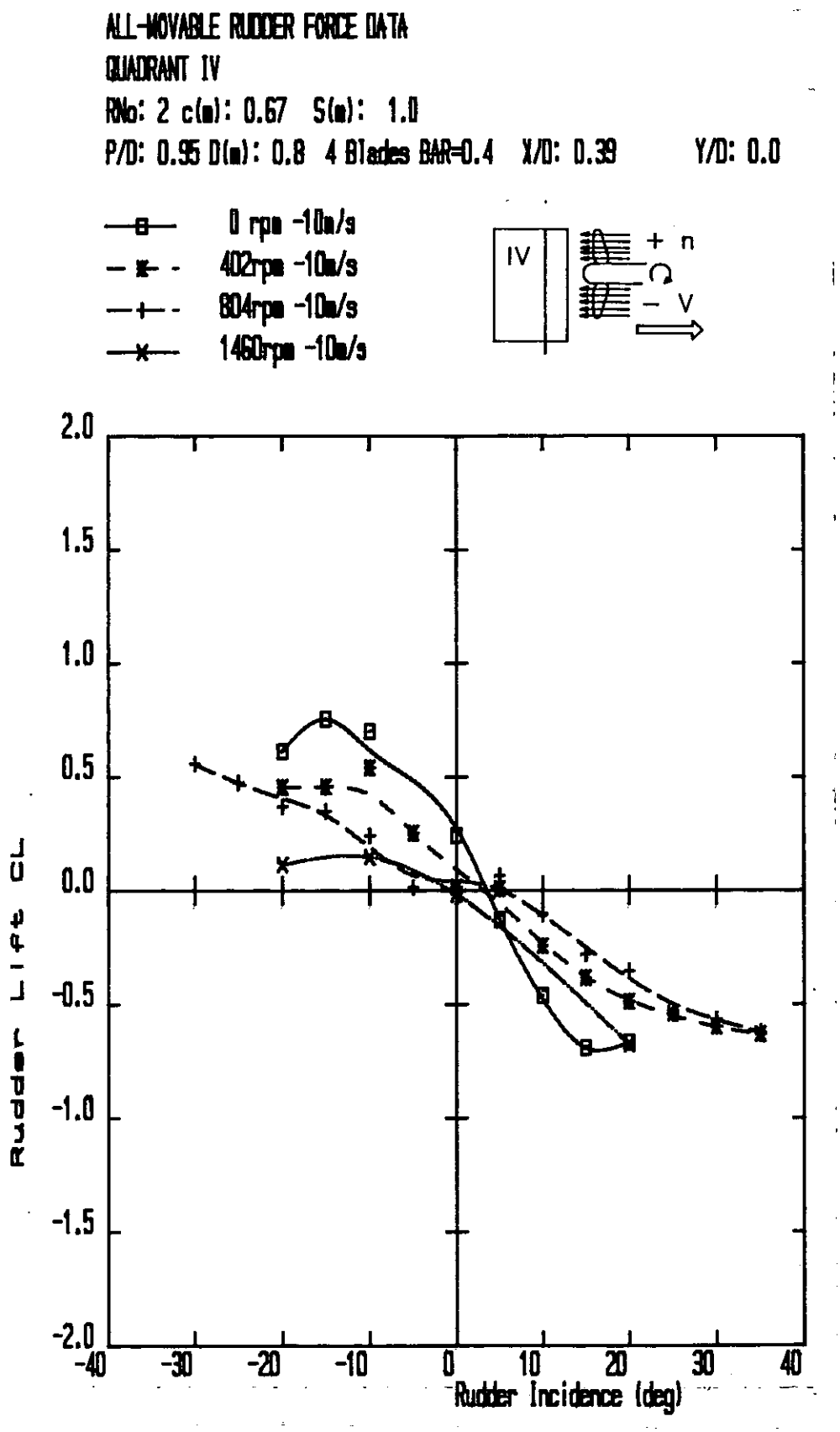


Figure 9 The influence of propeller advance angle on rudder sideforce C_L for all four quadrants of operation QUADRANT IV

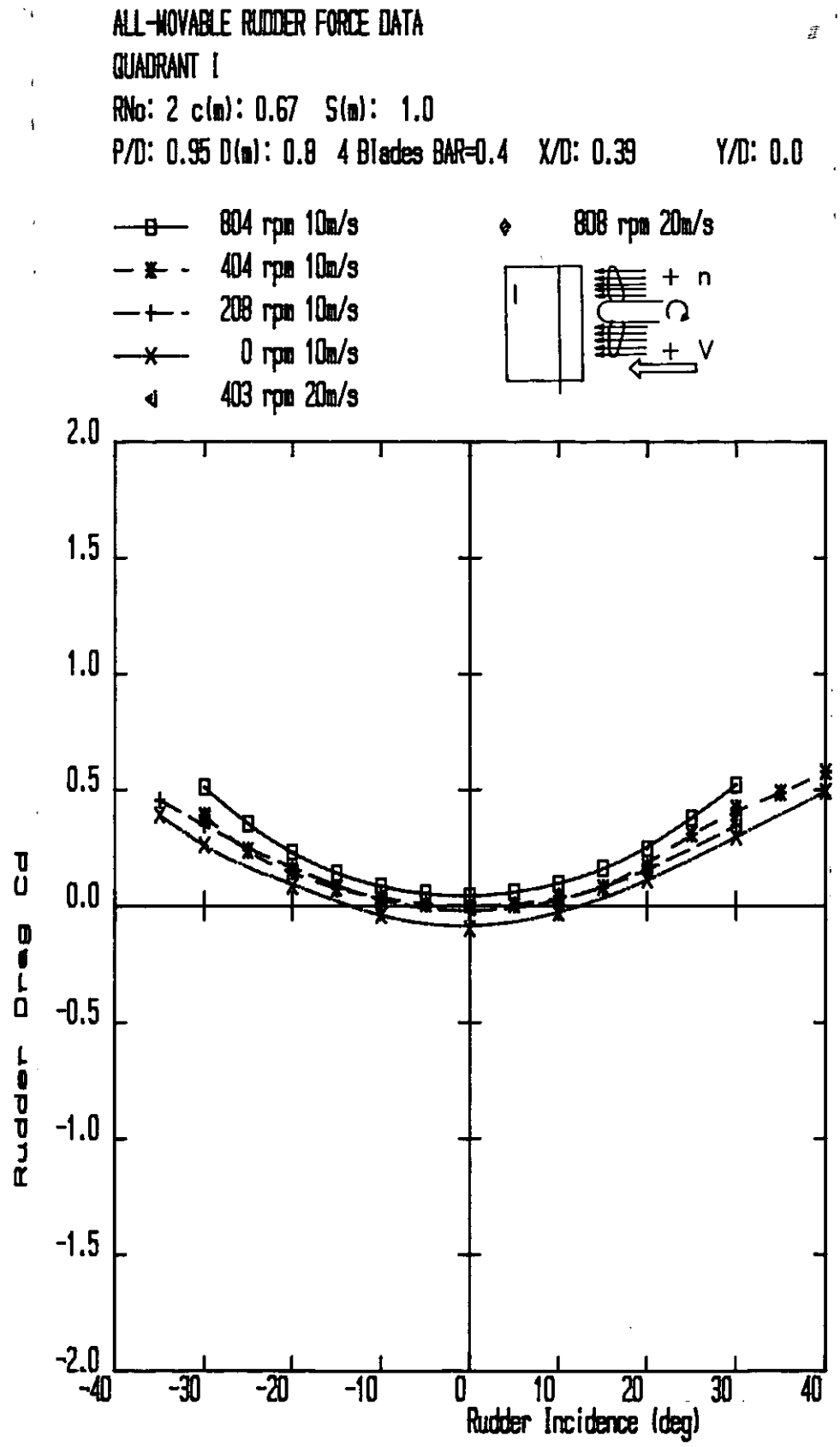


Figure 10 The influence of propeller advance angle on rudder drag C_D for all four quadrants of operation QUADRANT I

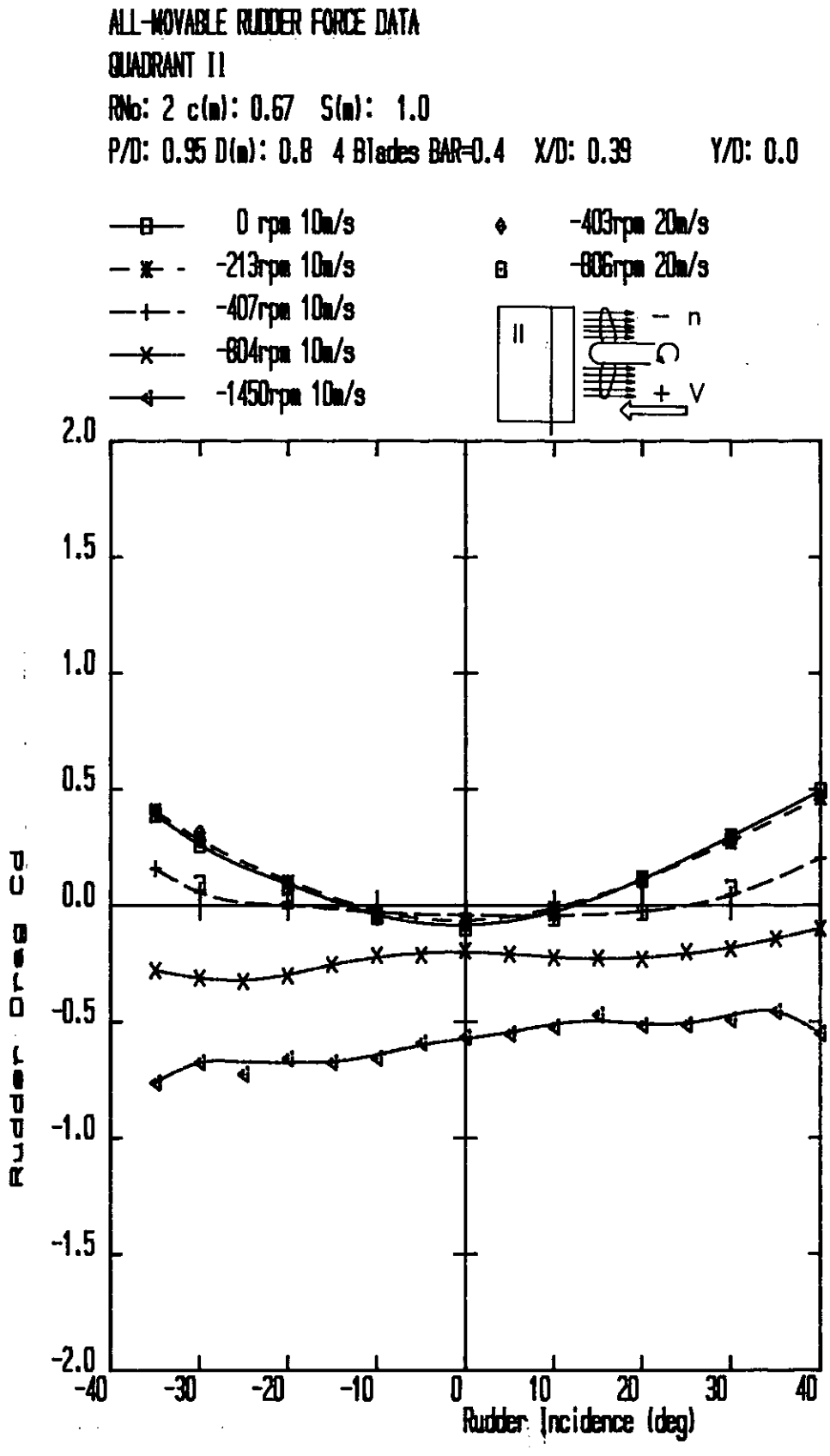


Figure 10 The influence of propeller advance angle on rudder drag C_D for all four quadrants of operation QUADRANT II

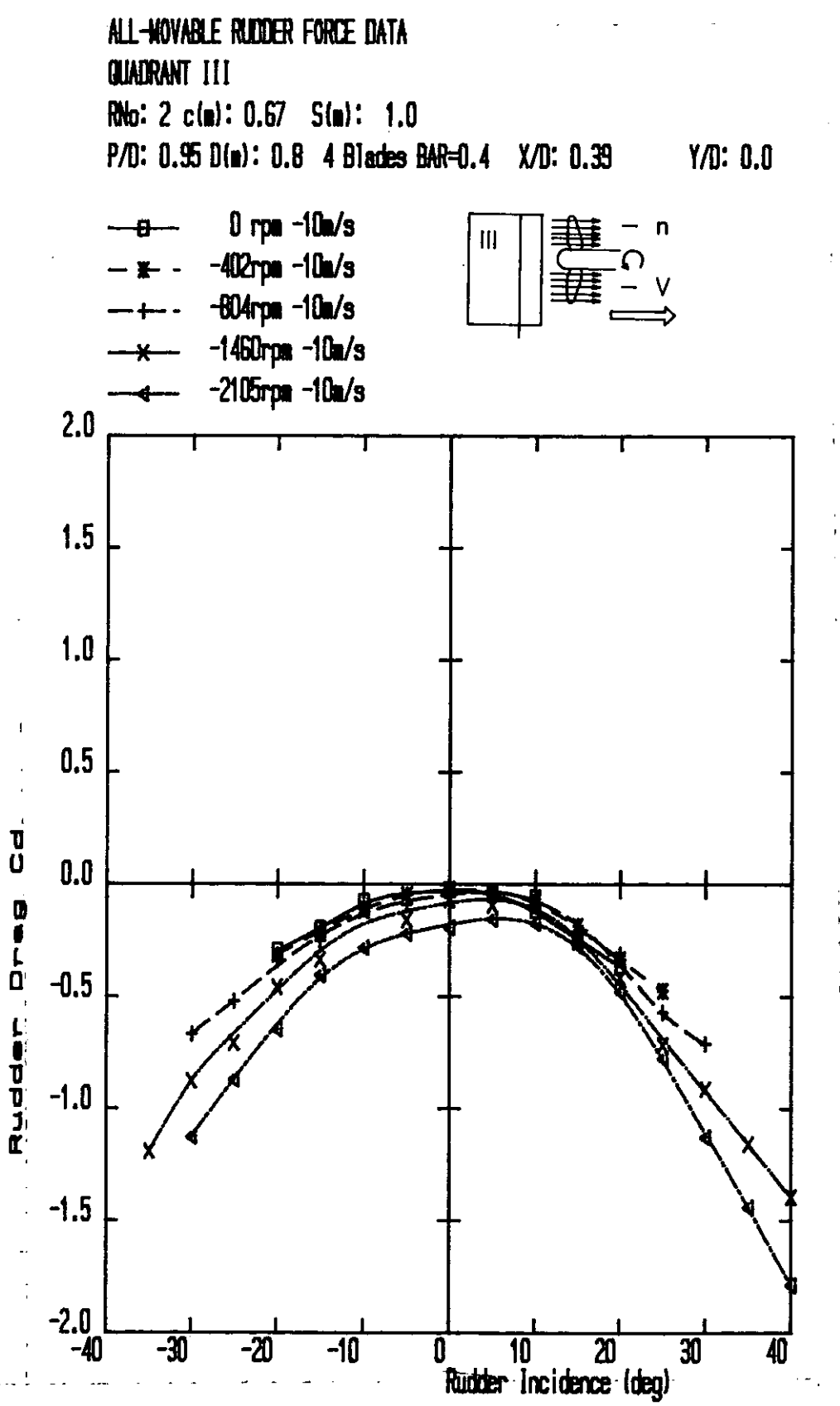


Figure 10 The influence of propeller advance angle on rudder drag C_D for all four quadrants of operation QUADRANT III

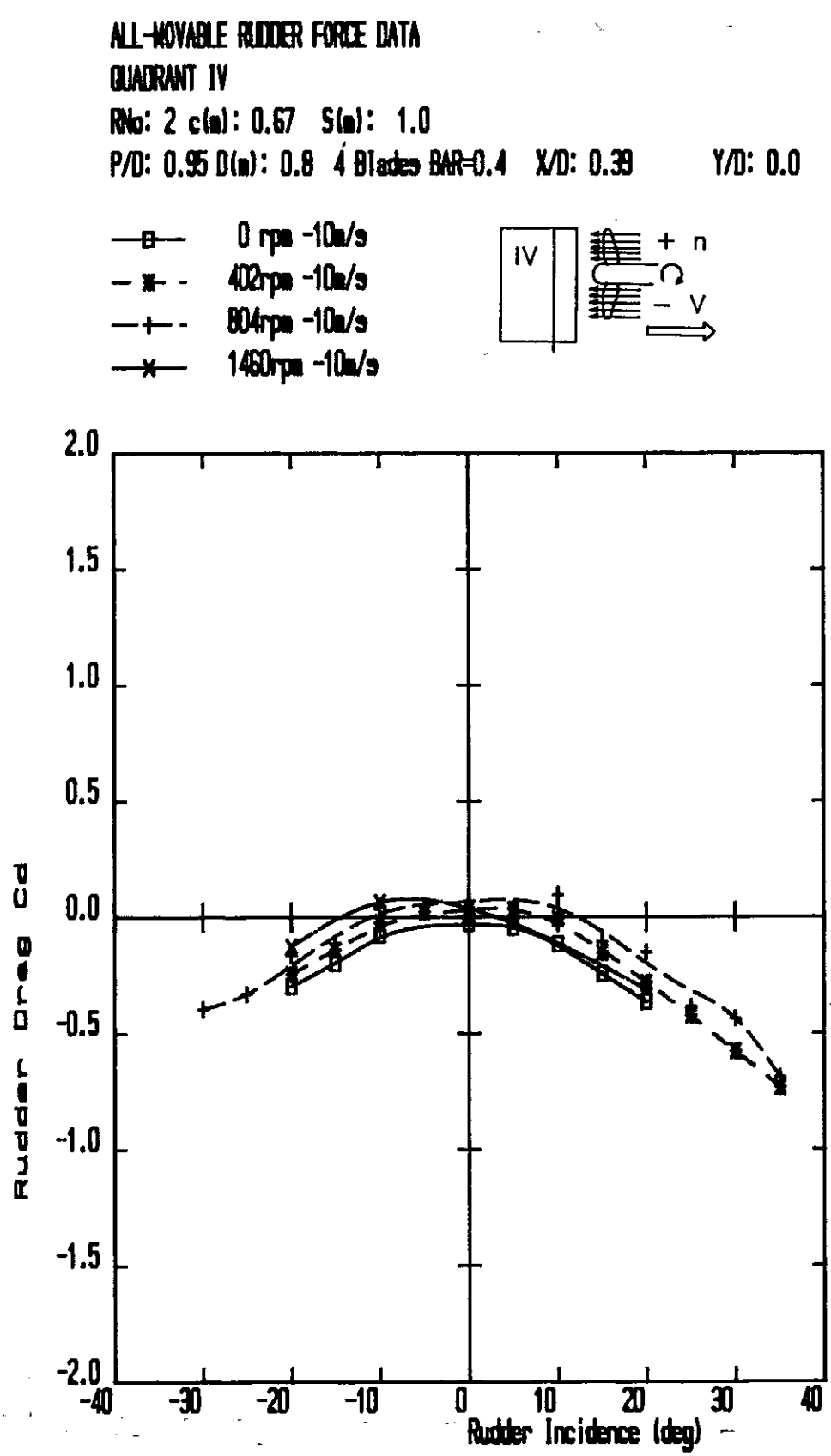


Figure 10 The influence of propeller advance angle on rudder drag C_D for all four quadrants of operation QUADRANT IV

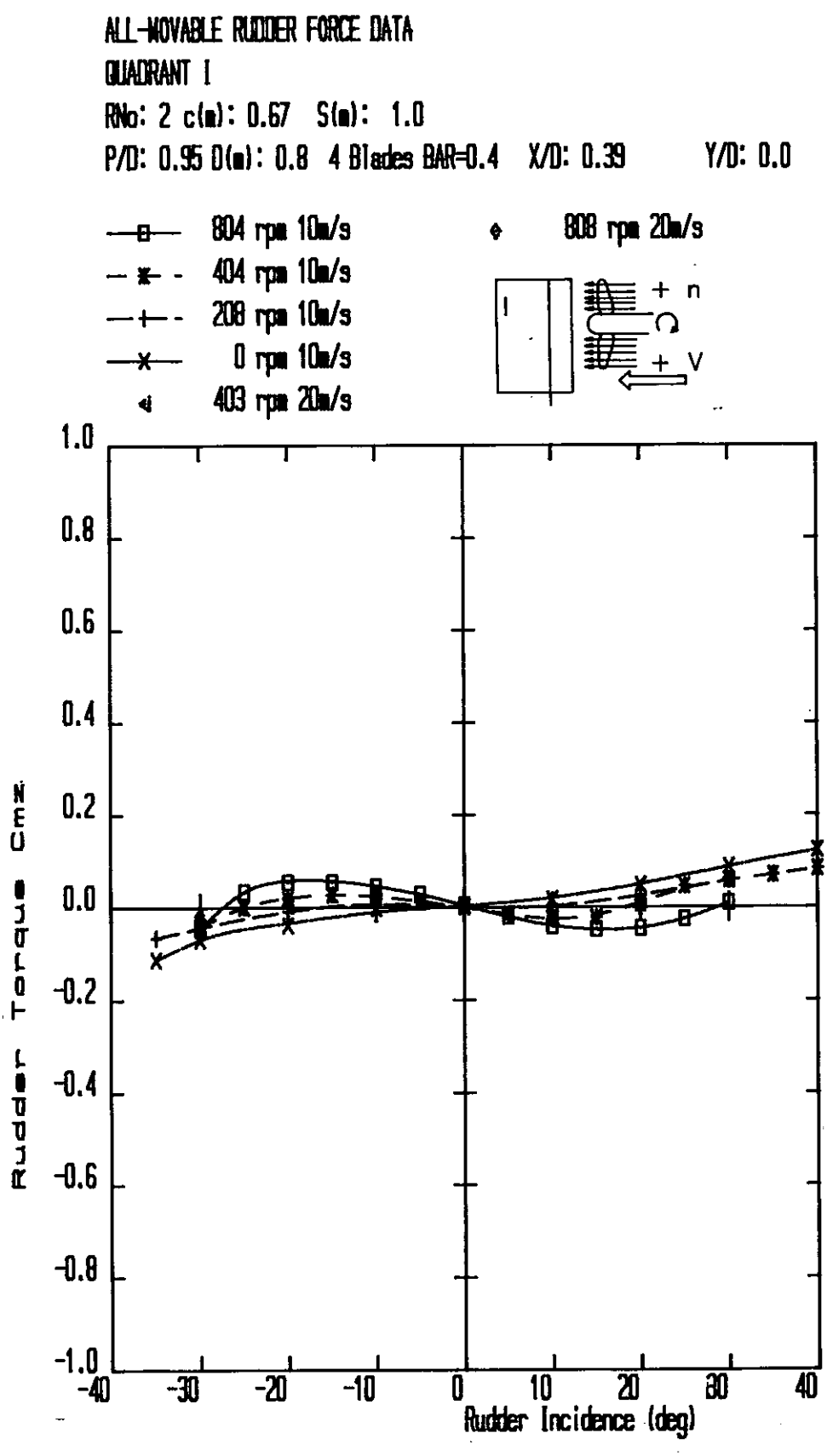


Figure 11 The influence of propeller advance angle on rudder torque C_{Mz} for all four quadrants of operation QUADRANT I

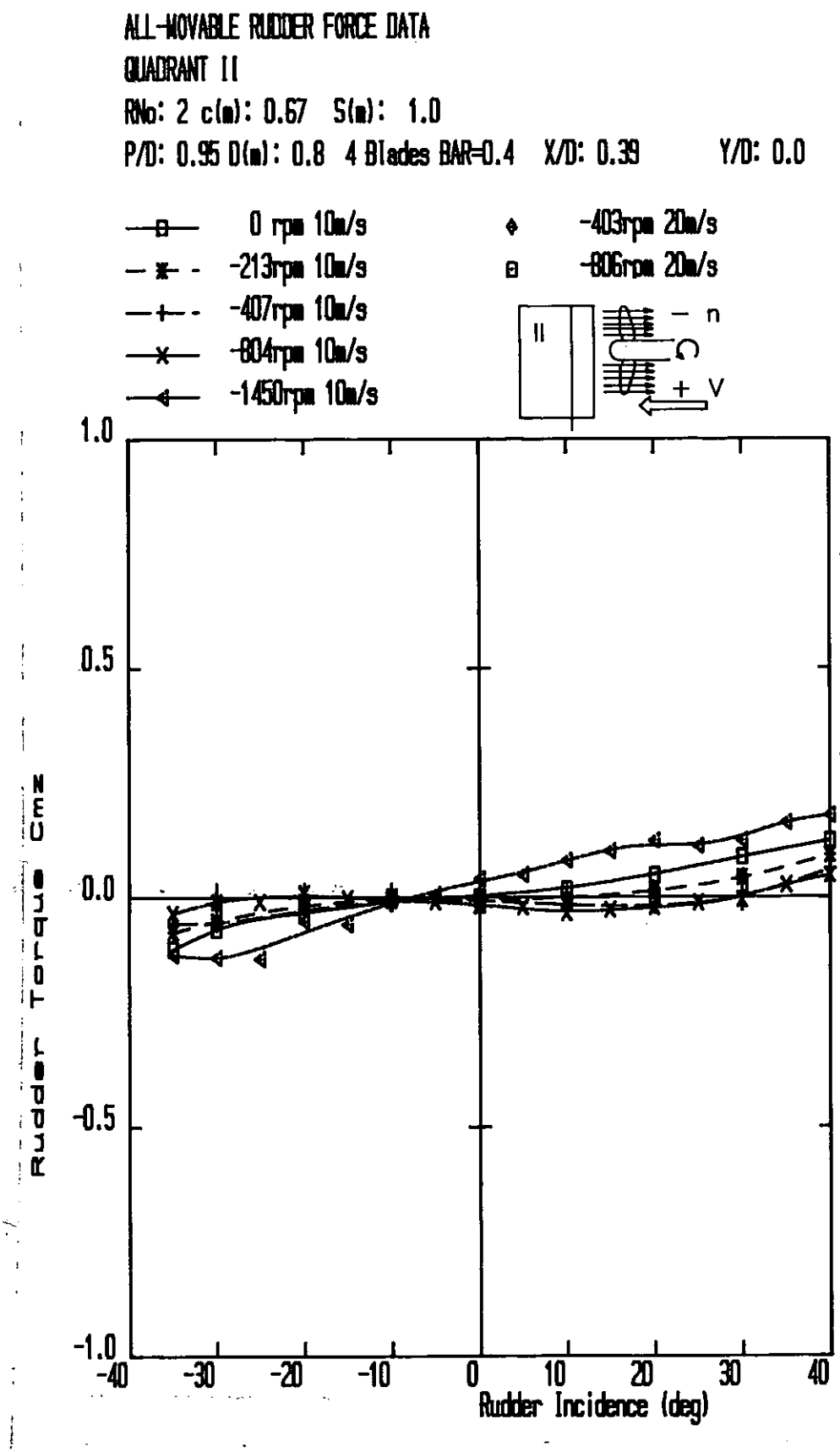


Figure 11 The influence of propeller advance angle on rudder torque C_{Mz} for all four quadrants of operation QUADRANT II

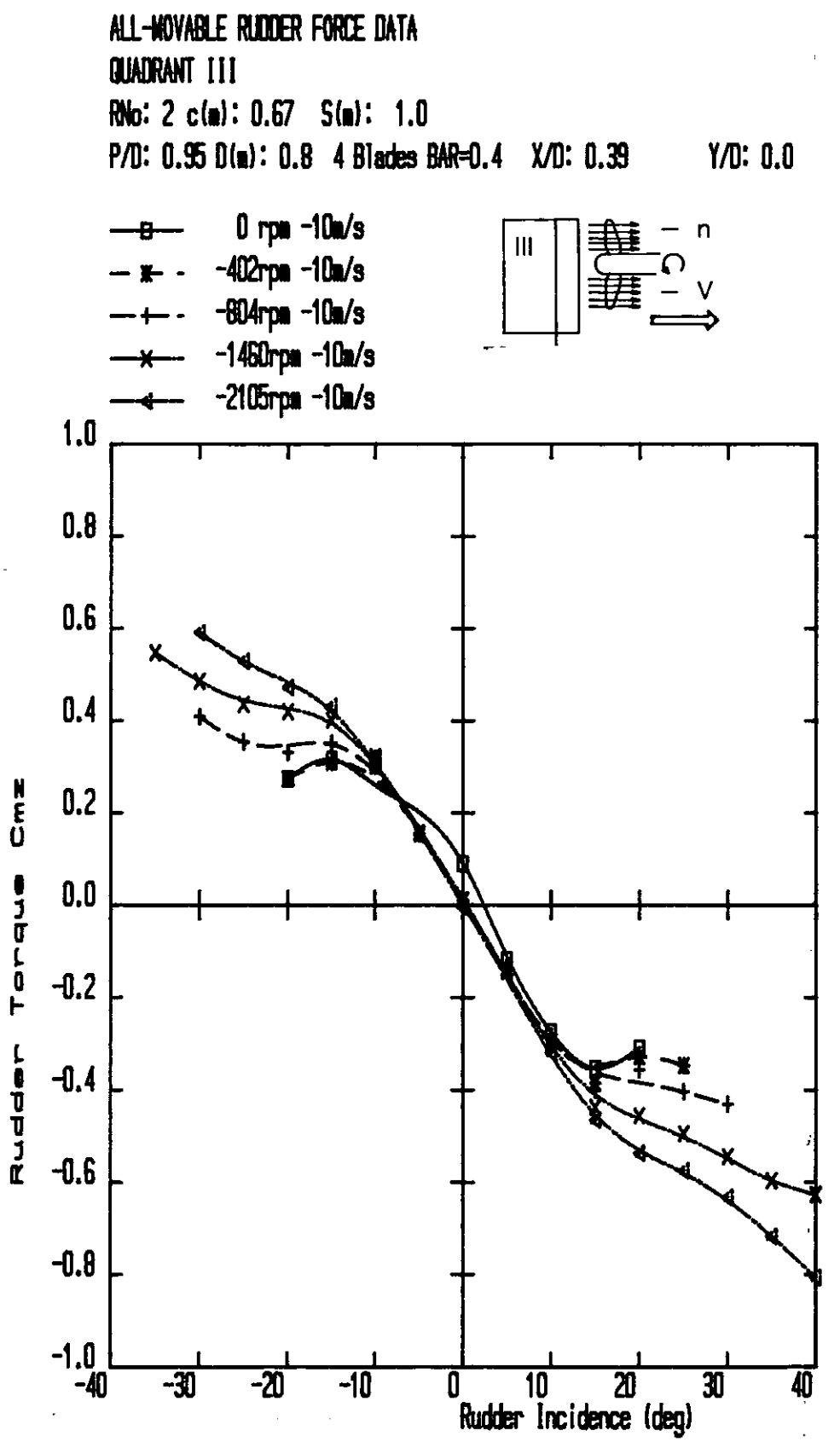


Figure 11 The influence of propeller advance angle on rudder torque C_{Mz} for all four quadrants of operation QUADRANT III

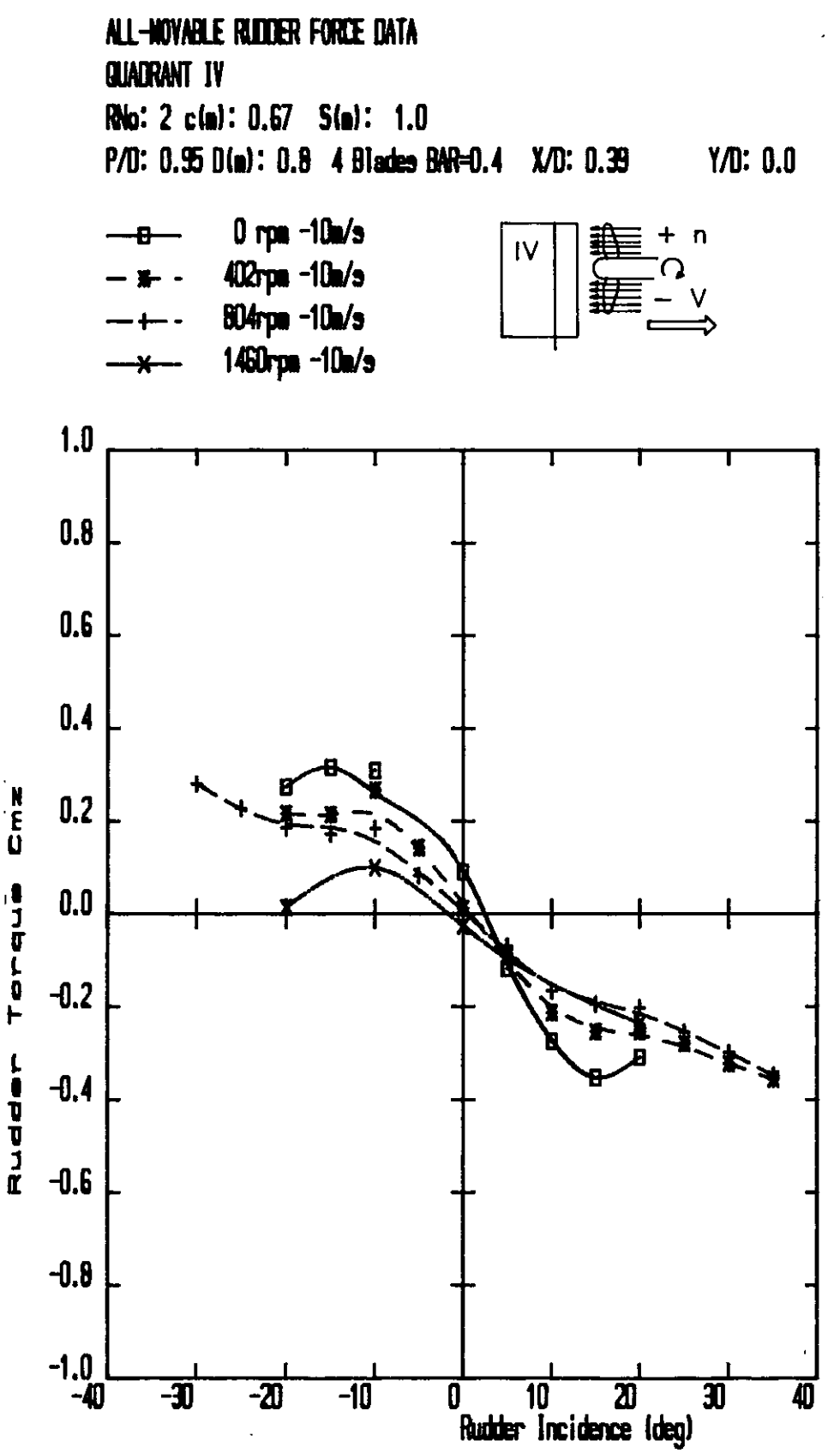


Figure 11 The influence of propeller advance angle on rudder torque C_{Mz} for all four quadrants of operation QUADRANT IV

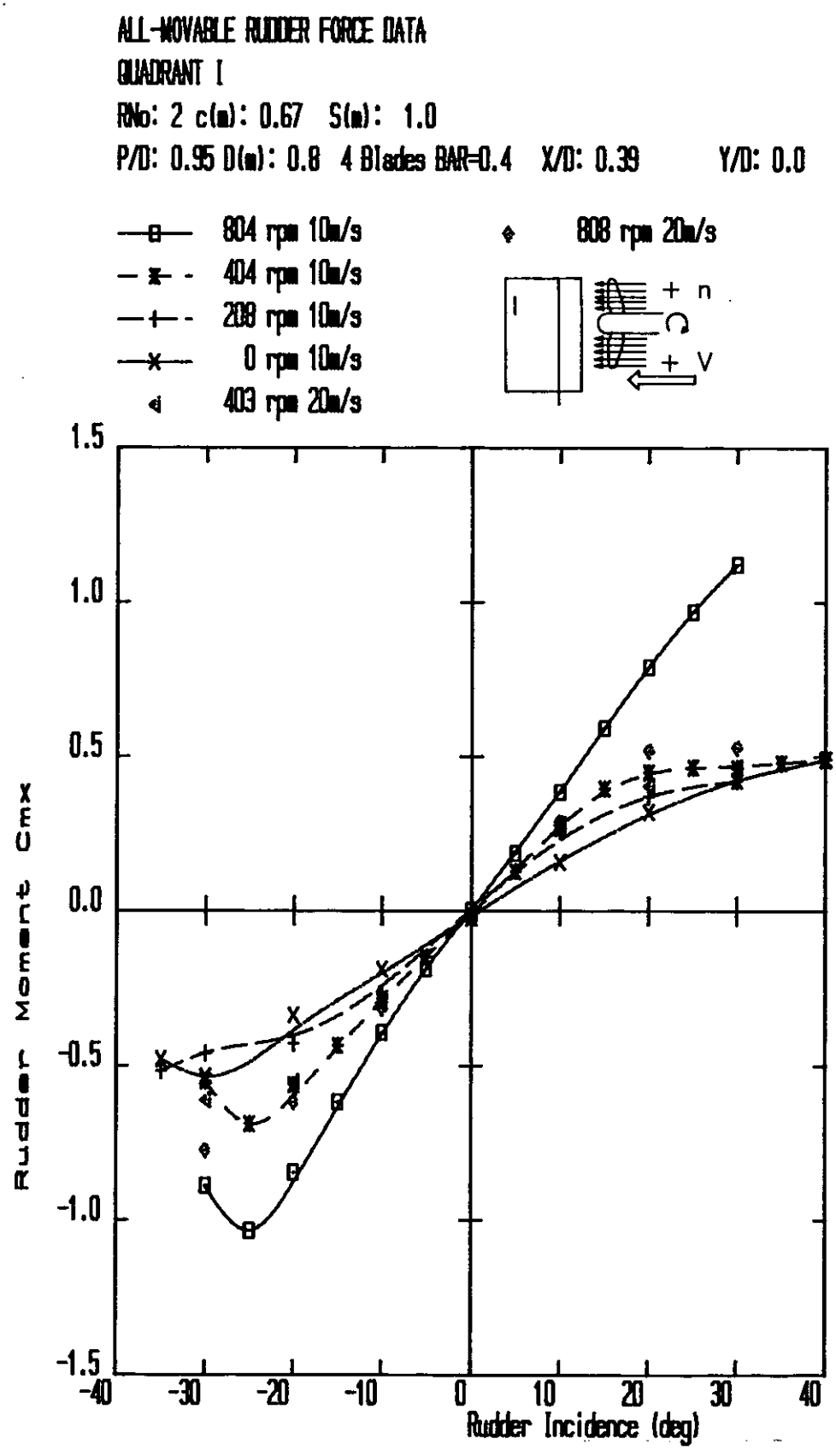


Figure 12 The influence of propeller advance angle on rudder root moment C_{Mx} for all four quadrants of operation QUADRANT I

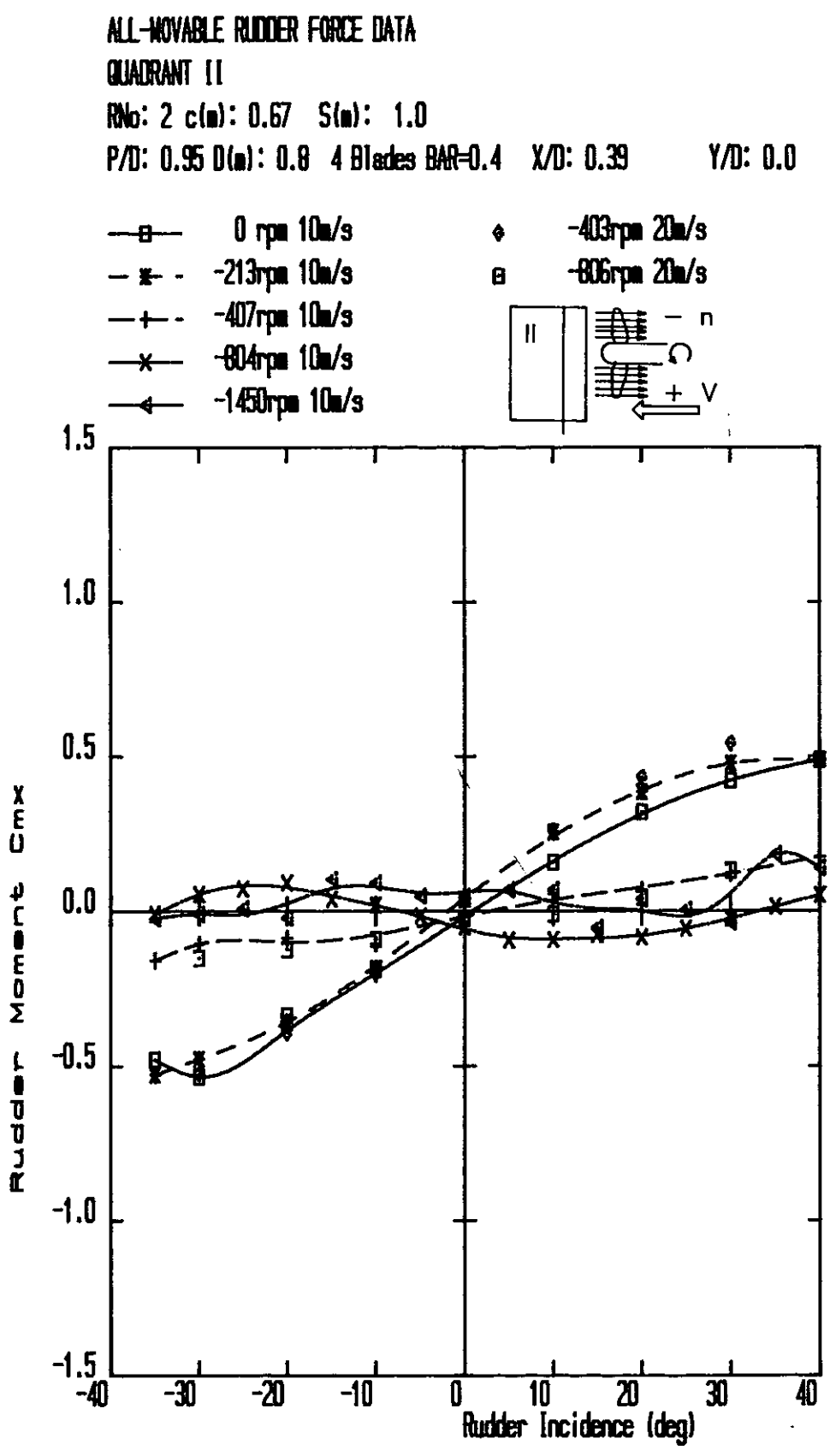


Figure 12 The influence of propeller advance angle on rudder root moment C_{Mx} for all four quadrants of operation QUADRANT II

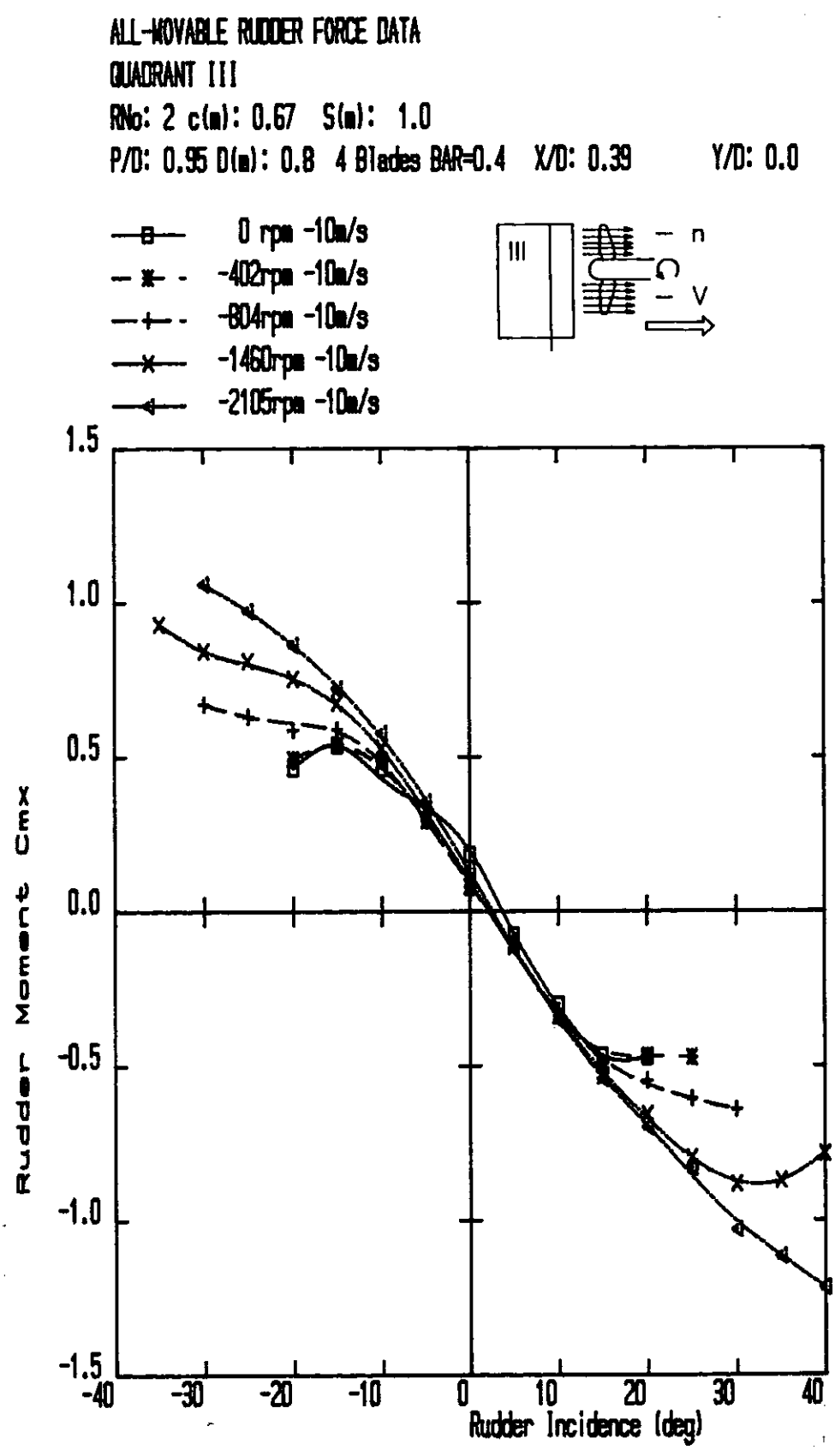


Figure 12 The influence of propeller advance angle on rudder root moment C_{Mx} for all four quadrants of operation QUADRANT III

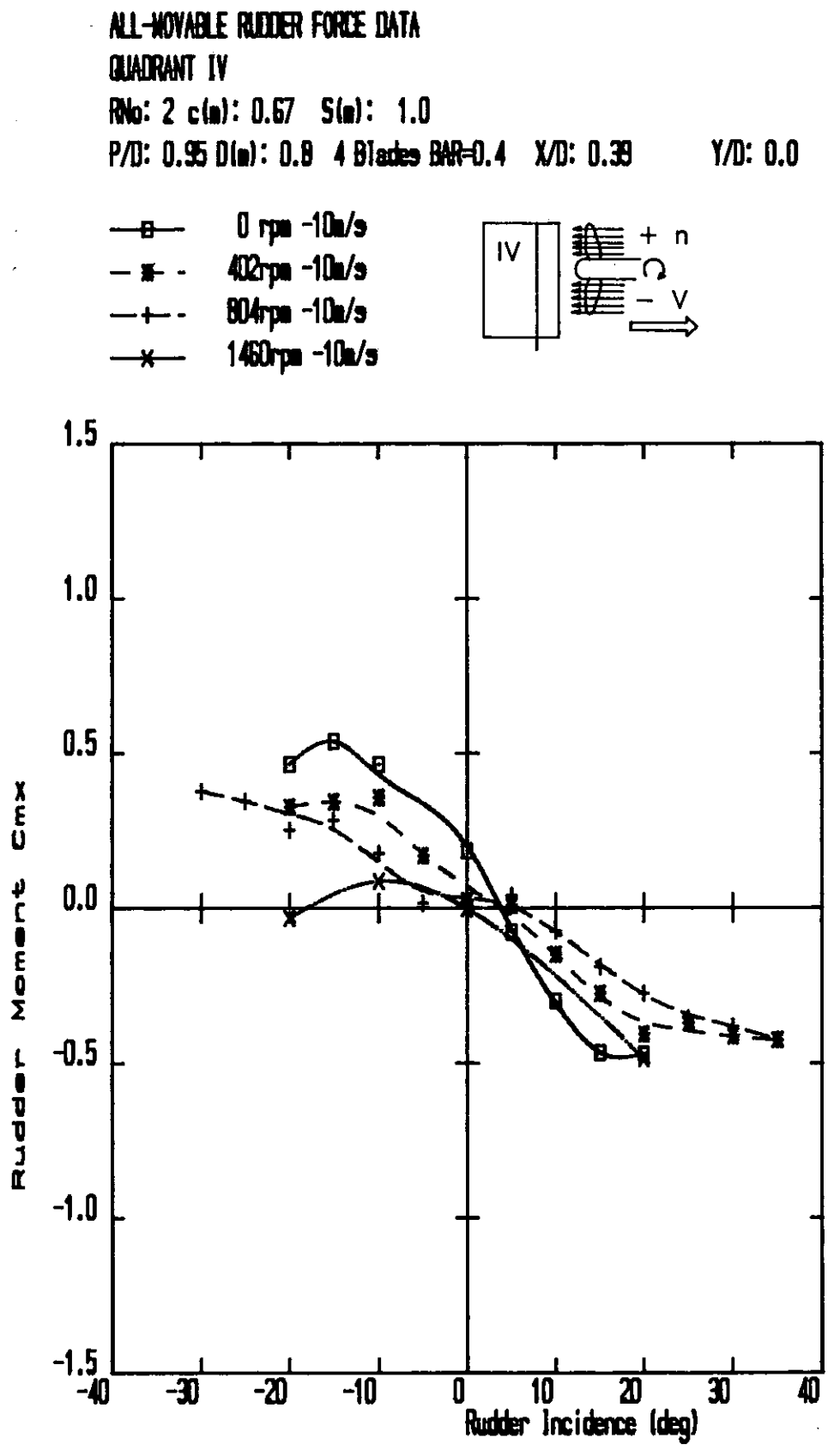


Figure 12 The influence of propeller advance angle on rudder root moment C_{Mx} for all four quadrants of operation QUADRANT IV

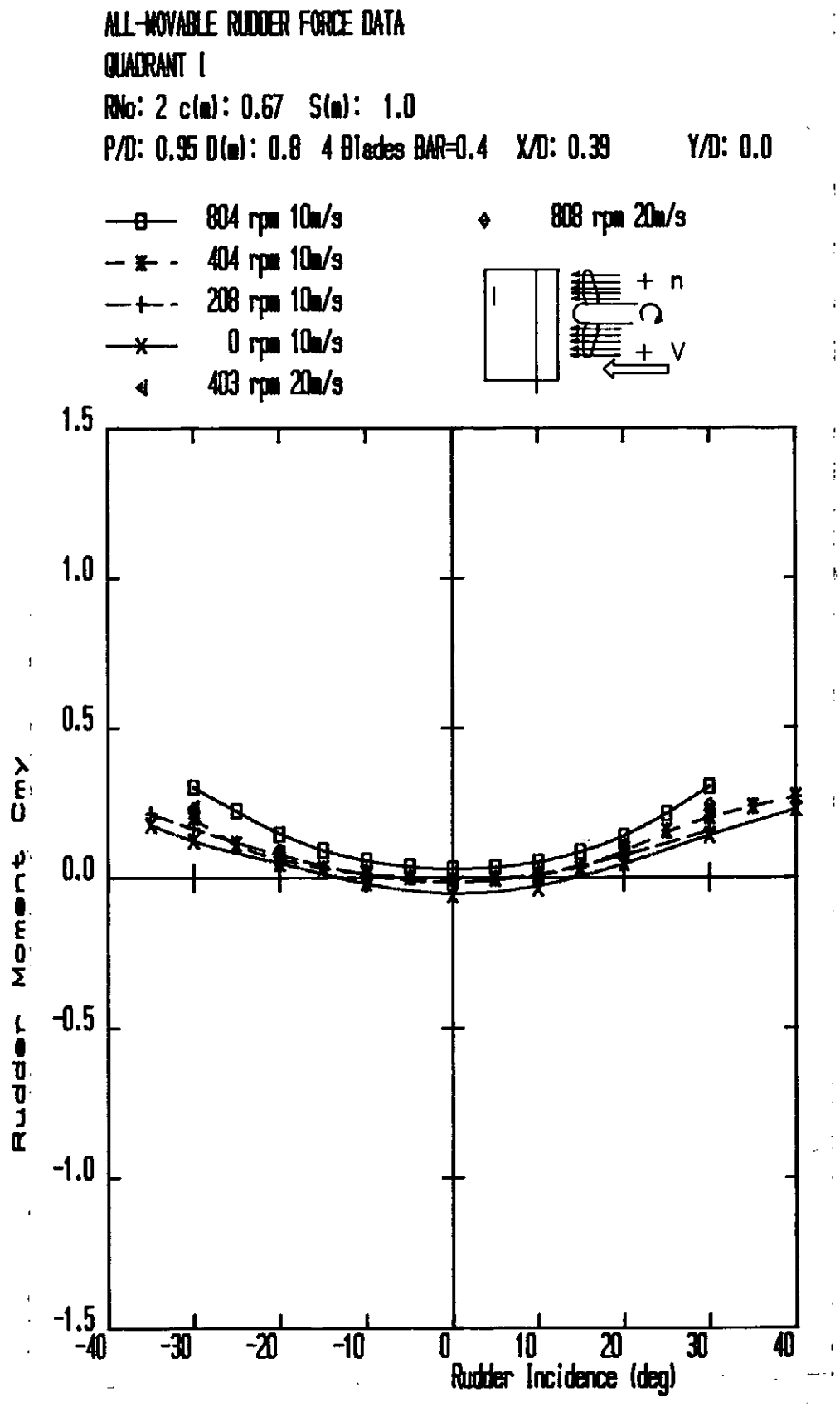


Figure 13 The influence of propeller advance angle on rudder root moment C_{My} for all four quadrants of operation QUADRANT I

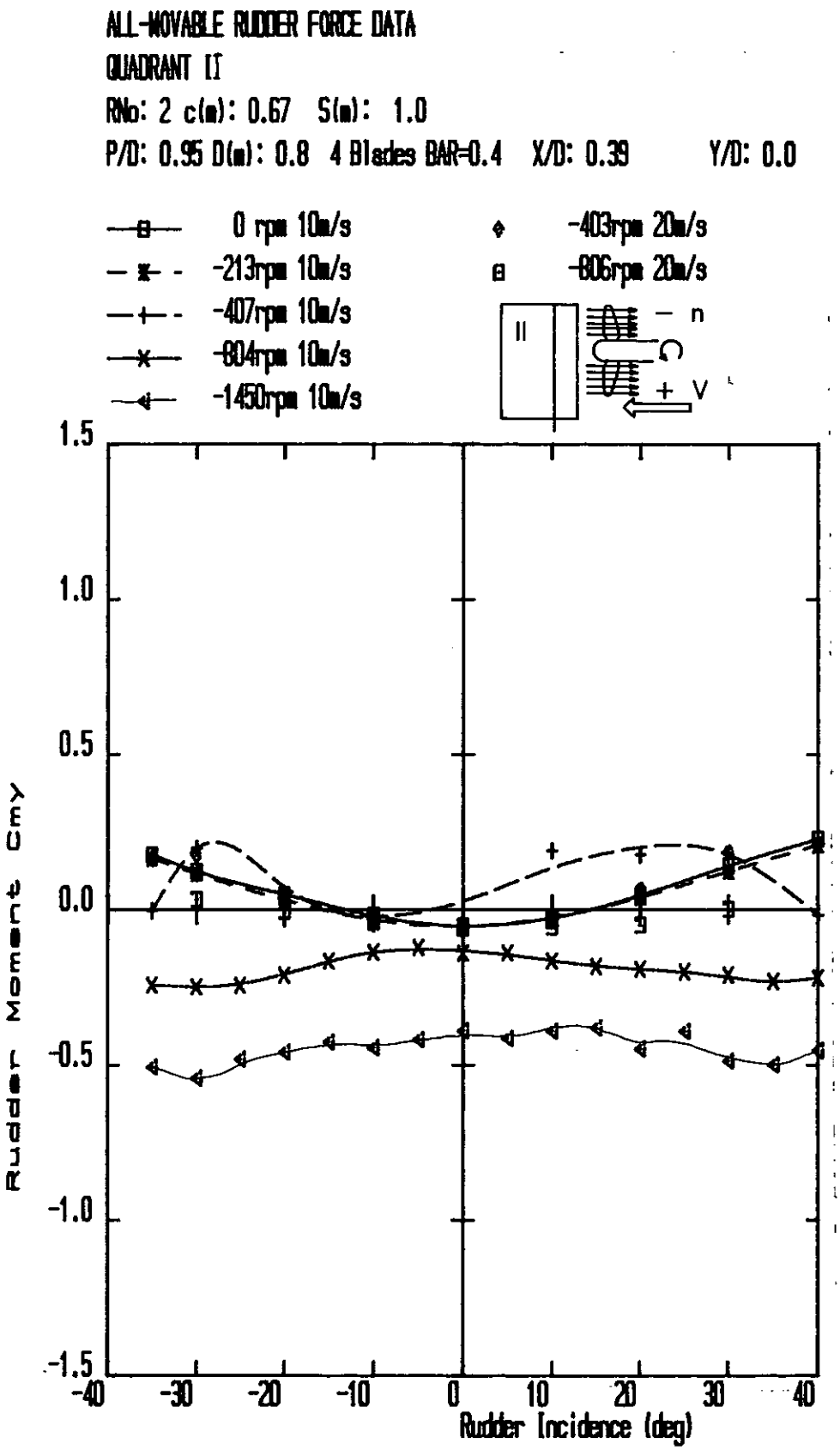


Figure 13 The influence of propeller advance angle on rudder root moment C_{My} for all four quadrants of operation QUADRANT II

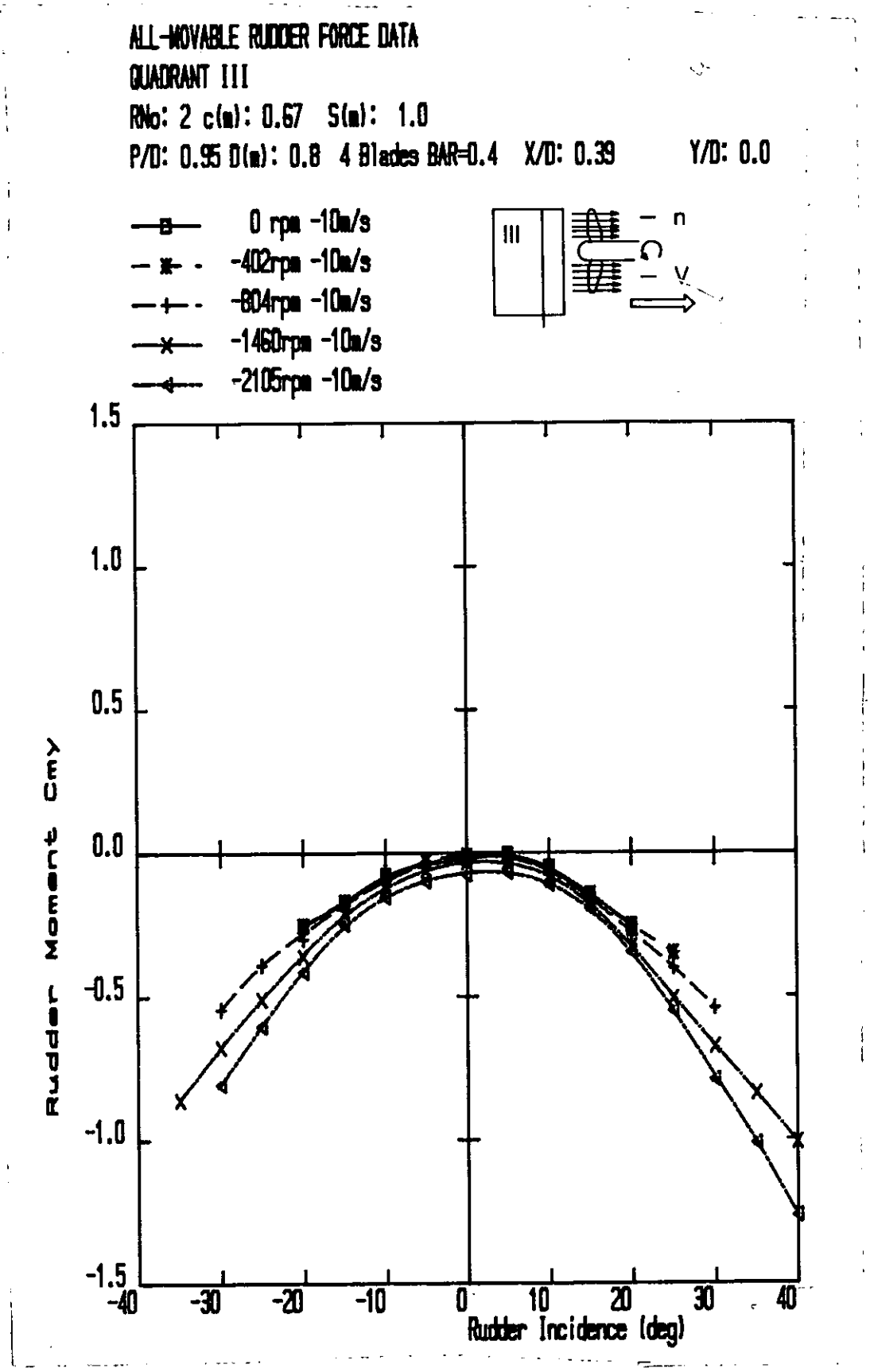


Figure 13 The influence of propeller advance angle on rudder root moment C_{My} for all four quadrants of operation QUADRANT III

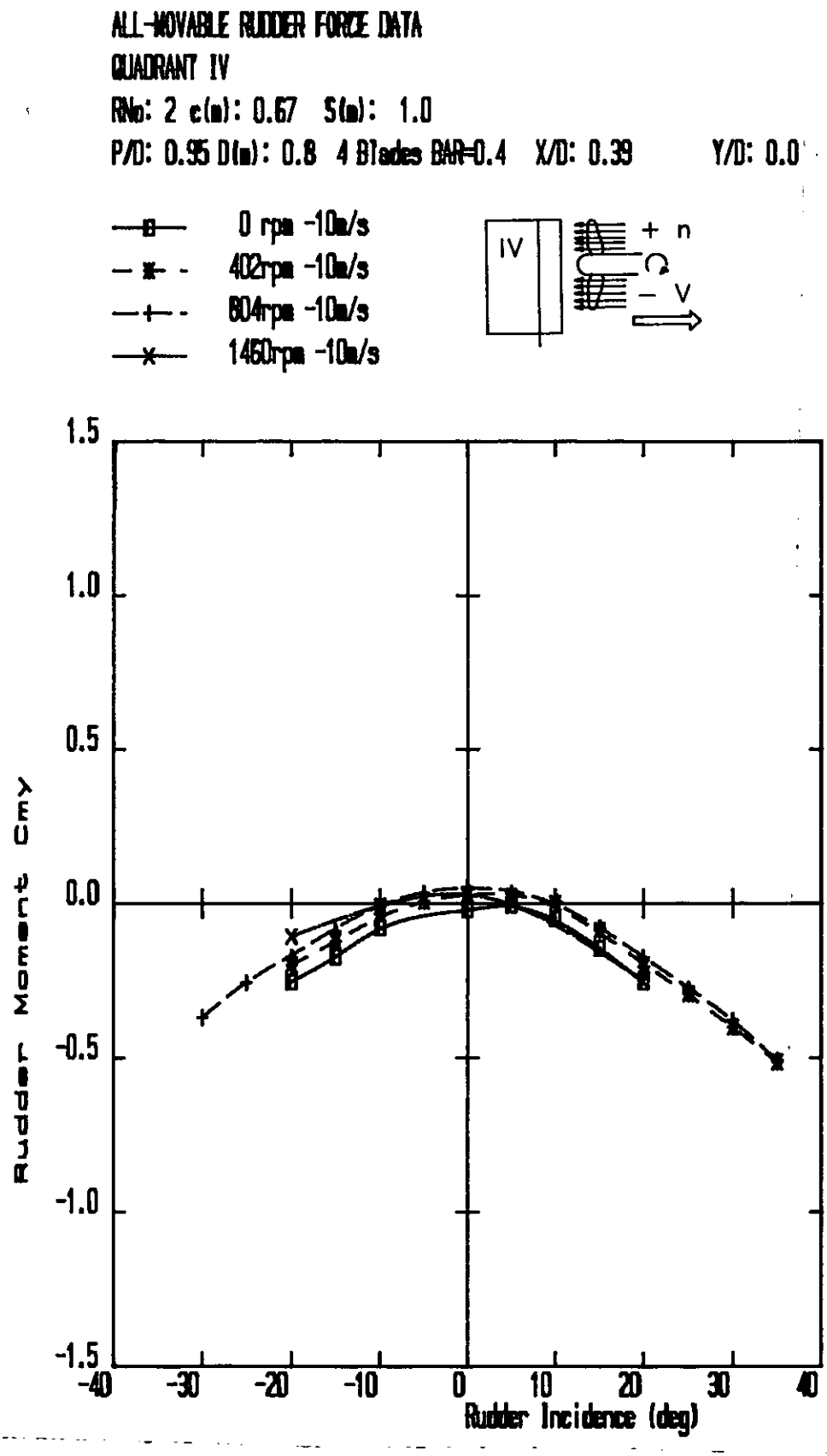


Figure 13 The influence of propeller advance angle on rudder root moment C_{My} for all four quadrants of operation QUADRANT IV

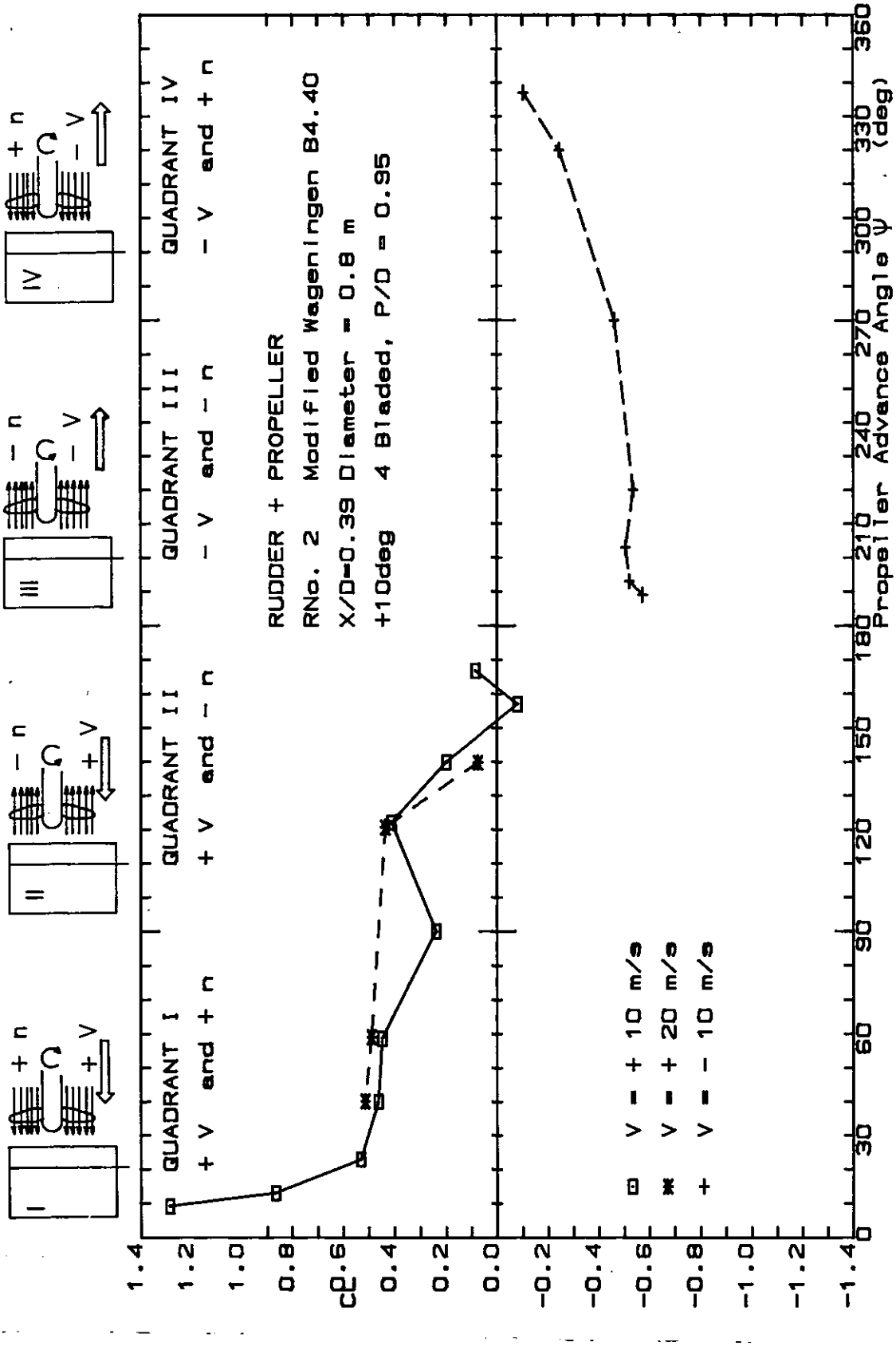


Figure 14 The variation of rudder sideforce C_L at $+10^o$ incidence with propeller advance angle ψ

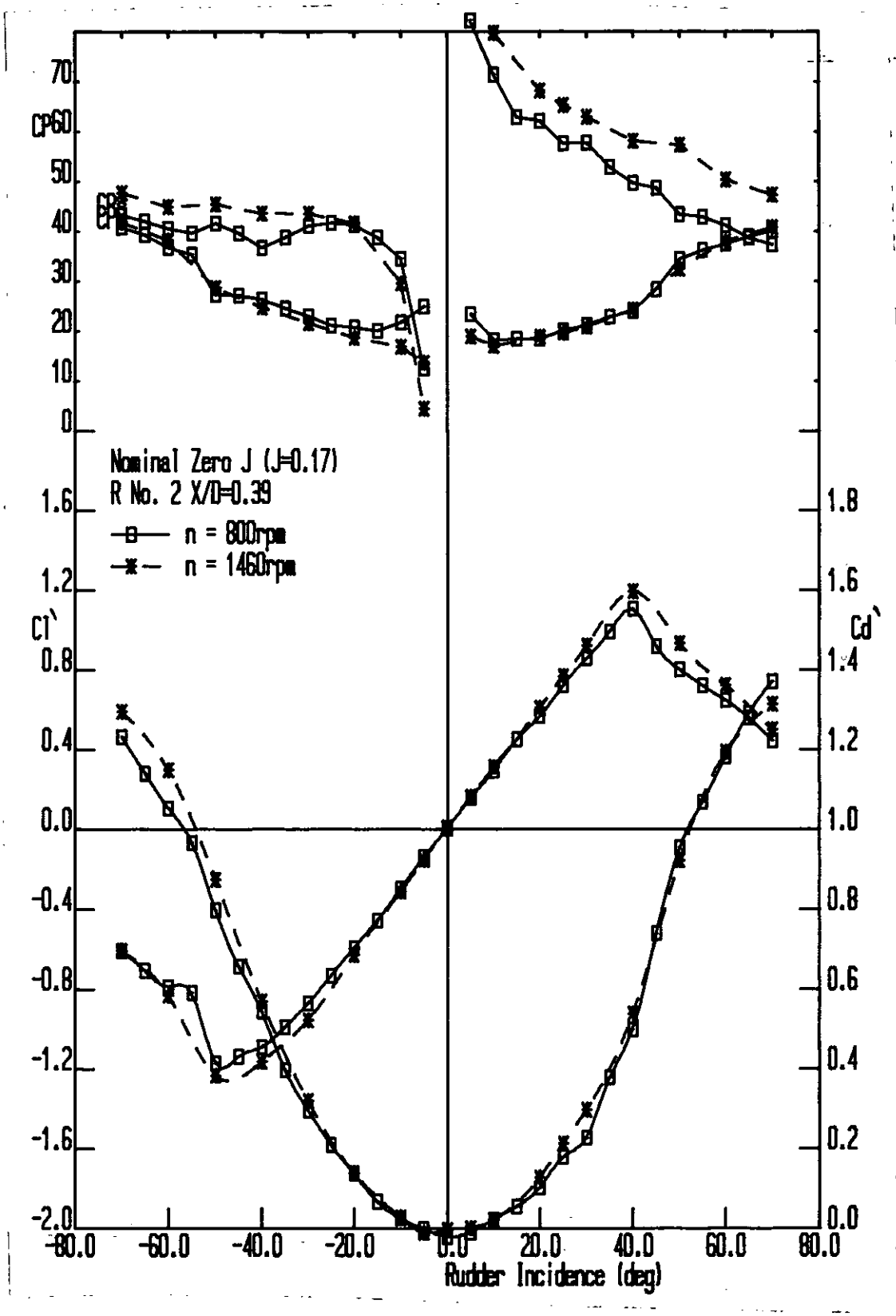


Figure 15 Variation of all-movable rudder performance with propeller rate of revolution at a propeller advance ratio of J=0.17

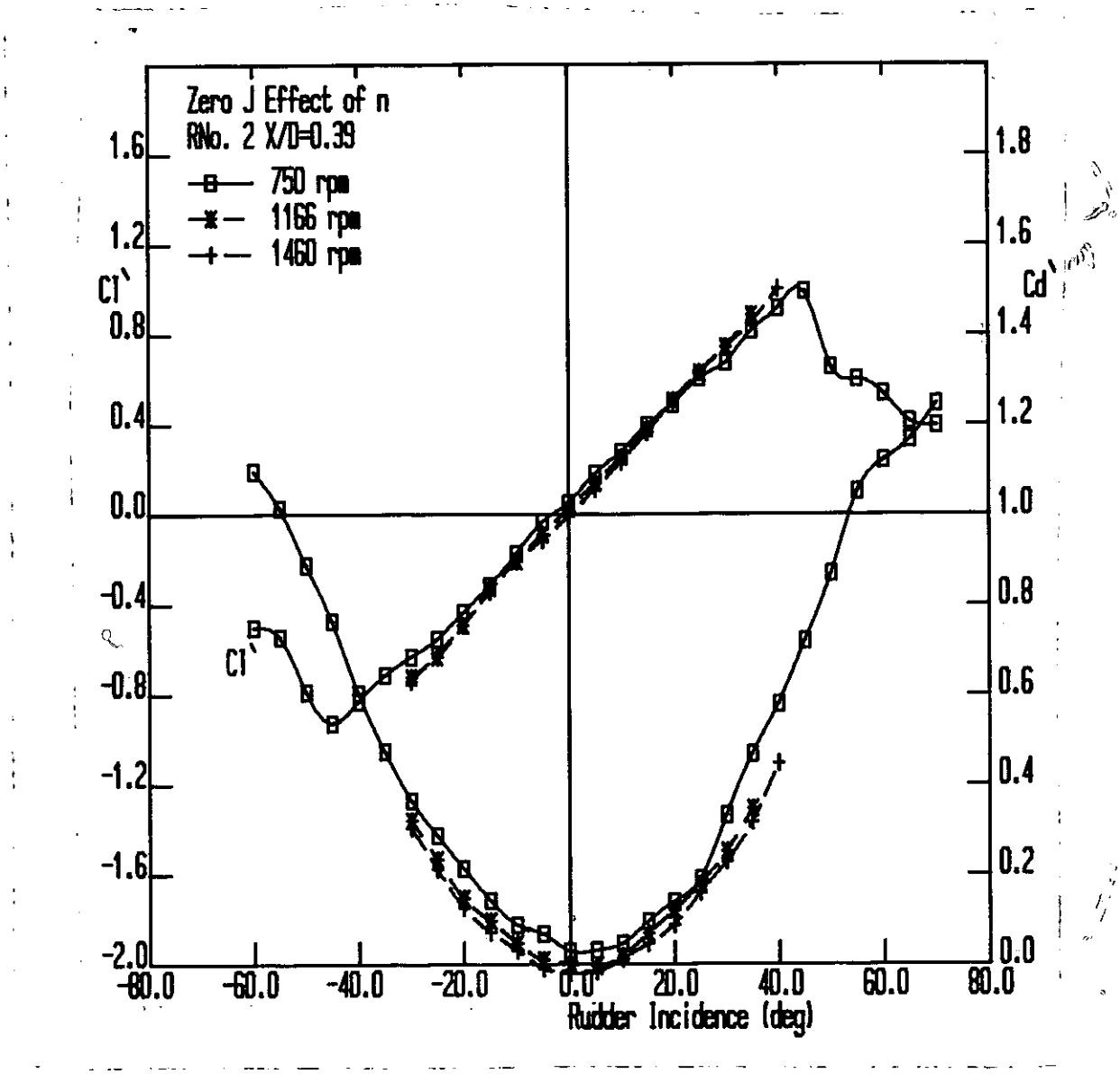


Figure 16 Variation of all-movable rudder performance with propeller rate of revolution at zero propeller advance ratio of J=0.0

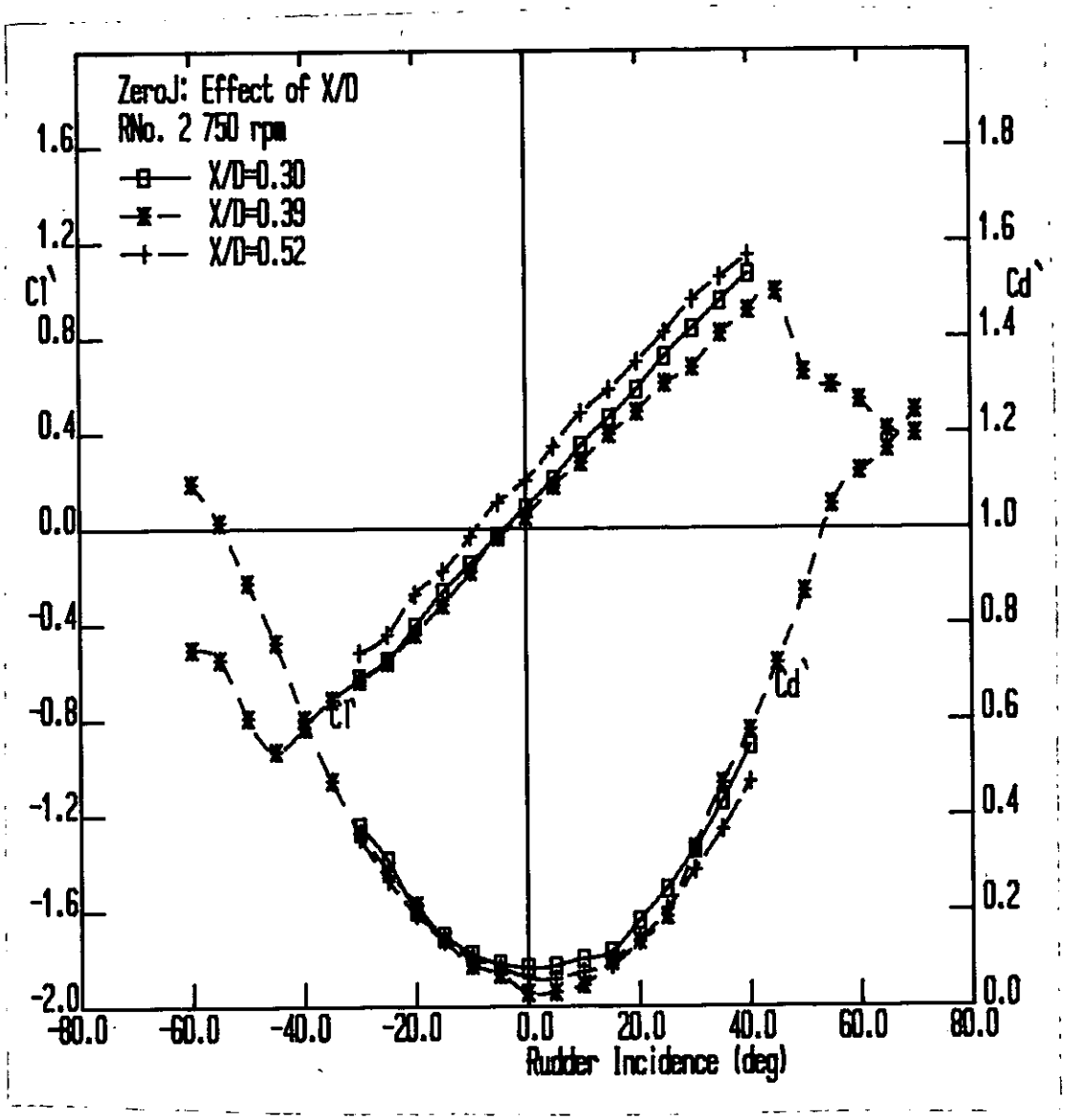


Figure 17 Variation of all-movable rudder performance with change in longitudinal separation X/D at 750 rpm with zero propeller advance ratio

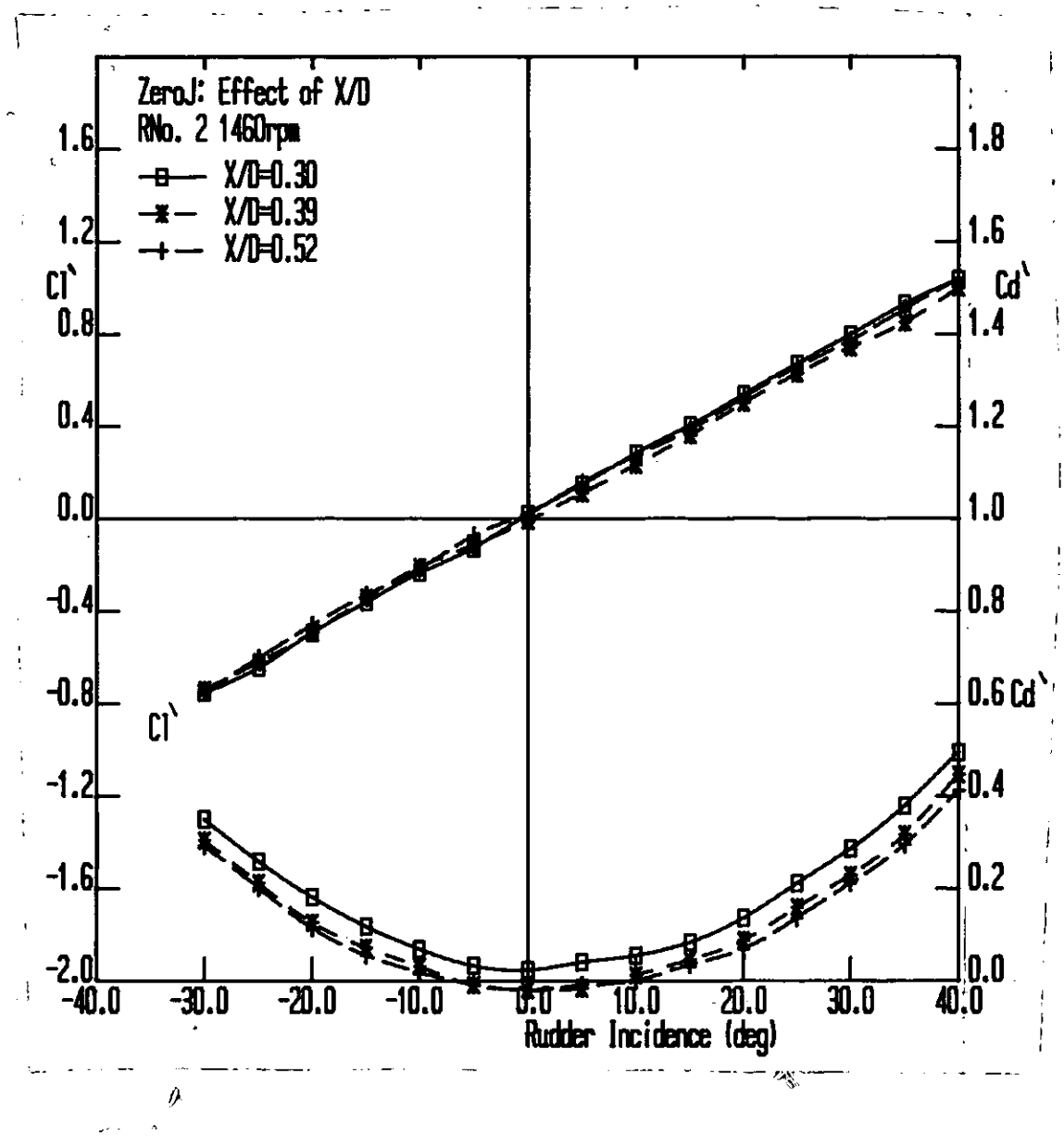


Figure 18 Variation of all-movable rudder performance with change in longitudinal separation X/D at 1460 rpm with zero propeller advance ratio

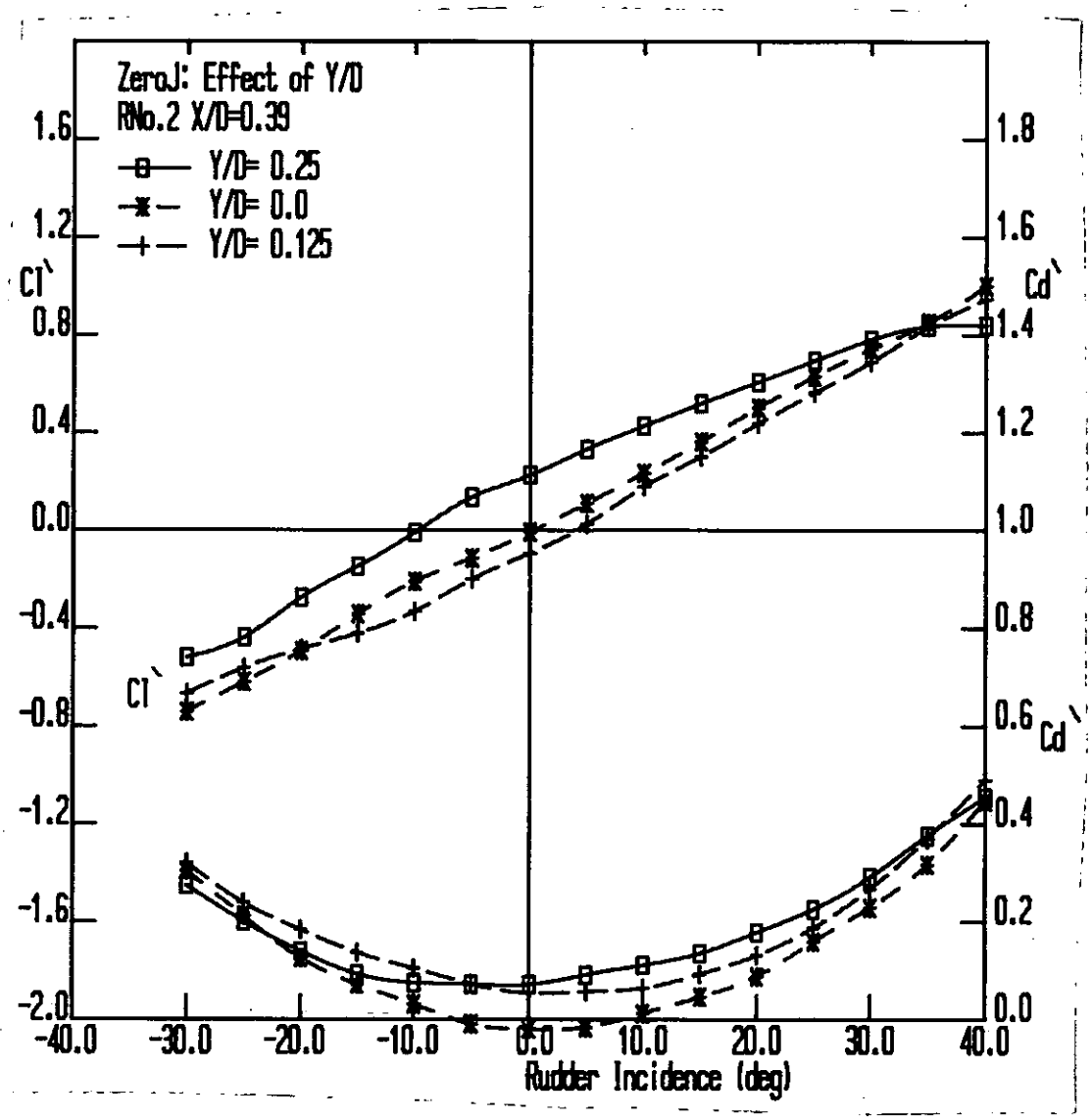


Figure 19 Variation of all-movable rudder performance with change in lateral separation Y/D at 1460 rpm with zero propeller advance ratio

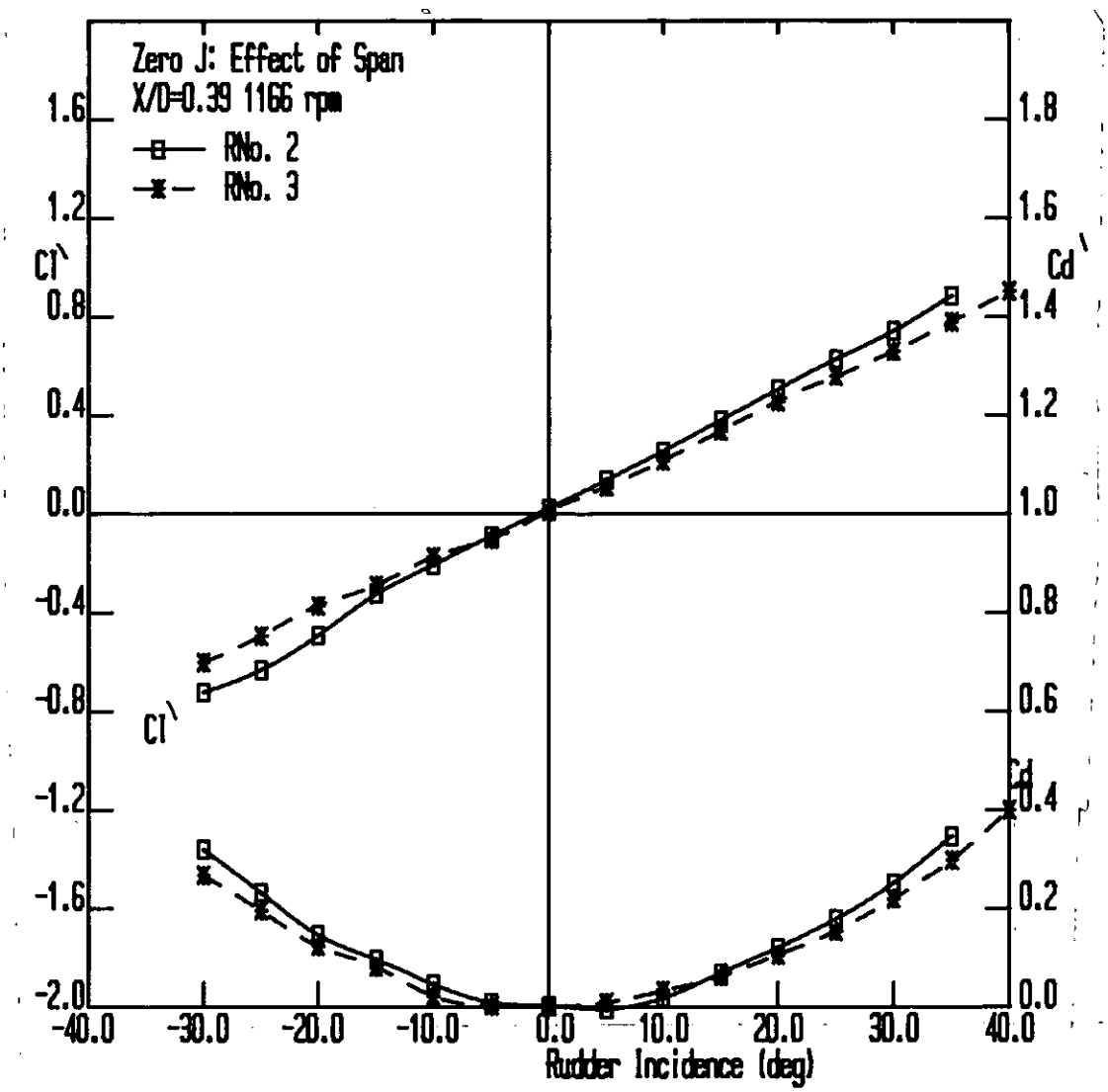


Figure 20 Variation of all-movable rudder performance with change in rudder span at 1166 rpm with zero propeller advance ratio

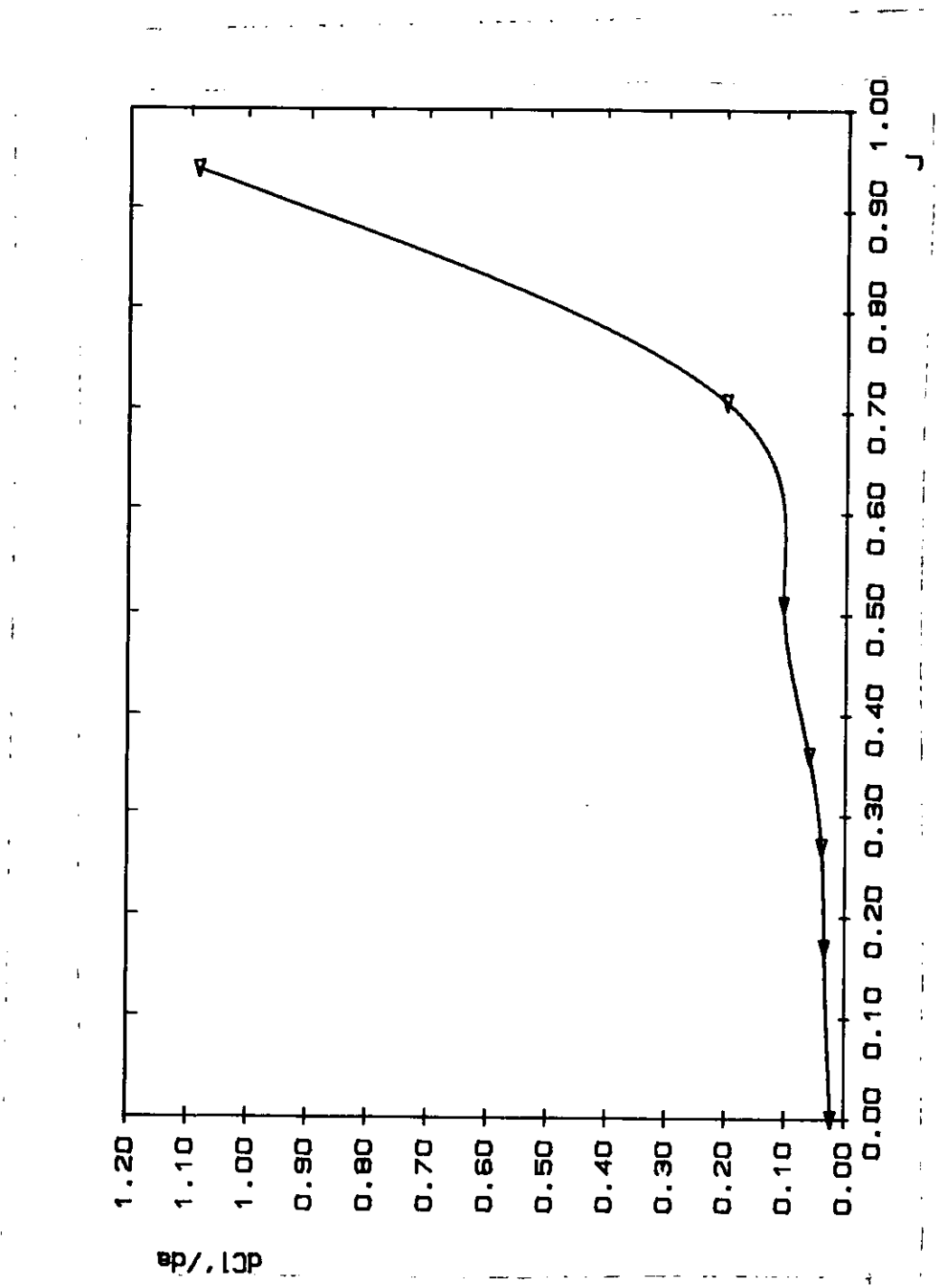


Figure 21 Variation of rudder lift-curve slope $dC_L'/d\alpha$ at zero incidence with advance ratio

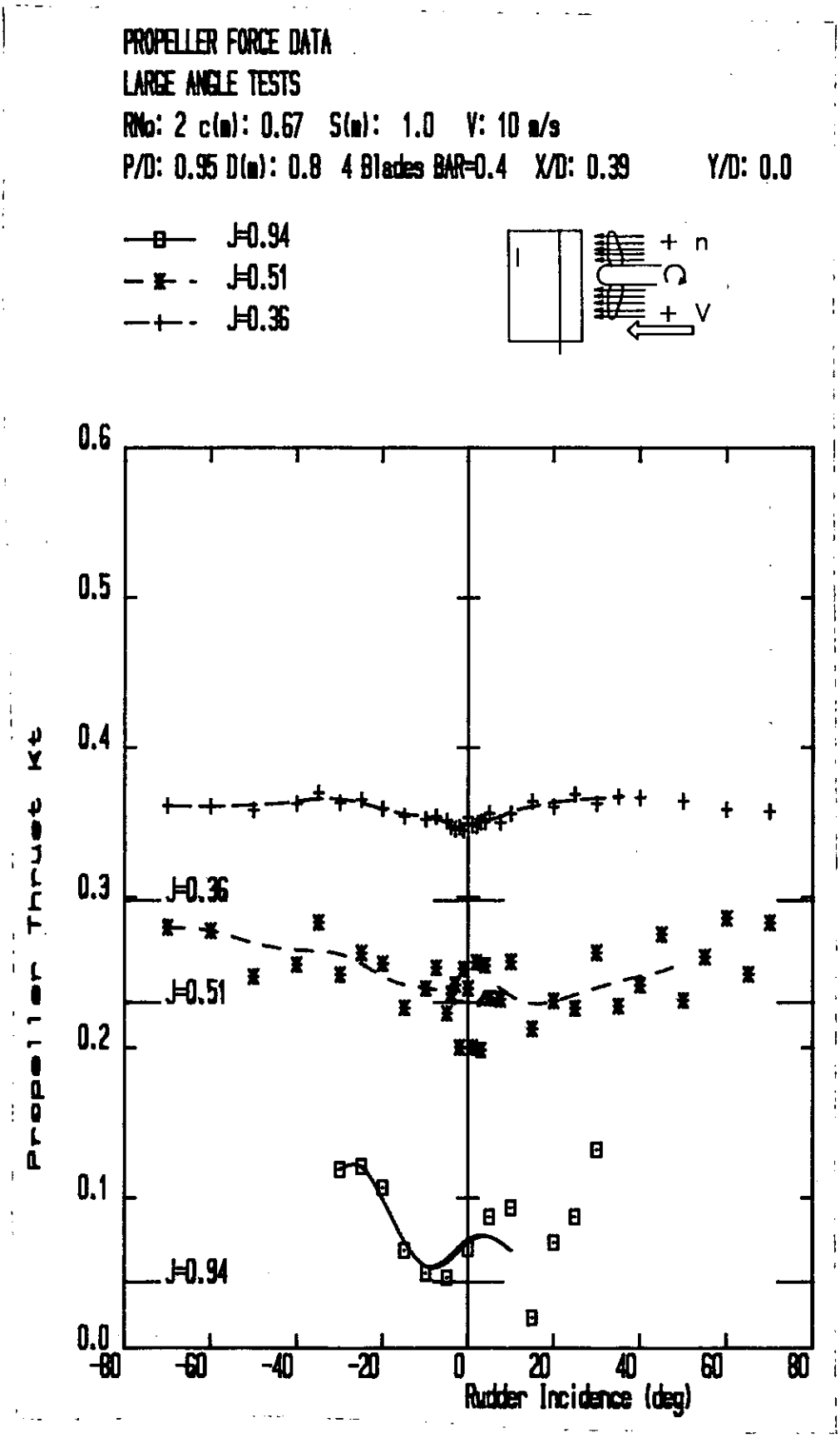


Figure 22 Effect of large all-movable rudder incidence on propeller thrust

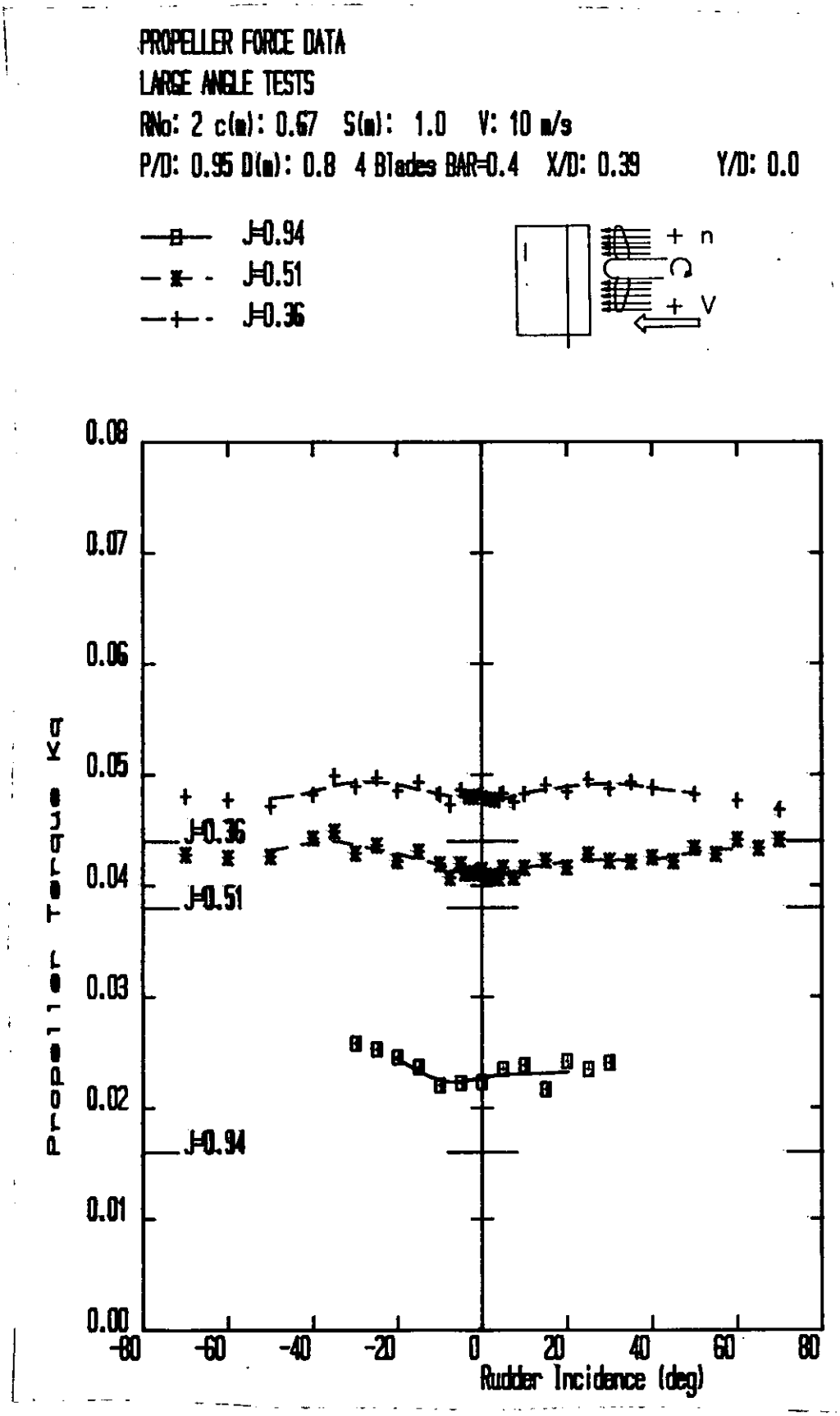


Figure 23 Effect of large all-movable rudder incidence on propeller torque

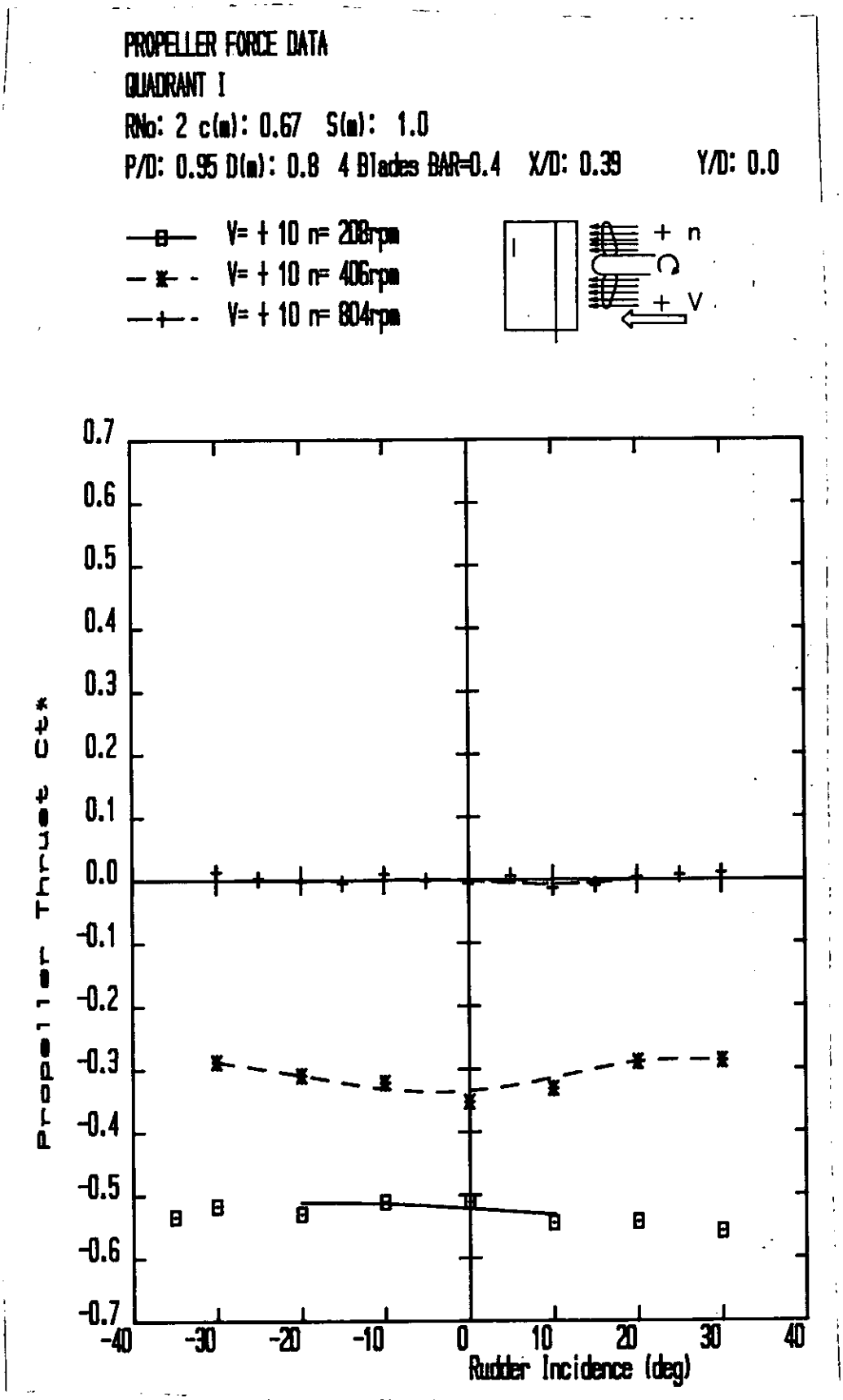


Figure 24 The influence of rudder incidence on propeller thrust C_T* for all four quadrants of operation QUADRANT I

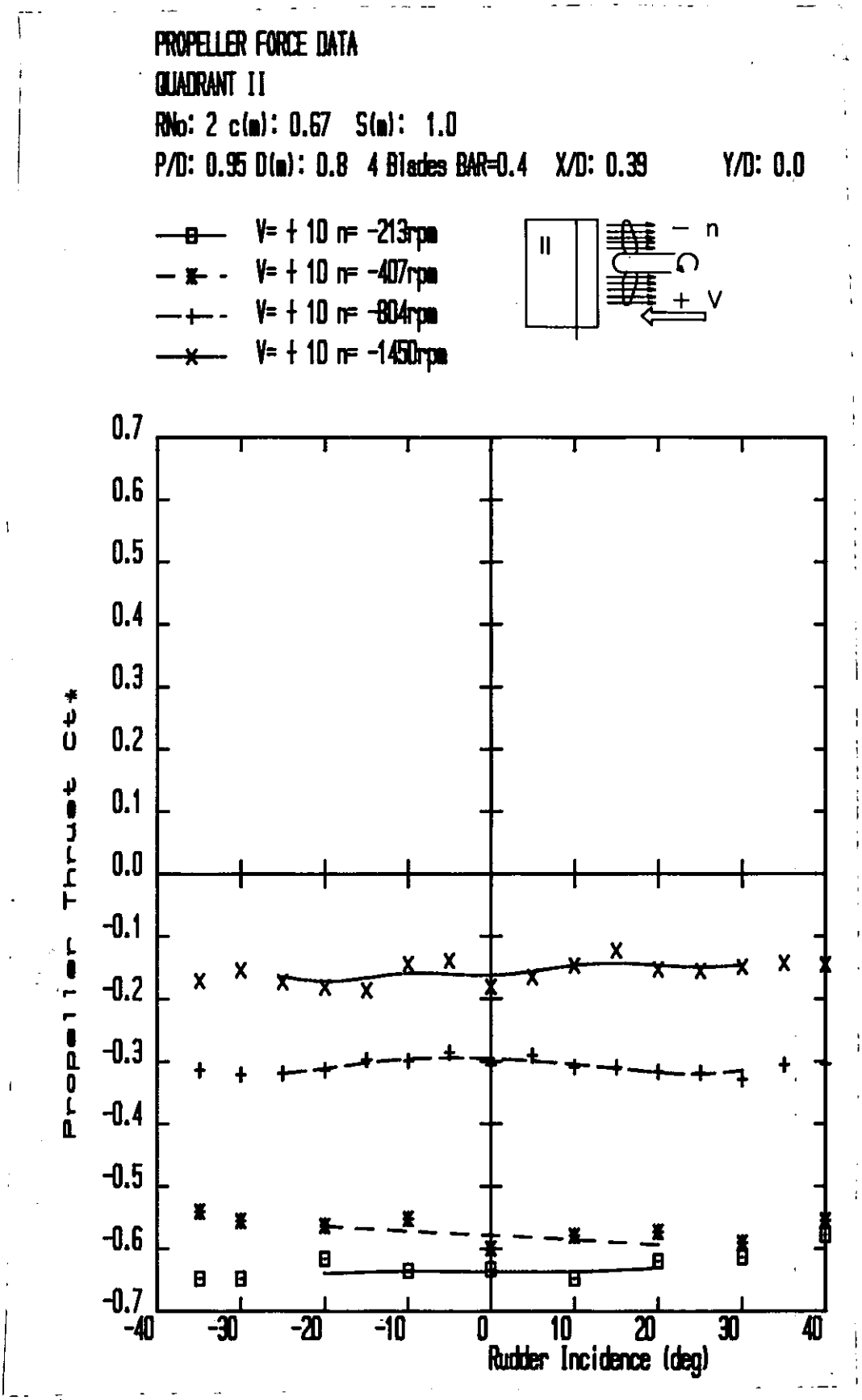


Figure 24 The influence of rudder incidence on propeller thrust C_T* for all four quadrants of operation QUADRANT II

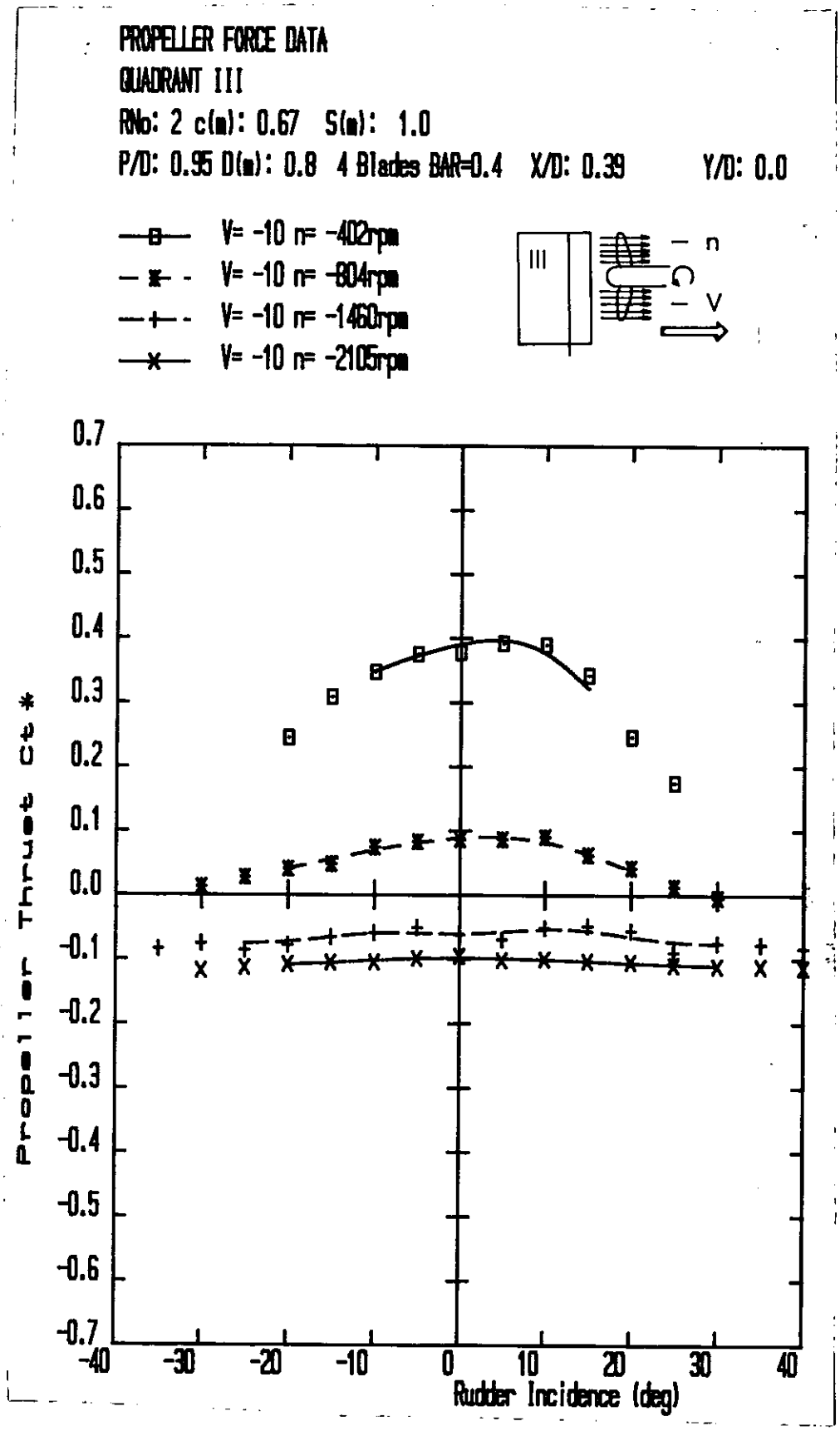


Figure 24 The influence of rudder incidence on propeller thrust C_T* for all four quadrants of operation QUADRANT III

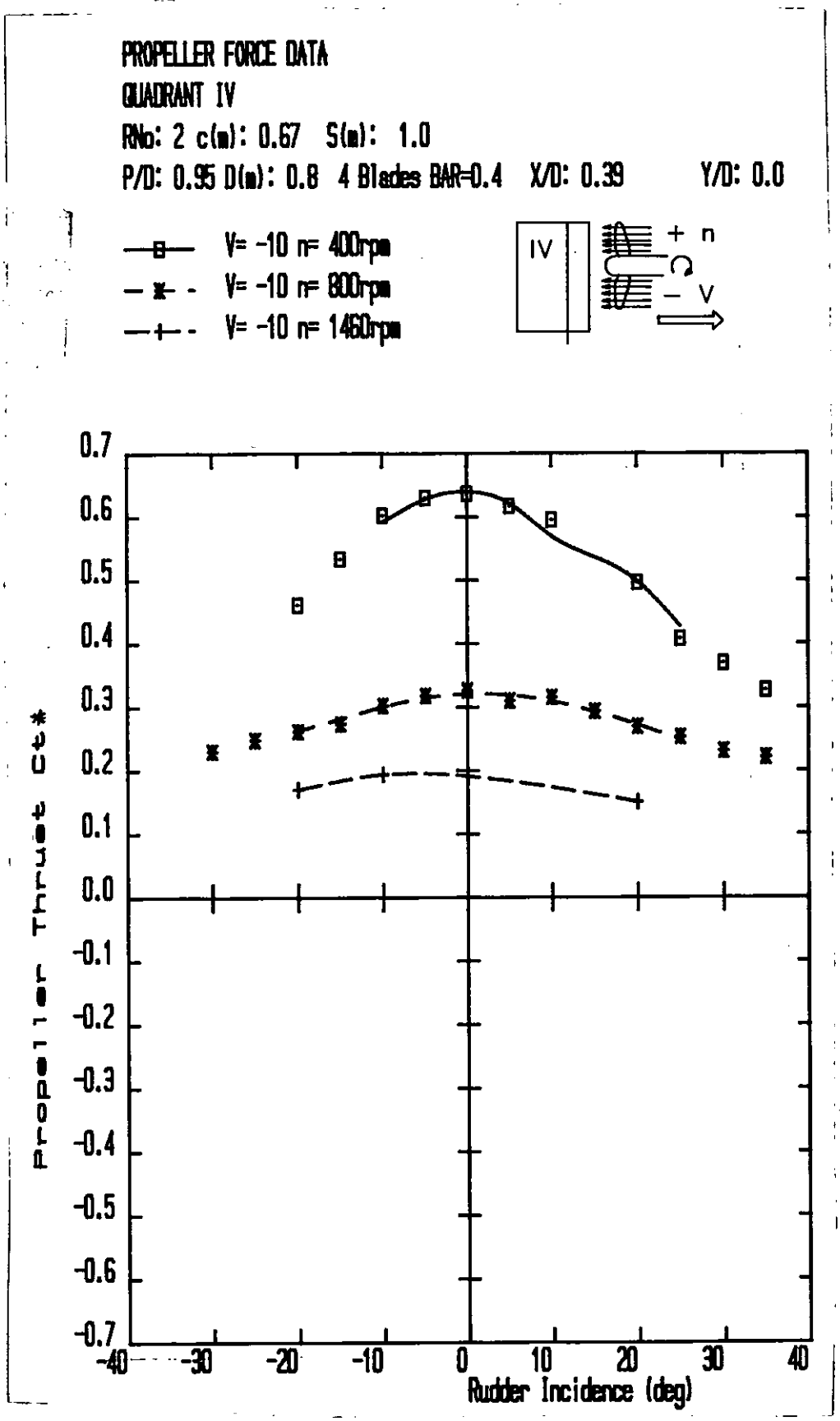


Figure 24 The influence of rudder incidence on propeller thrust C_T* for all four quadrants of operation QUADRANT IV

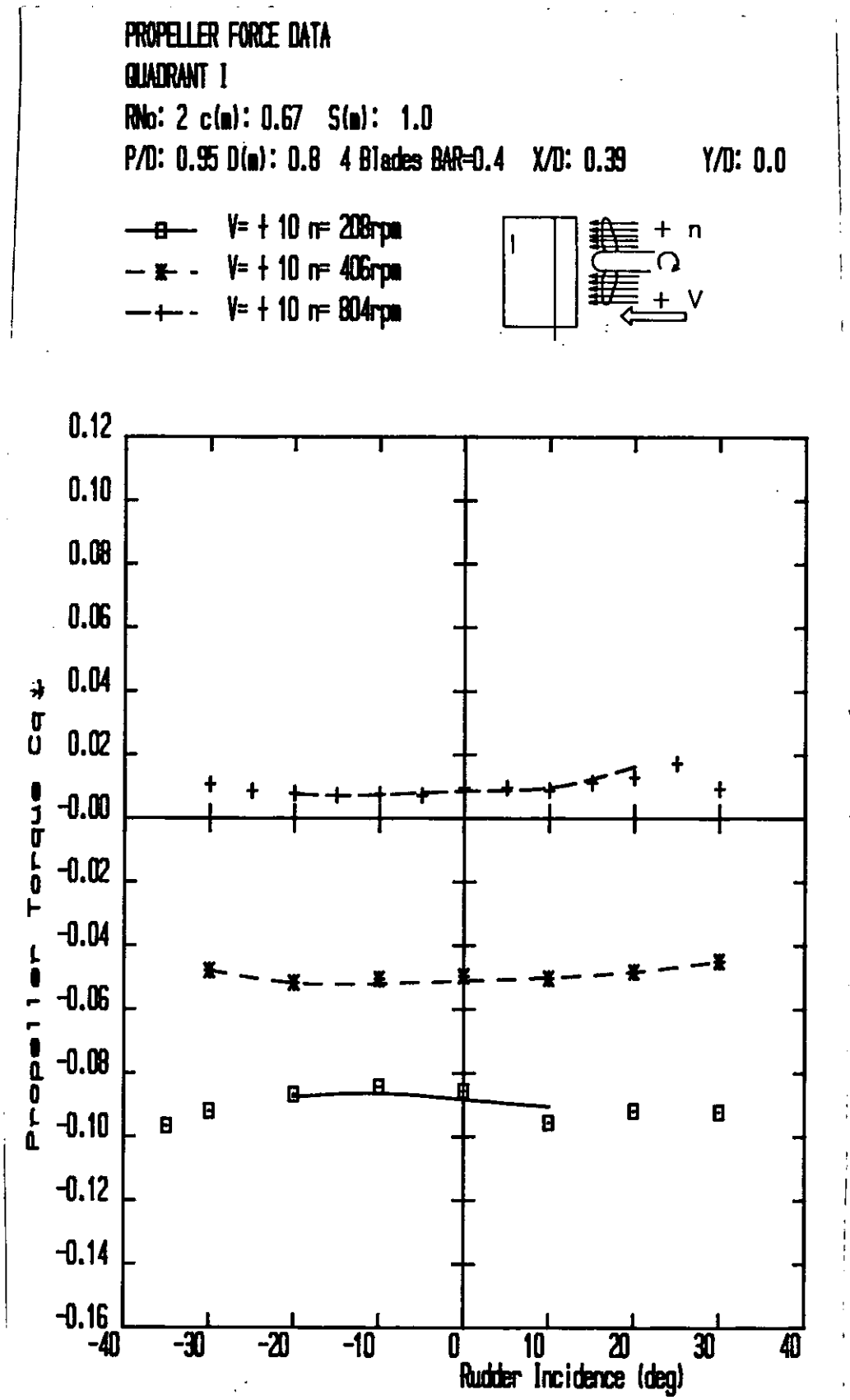


Figure 25 The influence of rudder incidence on propeller torque C_Q* for all four quadrants of operation QUADRANT I

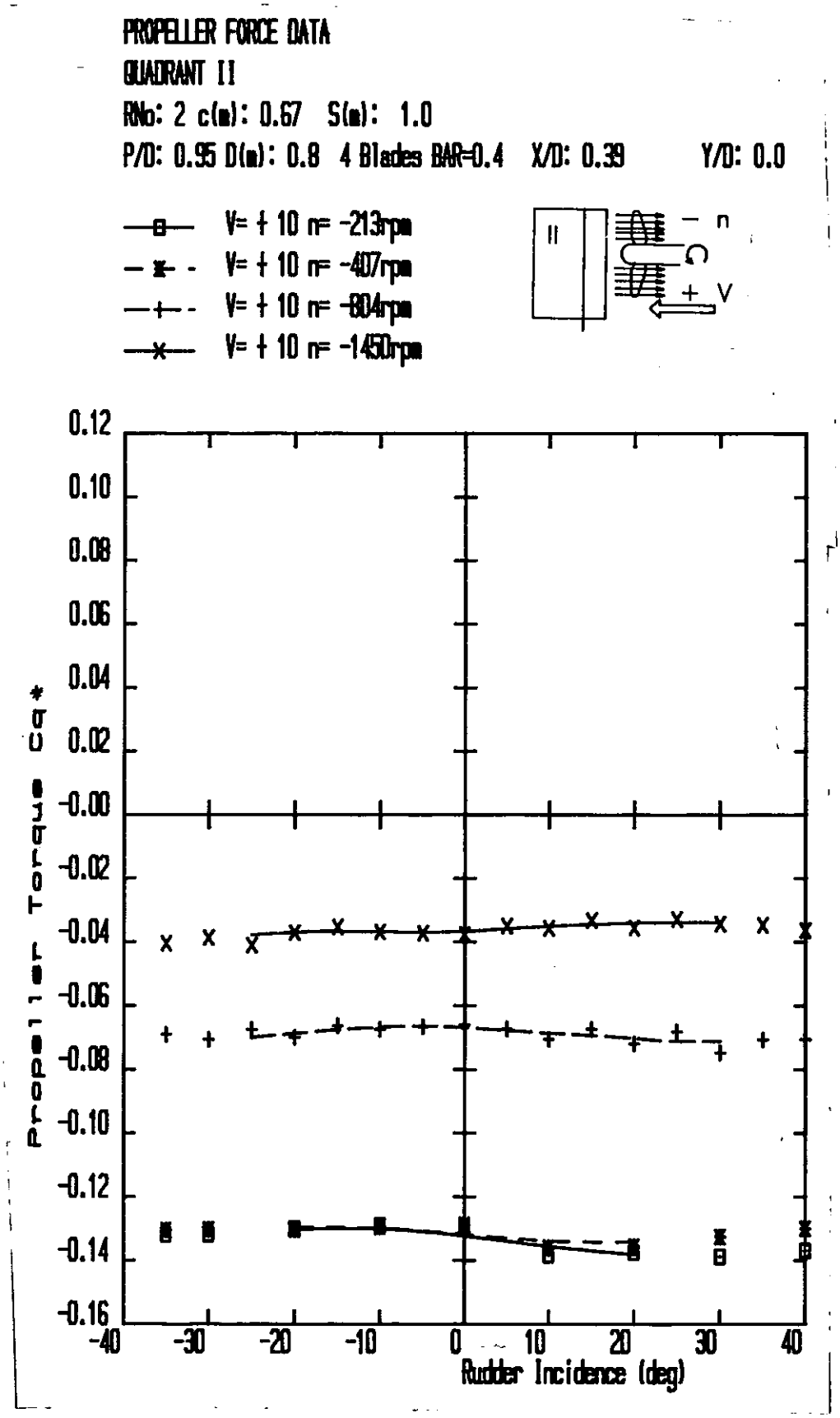


Figure 25 The influence of rudder incidence on propeller torque C_Q* for all four quadrants of operation QUADRANT II

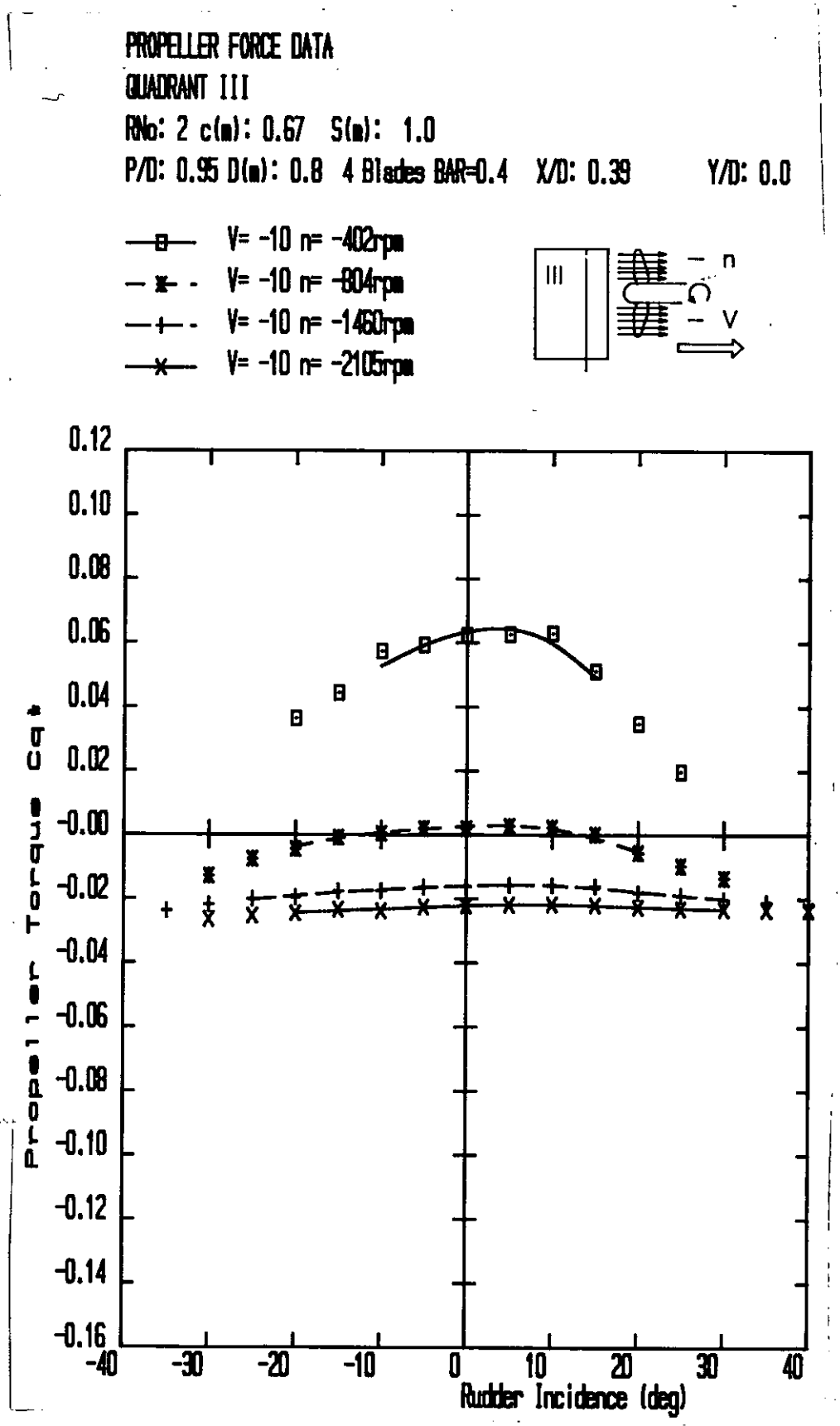


Figure 25 The influence of rudder incidence on propeller torque C_Q* for all four quadrants of operation QUADRANT III

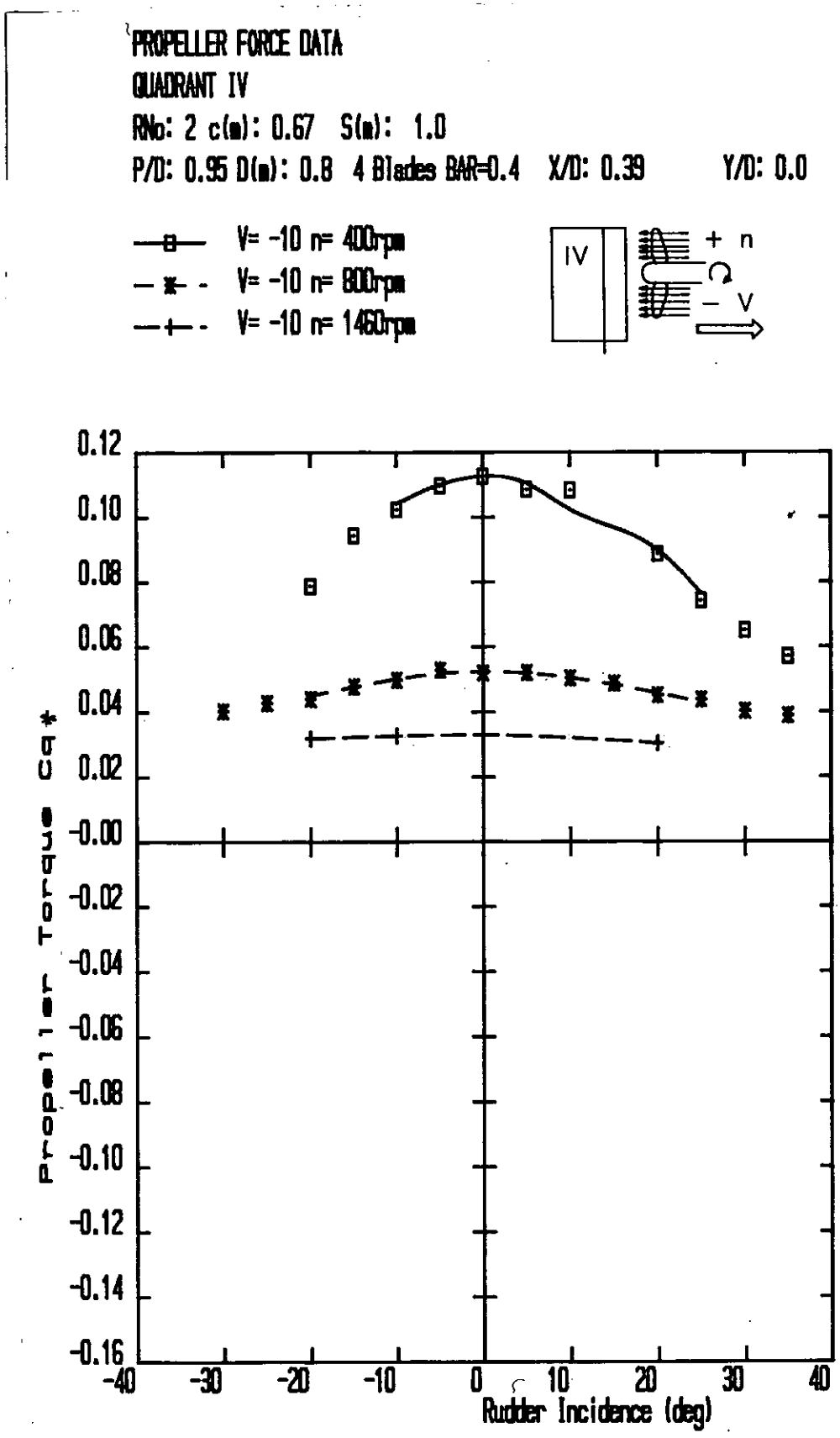


Figure 25 The influence of rudder incidence on propeller torque C_Q* for all four quadrants of operation QUADRANT IV

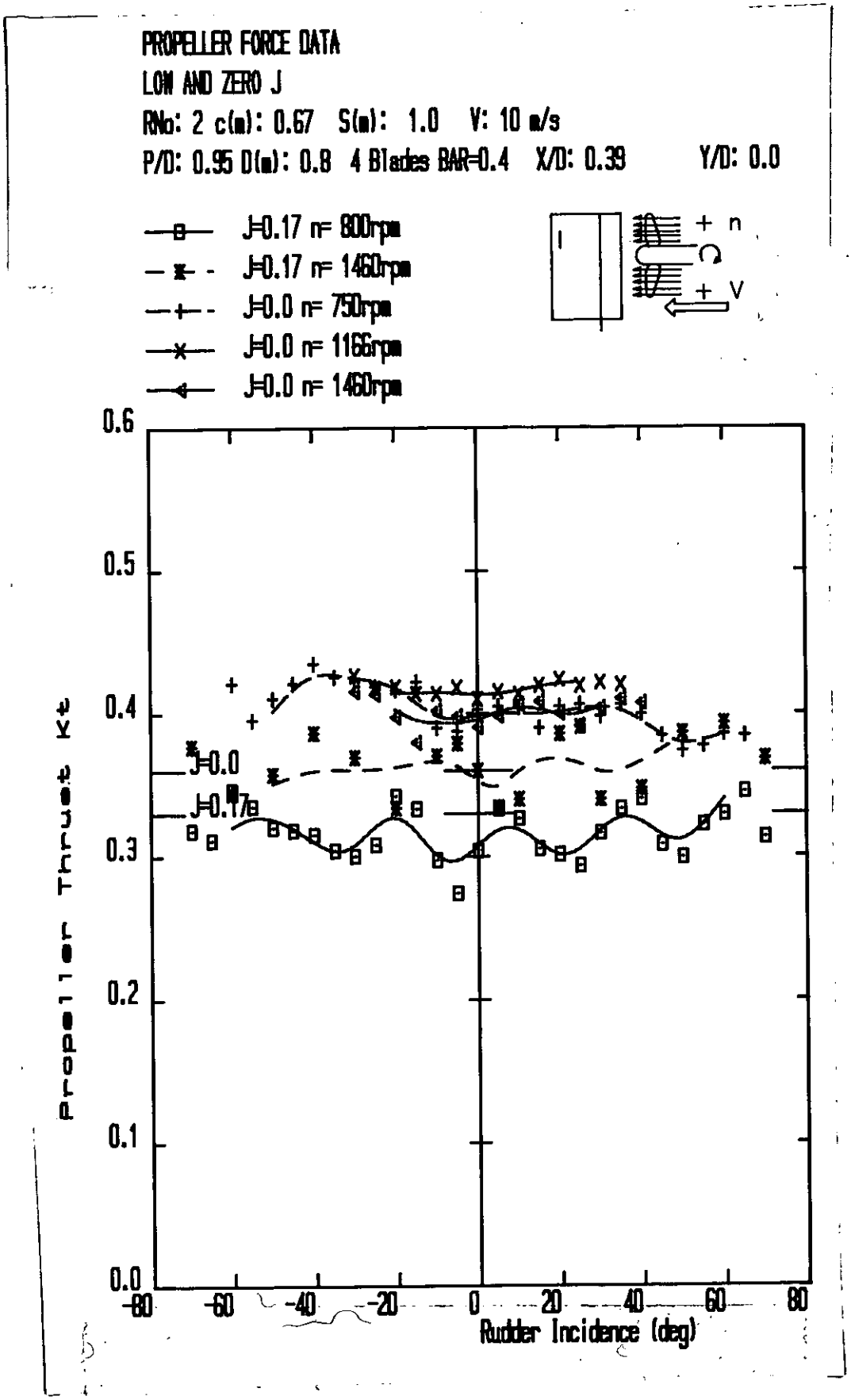


Figure 26 Influence of all-movable rudder incidence on propeller thrust for at low (J=0.17) and zero propeller advance ratio

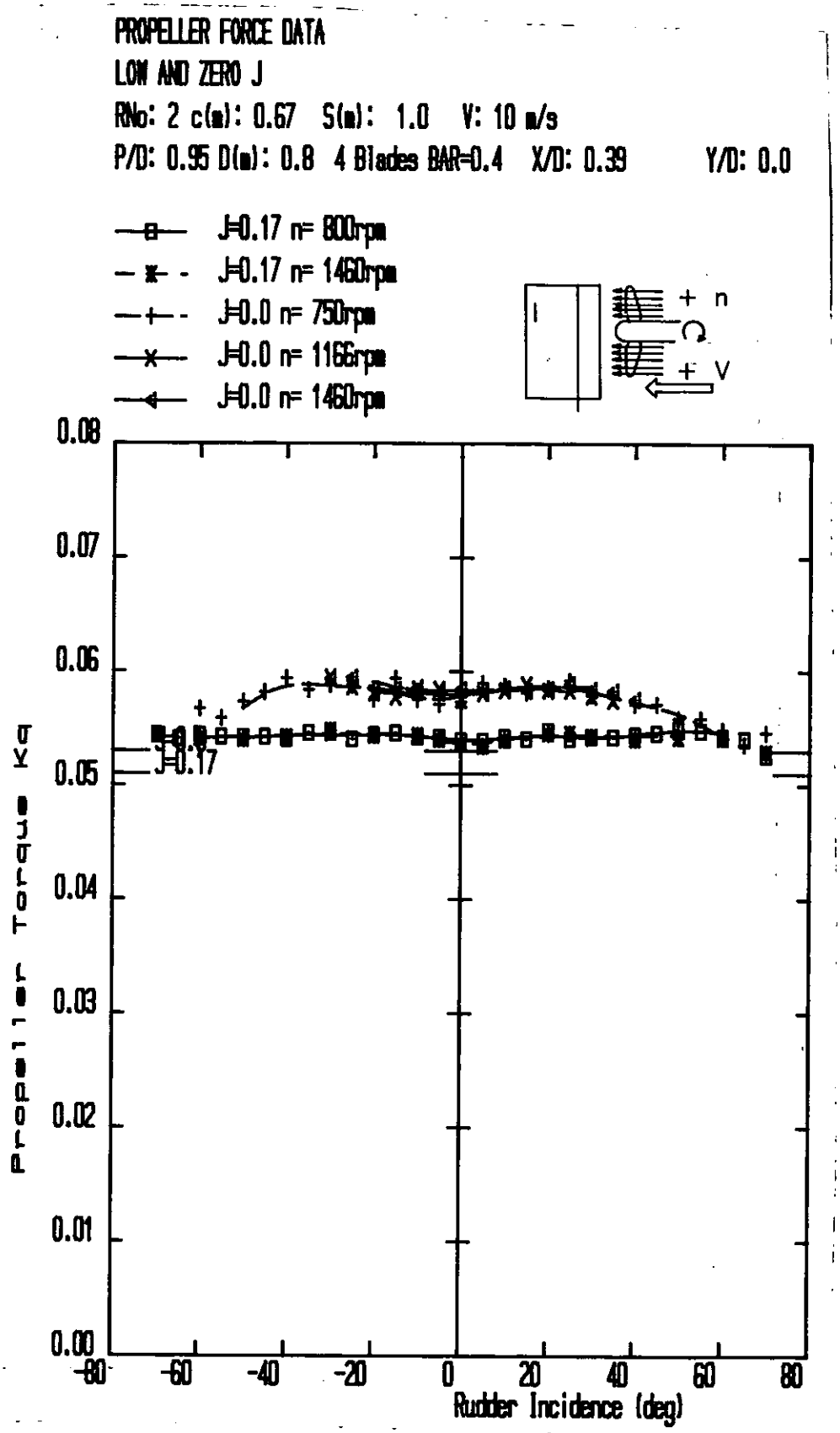


Figure 27 Influence of all-movable rudder incidence on propeller torque for at low (J=0.17) and zero propeller advance ratio

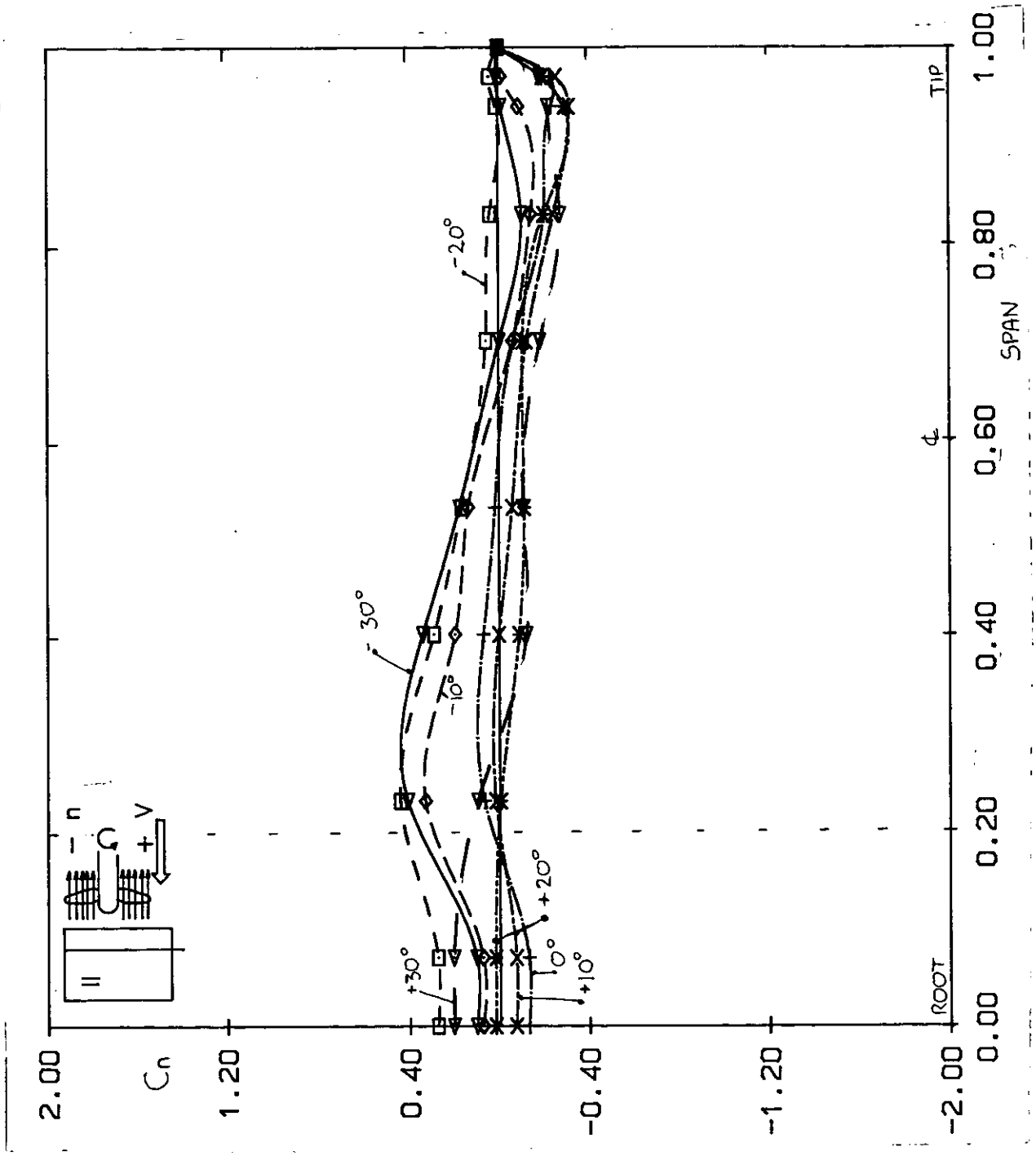


Figure 30 Variation with rudder incidence of the spanwise distribution of local section Cn of Rudder No. 2 at -800 rpm and +10m/s (2nd Quadrant)

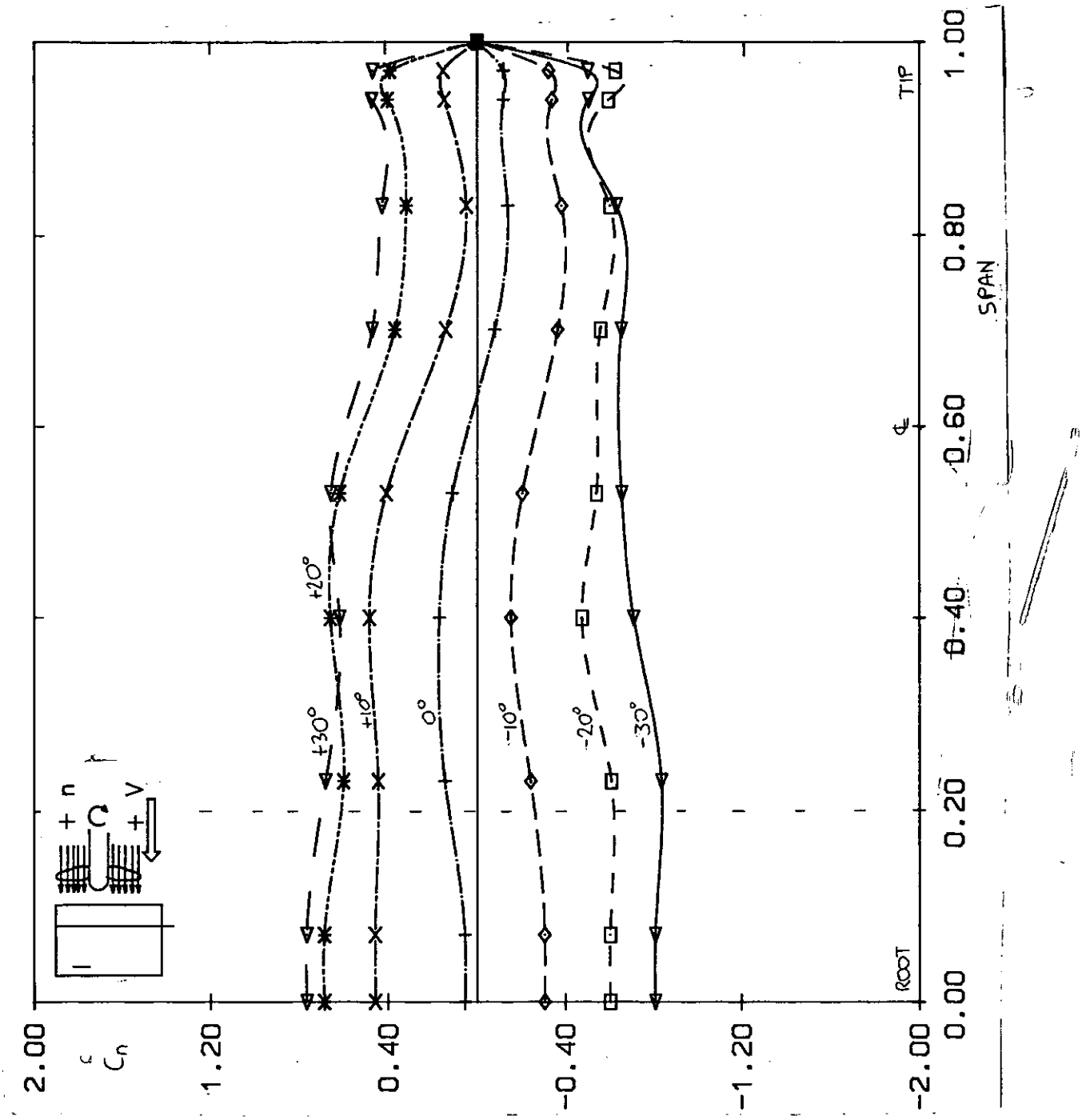


Figure 28 Variation with rudder incidence of the spanwise distribution of local section Cn of Rudder No. 2 at +400 rpm and +10m/s (1st Quadrant)

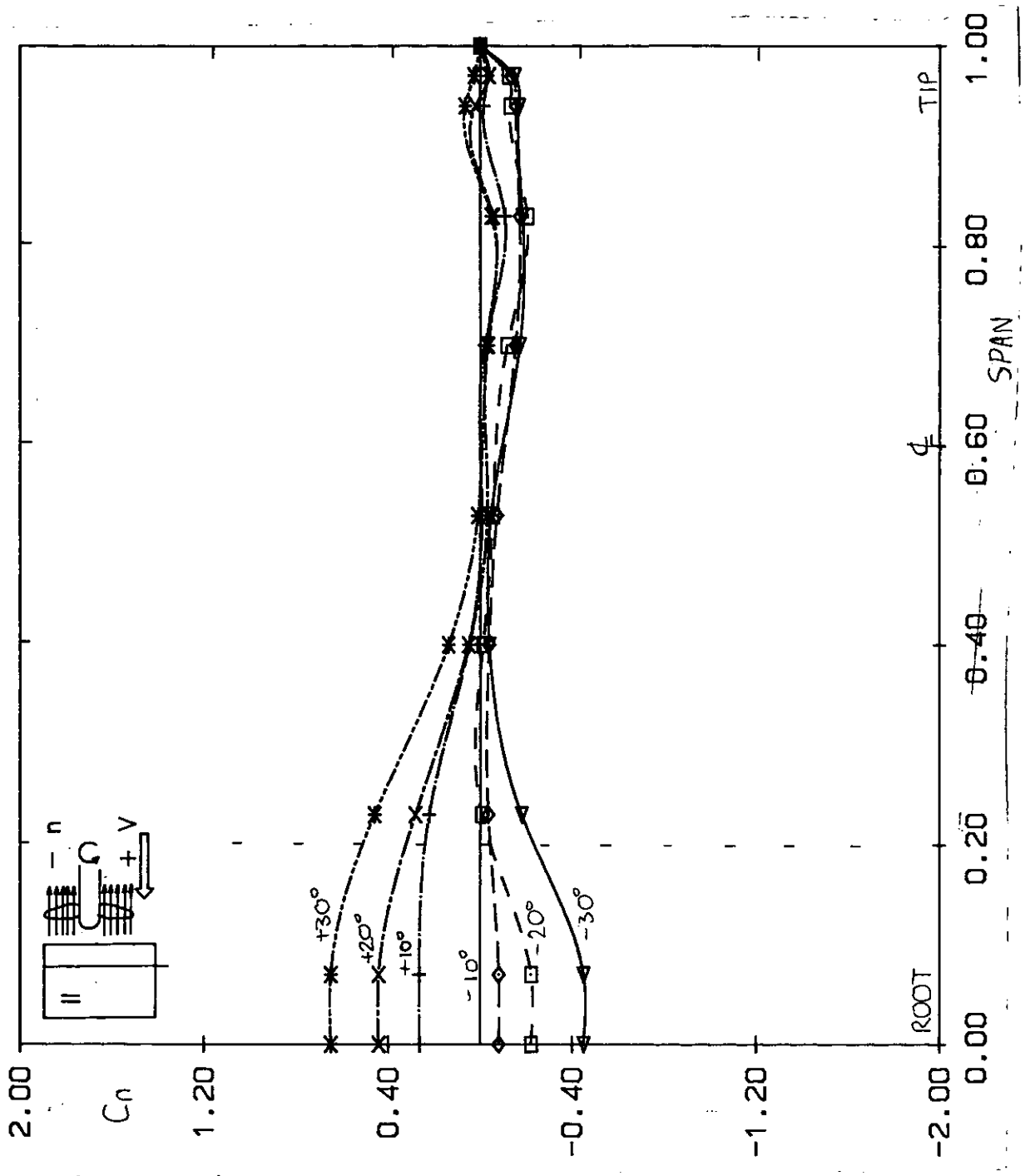


Figure 29 Variation with rudder incidence of the spanwise distribution of local section Cn of Rudder No. 2 at -400 rpm and +10m/s (2nd Quadrant)

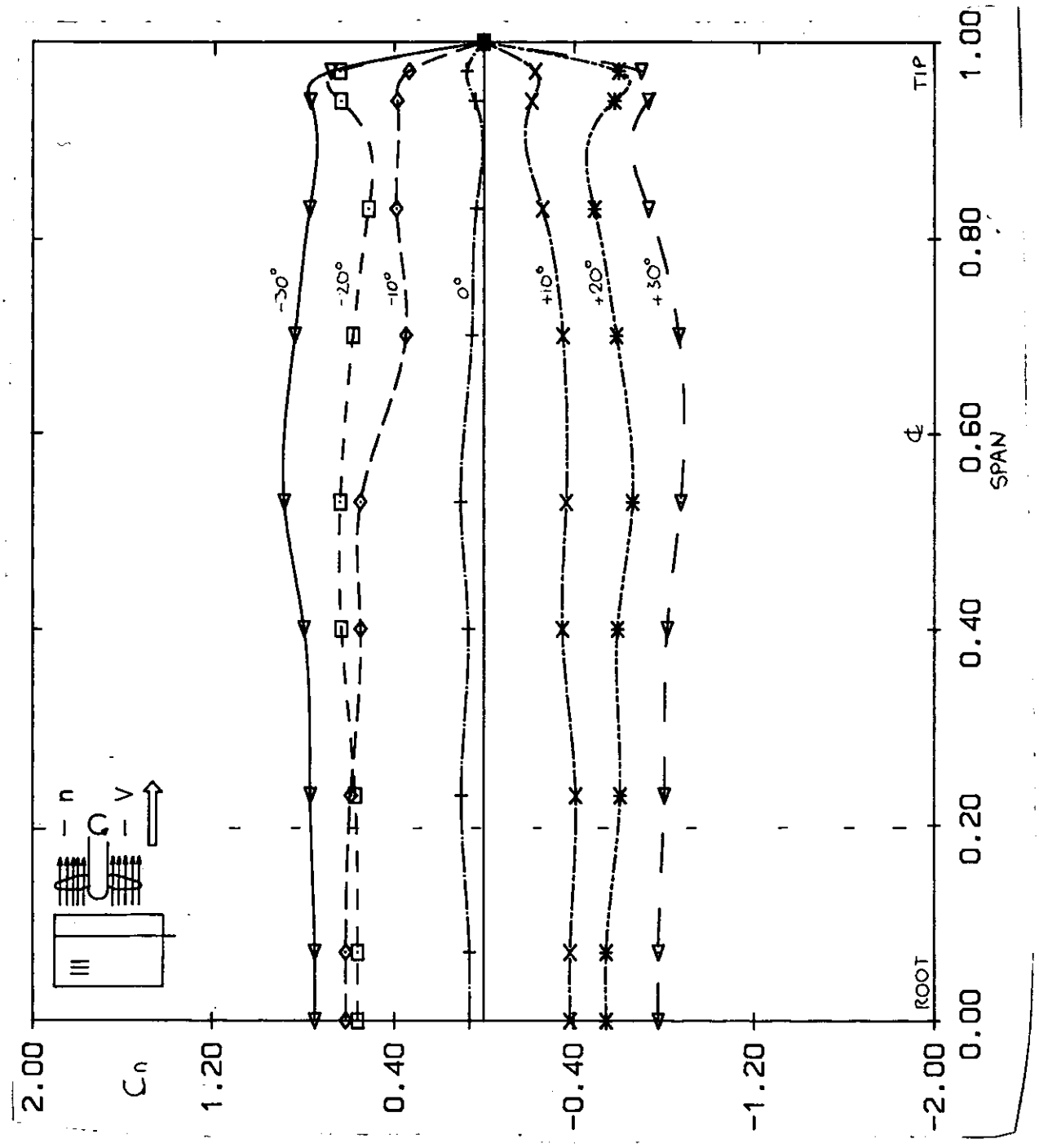


Figure 31 Variation with rudder incidence of the spanwise distribution of local section Cn of Rudder No. 2 at -800 rpm and -10m/s (3rd Quadrant)

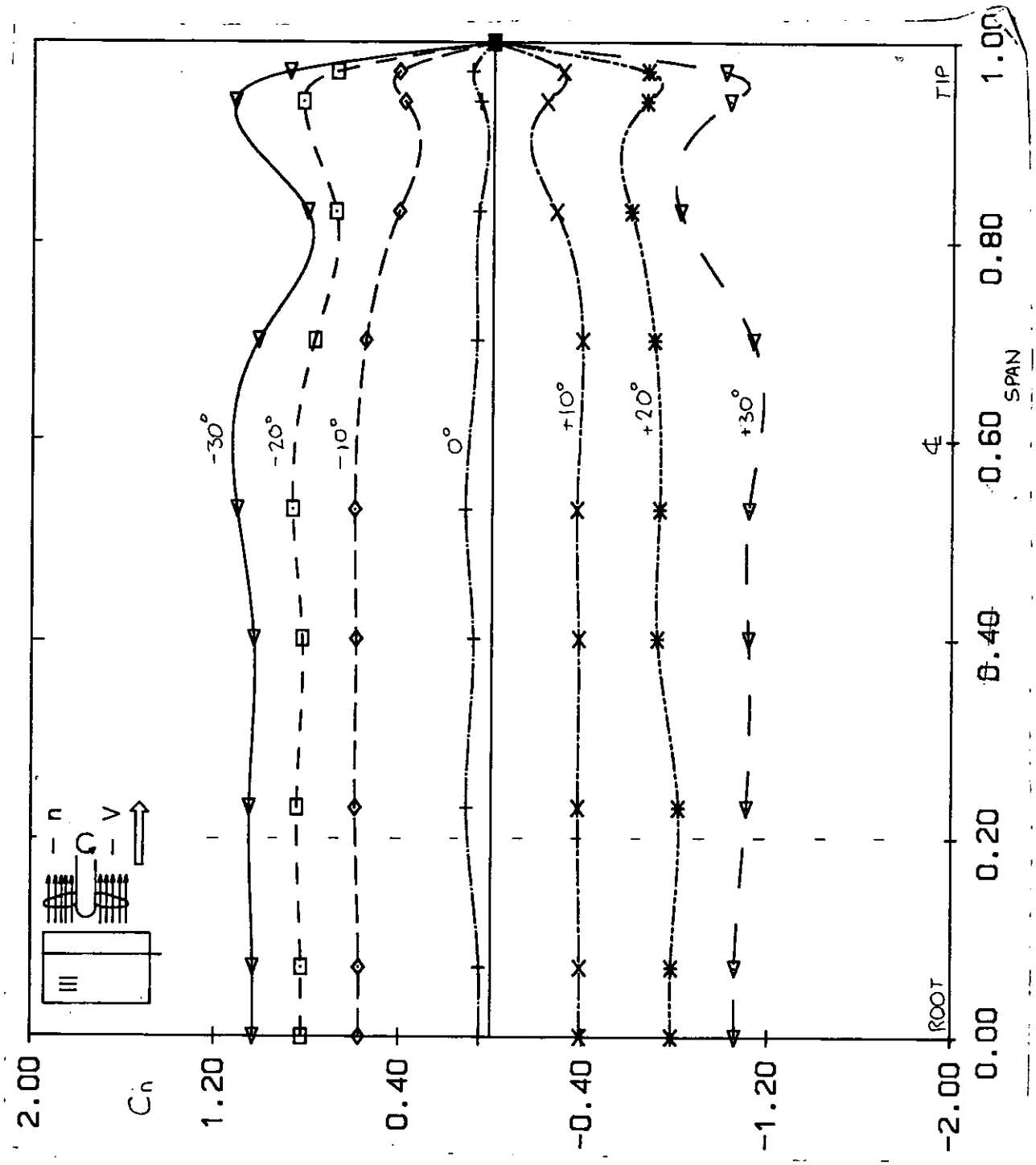


Figure 32 Variation with rudder incidence of the spanwise distribution of local section Cn of Rudder No. 2 at -1460 rpm and -10m/s (3rd Quadrant)

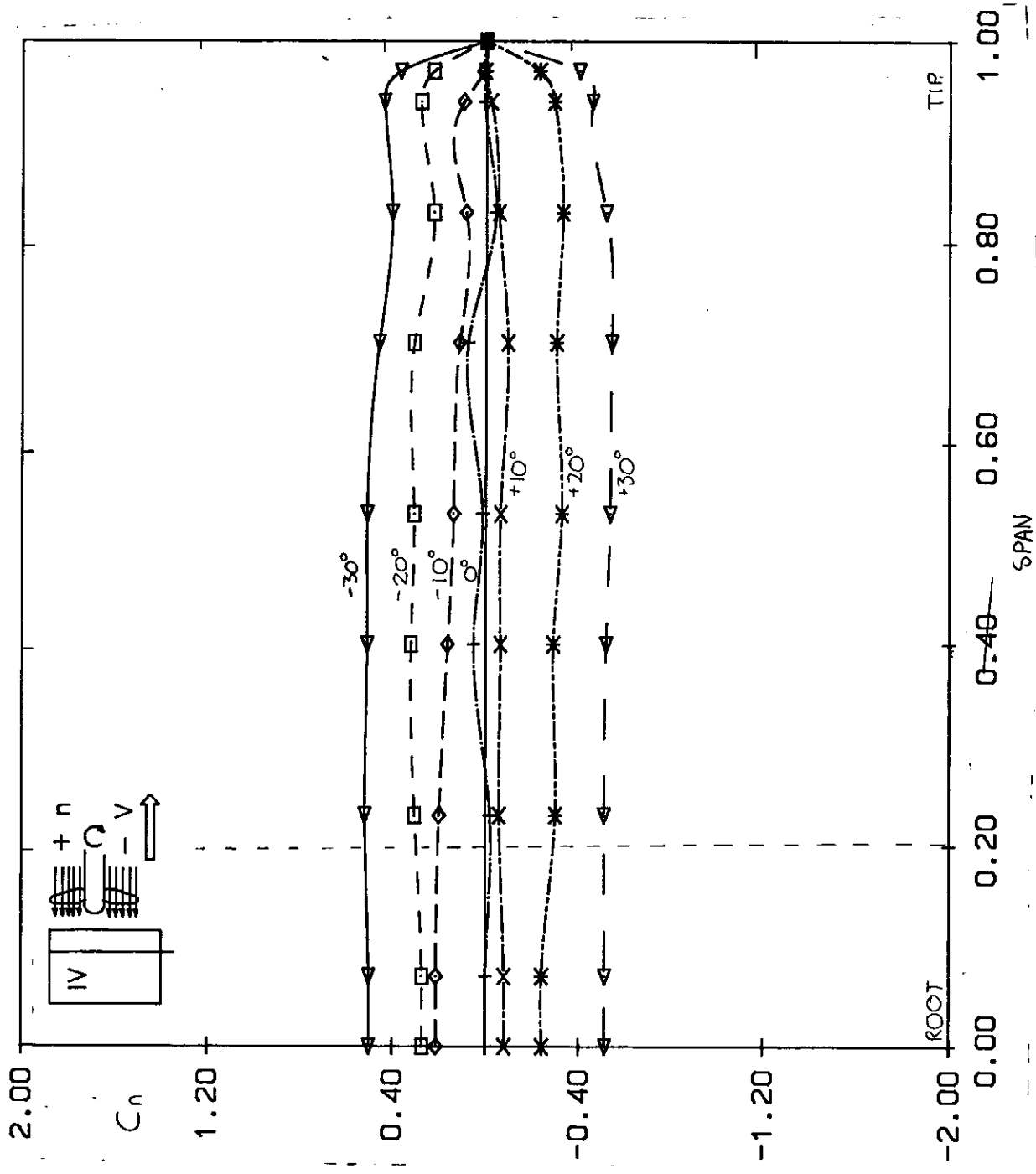


Figure 33 Variation with rudder incidence of the spanwise distribution of local section Cn of Rudder No. 2 at +800 rpm and -10m/s (4th Quadrant)

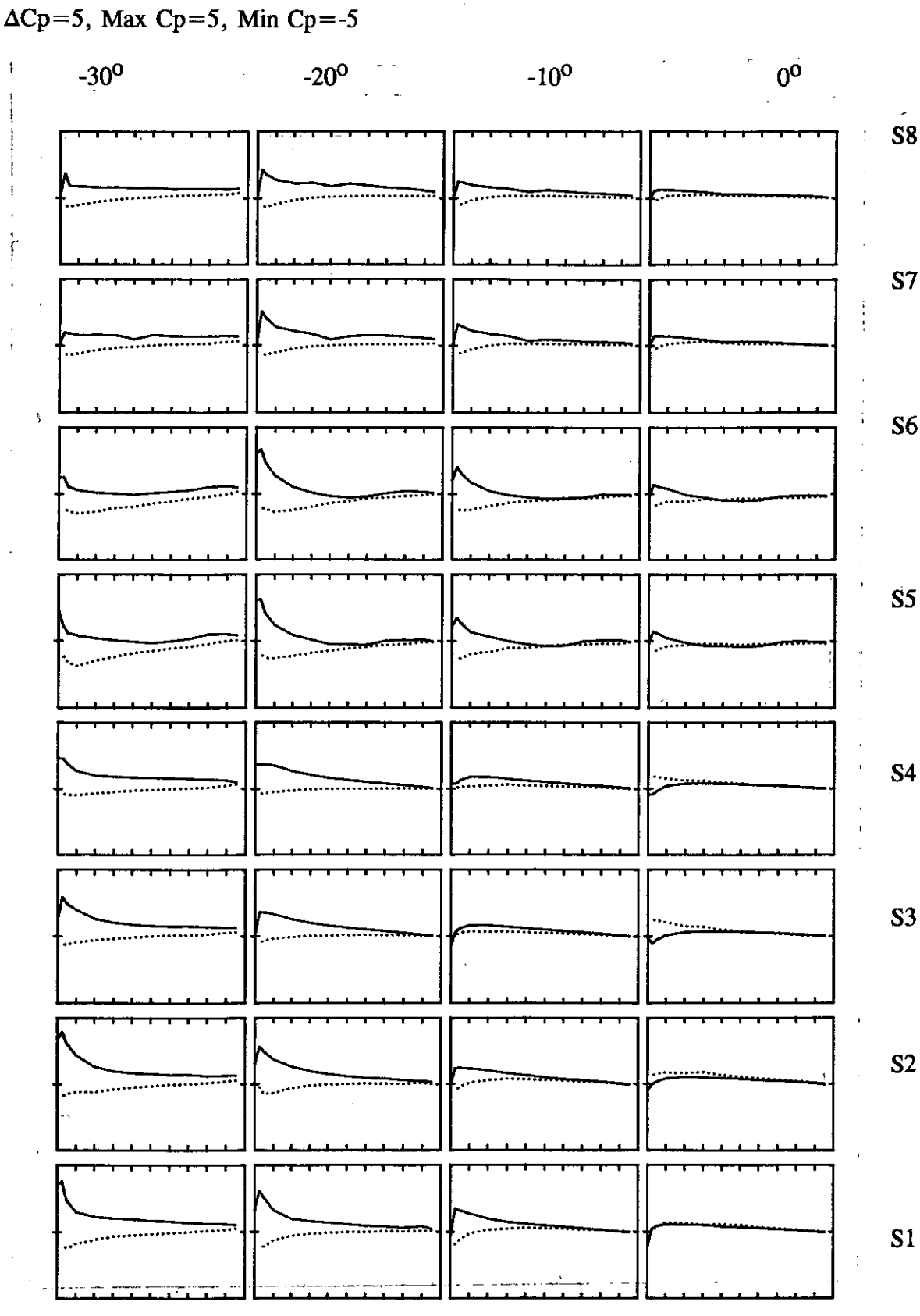


Figure 34 Chordwise pressure distributions at 8 spanwise positions for Rudder No. 2 at +400 rpm and +10m/s for rudder incidences of -30° to 0°(Quadrant I)

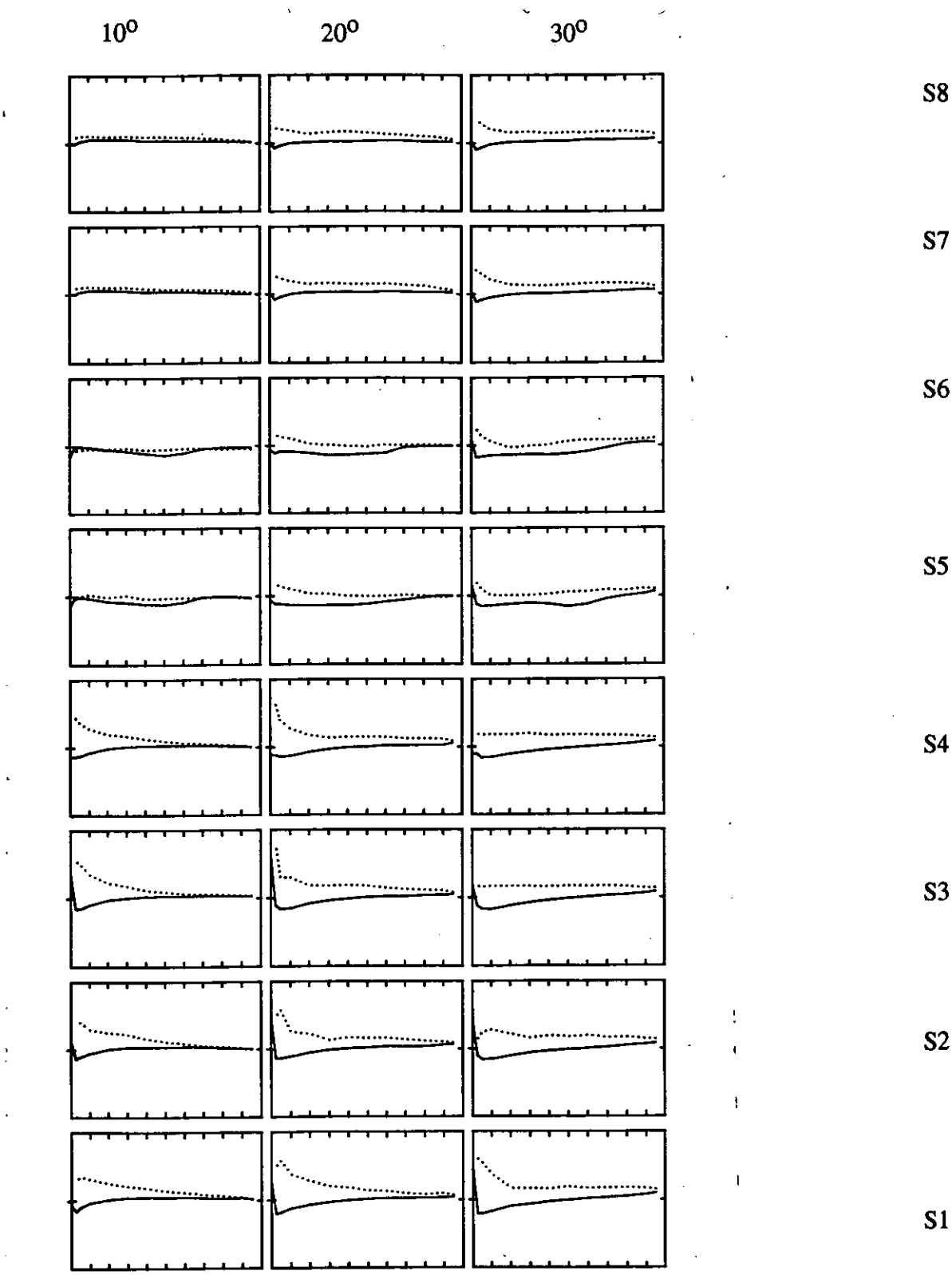


Figure 34 Chordwise pressure distributions at 8-spanwise positions for Rudder No. 2 at +400 rpm and +10m/s for rudder incidences of 10^{o} to 30^{o}(Quadrant I)

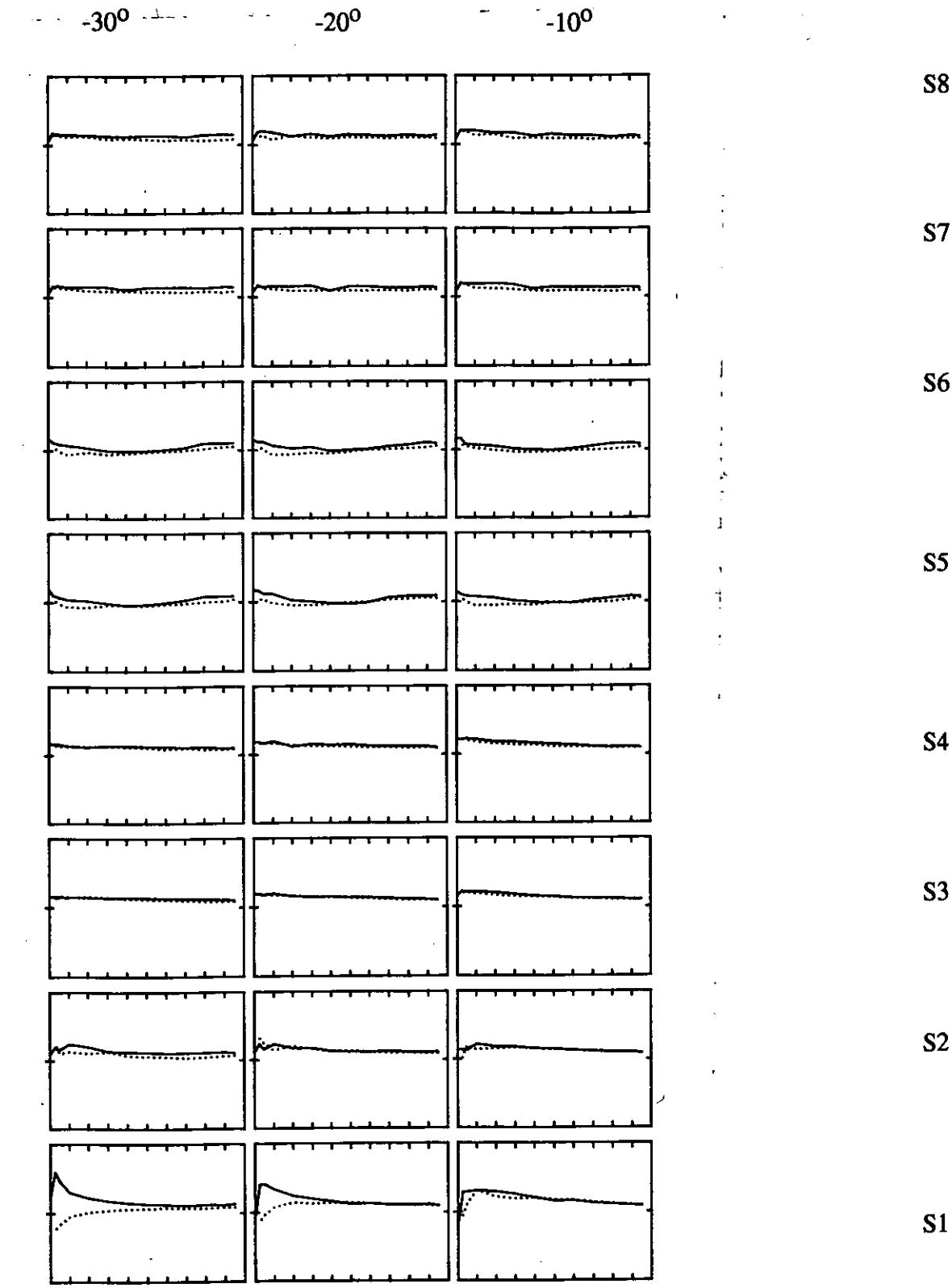


Figure 35 Chordwise pressure distributions at 8 spanwise positions for Rudder No. 2 at -400 rpm and +10m/s for rudder incidences of -30° to 0°(Quadrant II)

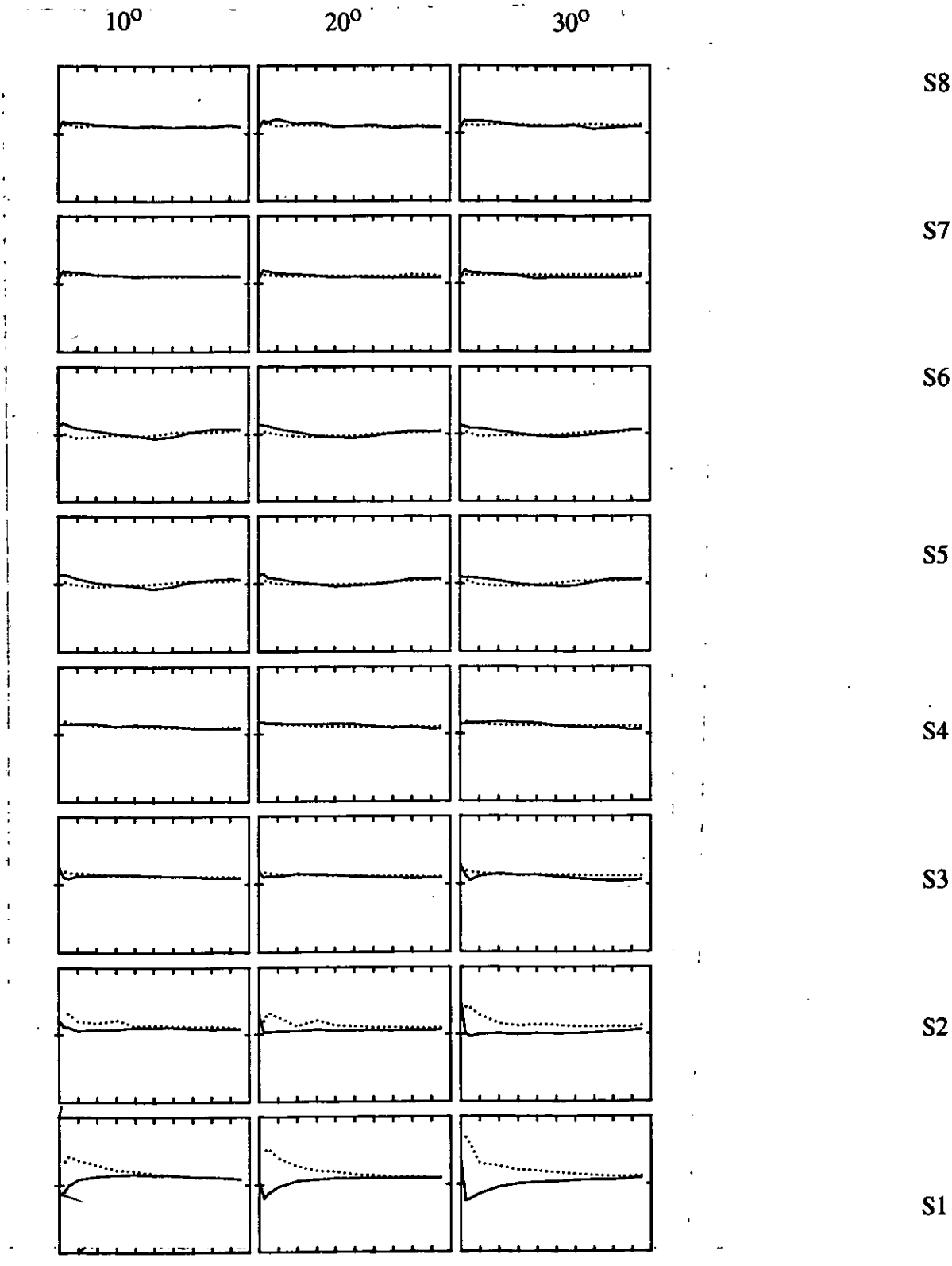


Figure 35 Chordwise pressure distributions at 8 spanwise positions for Rudder No. 2 at -400 rpm and +10m/s for rudder incidences of 10^{o} to 30^{o}(Quadrant II)

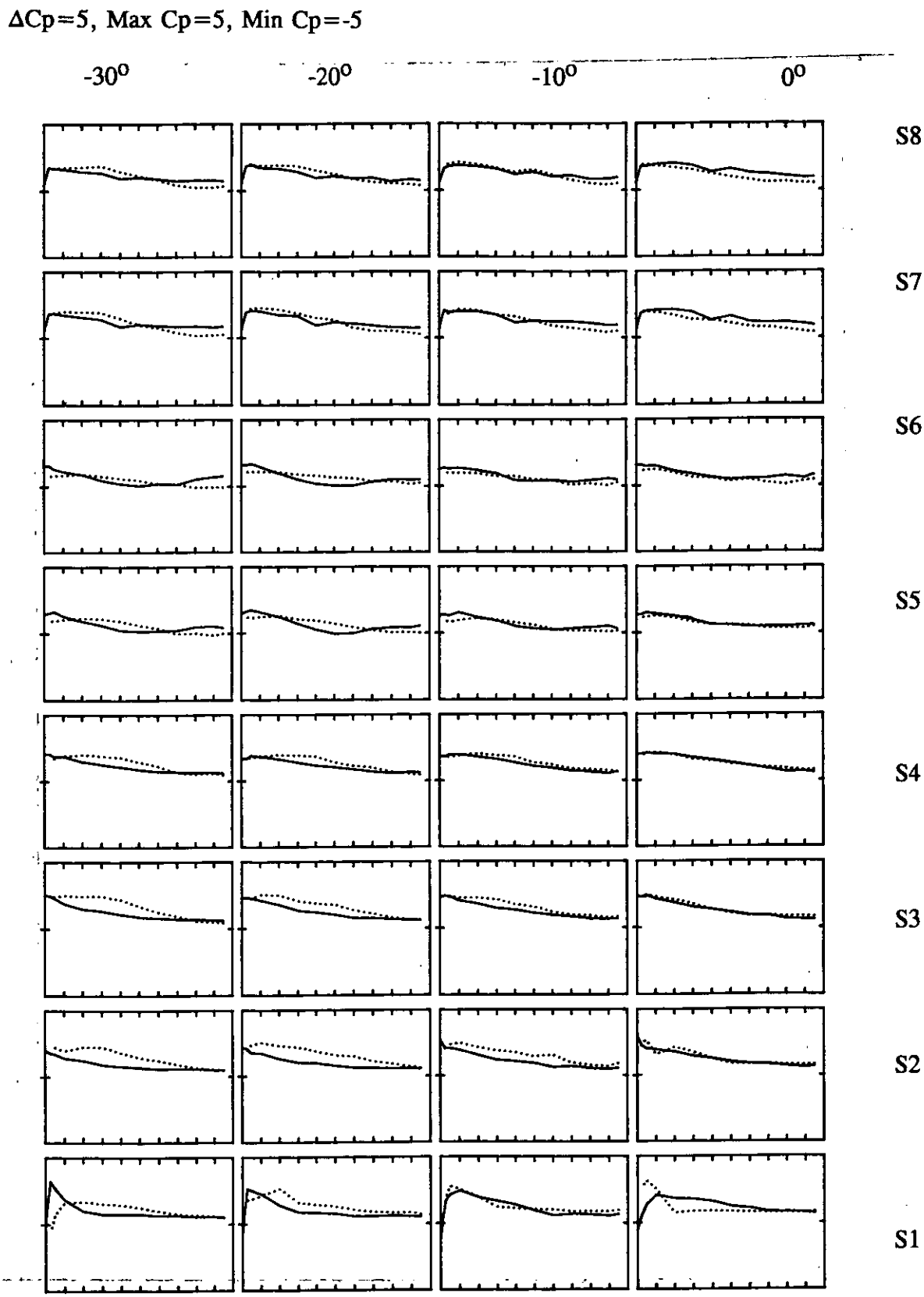


Figure 36 Chordwise pressure distributions at 8 spanwise positions for Rudder No. 2 at -800 rpm and +10m/s for rudder incidences of -30° to 0°(Quadrant II)

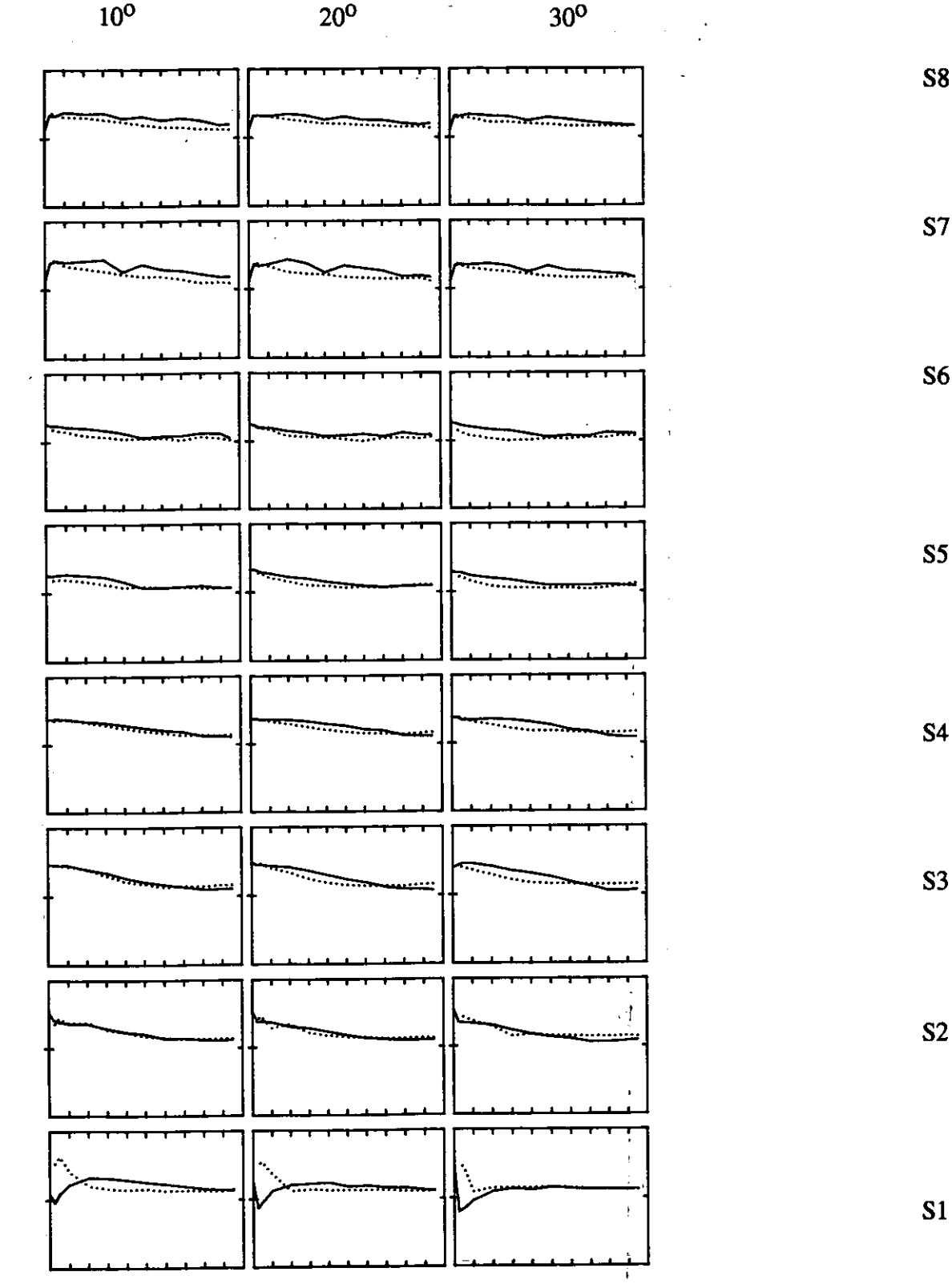


Figure 36 Chordwise pressure distributions at 8 spanwise positions for Rudder No. 2 at -800 rpm and +10m/s for rudder incidences of 10° to 30°(Quadrant II)

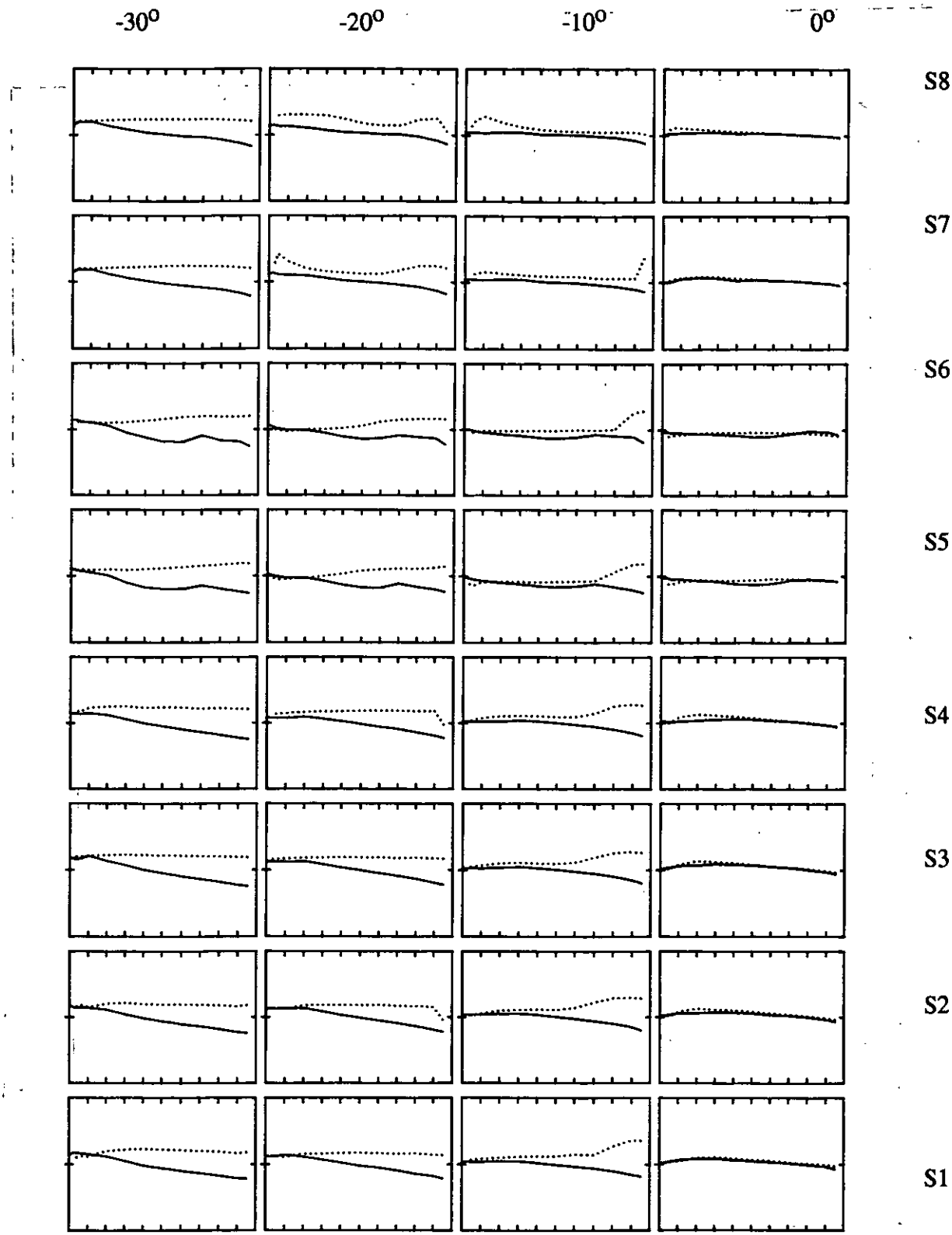


Figure 37 Chordwise pressure distributions at 8 spanwise positions for Rudder No. 2 at -800 rpm and -10m/s for rudder incidences of -30° to 0°(Quadrant III)

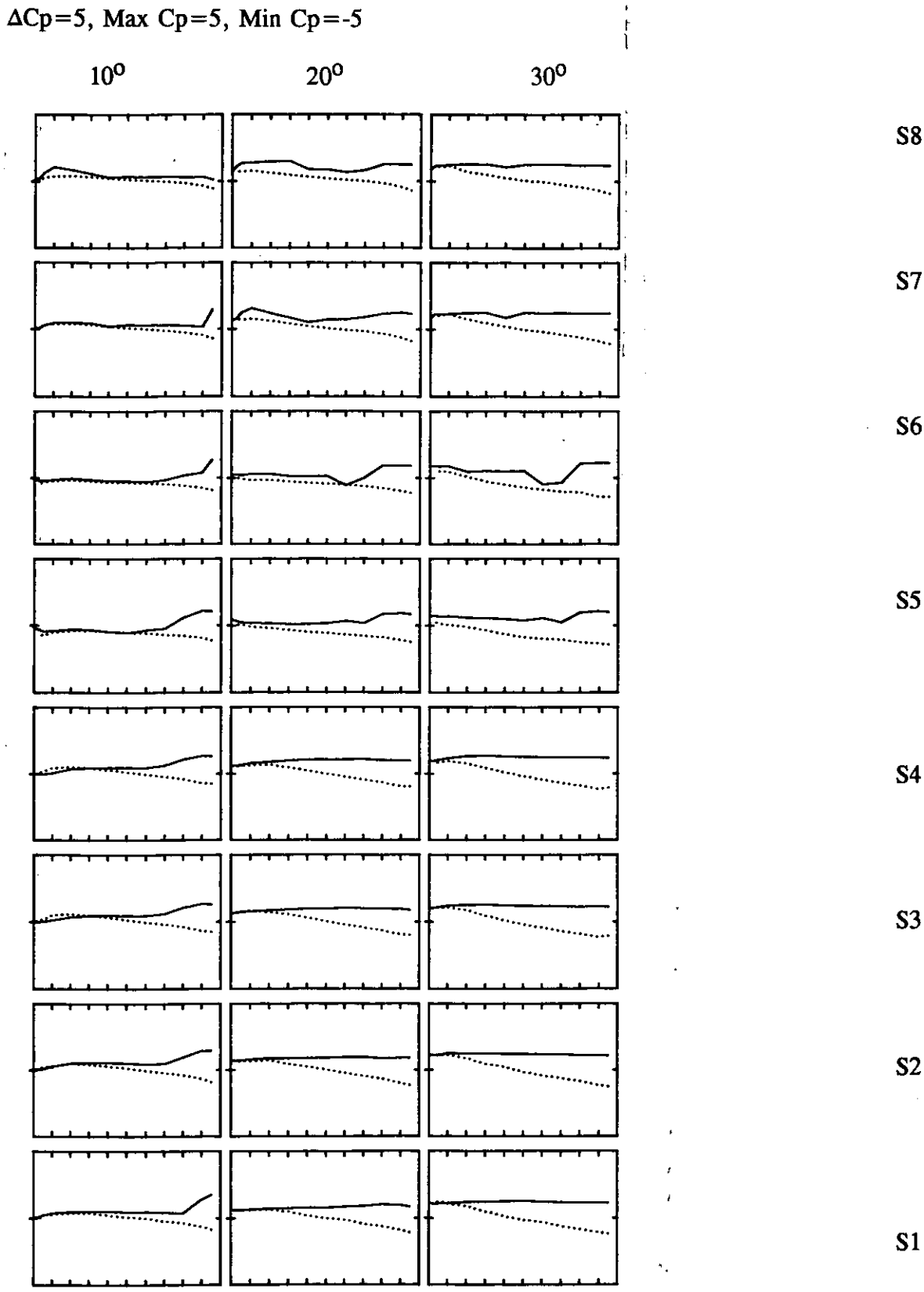


Figure 37 Chordwise pressure distributions at 8 spanwise positions for Rudder No. 2 at -800 rpm and -10m/s for rudder incidences of 10^{o} to 30^{o}(Quadrant III)

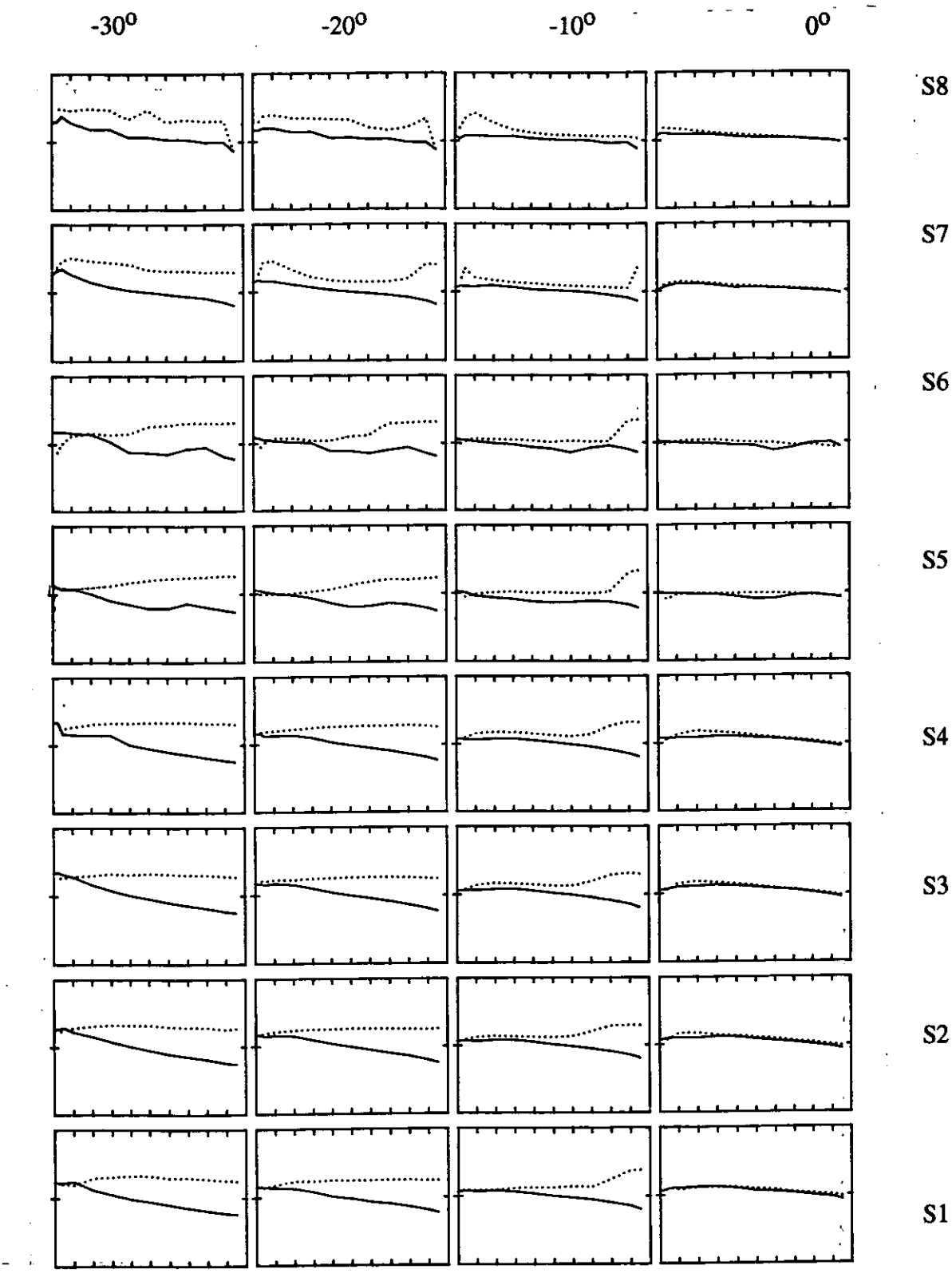


Figure 38 Chordwise pressure distributions at 8 spanwise positions for Rudder No. 2 at -1460 rpm and -10m/s for rudder incidences of -30° to 0°(Quadrant III)

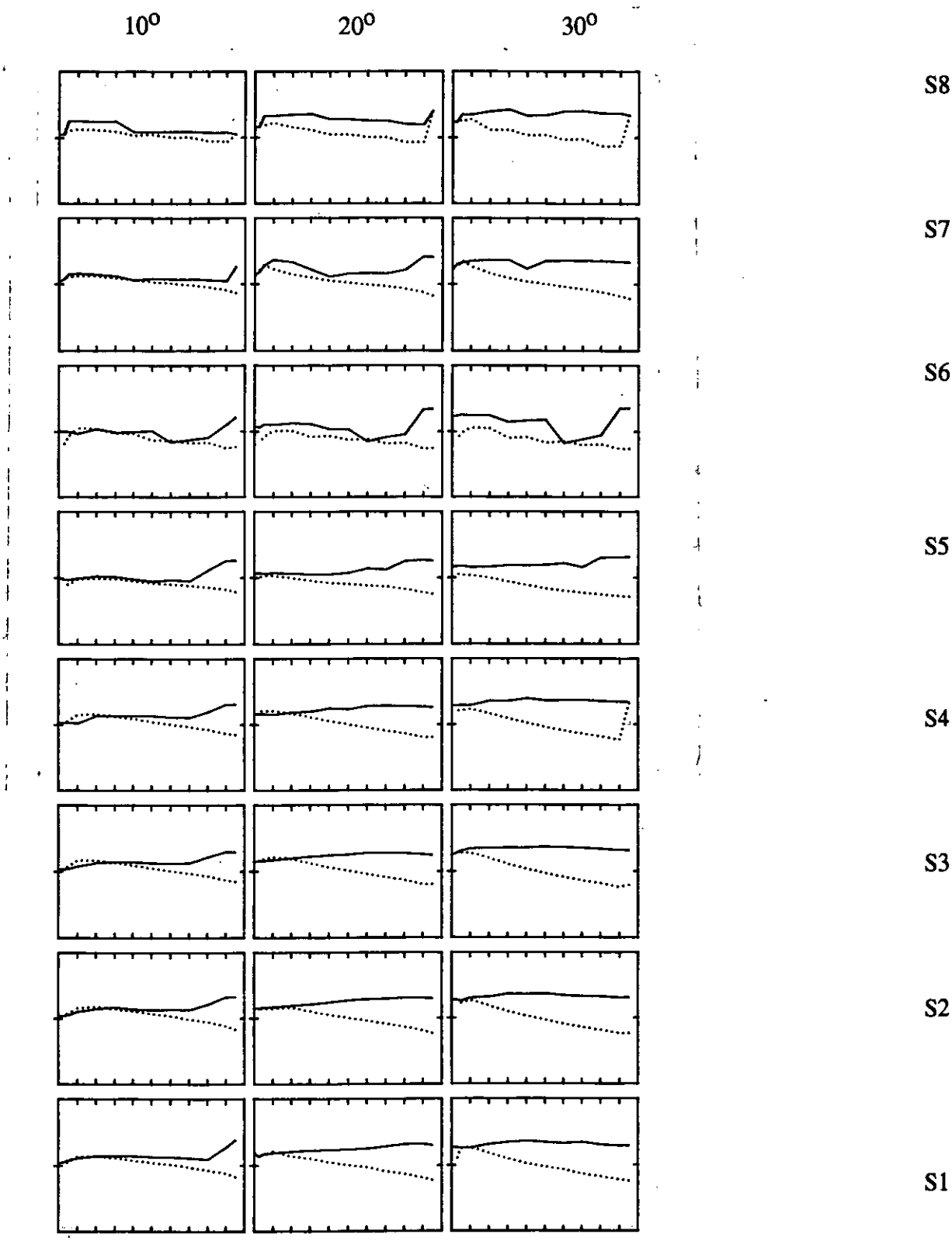


Figure 38 Chordwise pressure distributions at 8 spanwise positions for Rudder No. 2 at -1460 rpm and -10m/s for rudder incidences of 10^{o} to 30^{o}(Quadrant III)

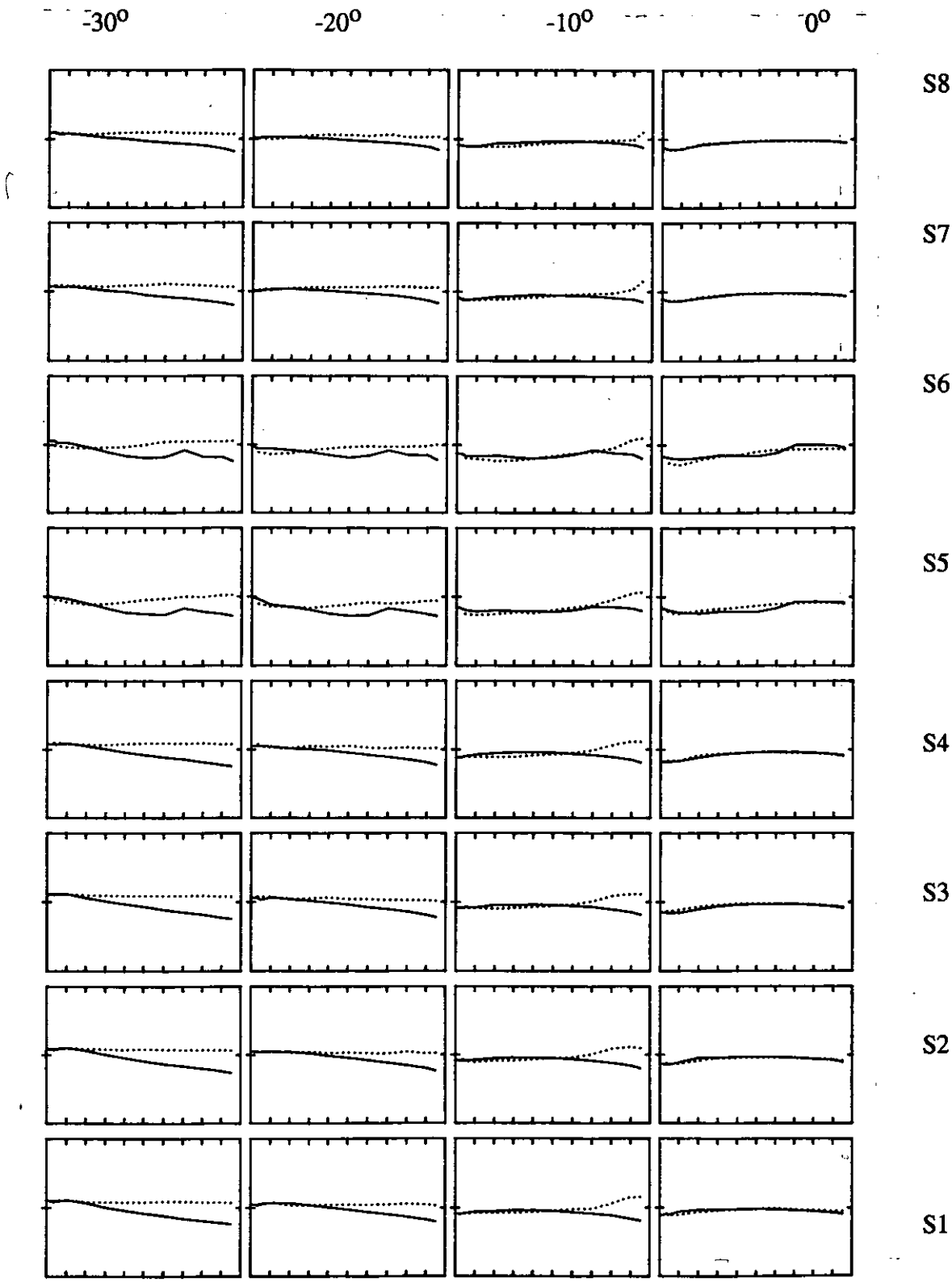


Figure 39 Chordwise pressure distributions at 8 spanwise positions for Rudder No. 2 at +800 rpm and -10m/s for rudder incidences of -30° to 0°(Quadrant IV)

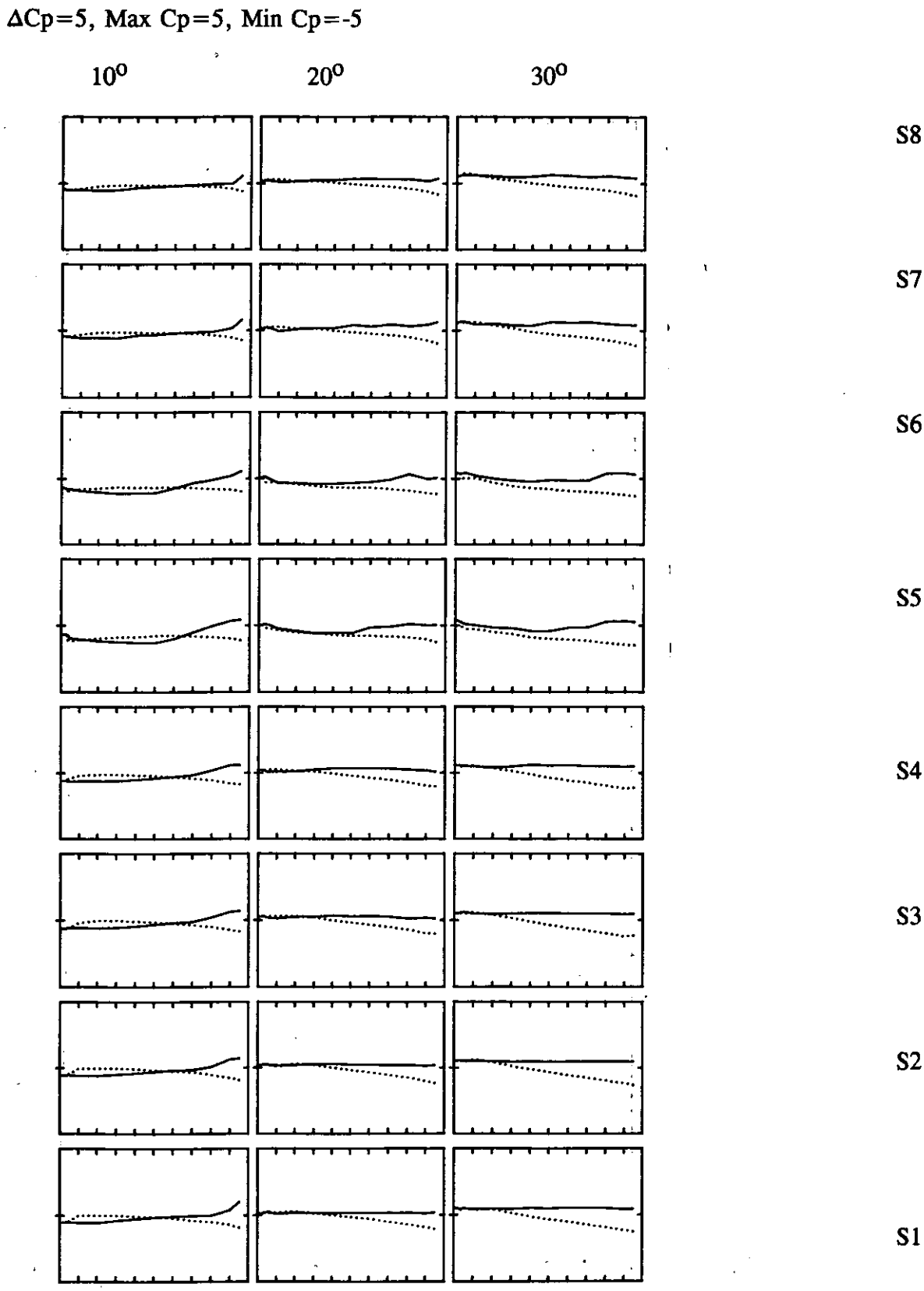


Figure 39 Chordwise pressure distributions at 8 spanwise positions for Rudder No. 2 at +800 rpm and -10m/s for rudder incidences of 10° to 30°(Quadrant IV)