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EFFECT OF CANARD POSITION AND WING LEADING-EDGE FLAP DEFLECTION ON WING BUFFET

AT TRANSONIC SPEEDS

By Blair B. Gloss, William P. Henderson, and Jarrett K. Huffman

April 16, 1975



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NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

EFFECT OF CANARD POSITION AND WING LEADING-EDGE FLAP DEFLECTION ON WING BUFFET AT TRANSONIC SPEEDS

By Blair B. Gloss, William P. Henderson, and Jarrett K. Huffman

SUMMARY

A generalized wind-tunnel model, with canard and wing planform typical of highly maneuverable aircraft, was tested in the Langley 8-foot transonic pressure tunnel at Mach numbers from 0.70 to 1.20 to determine the effects of canard location and wing leading-edge flap deflection on the wing buffet characteristics. The major results of this investigations may be summarized as follows. The addition of a canard above the wing chord plane, for the configuration with leading-edge flaps undeflected, allowed this configuration to obtain substantially higher total configuration lift coefficients before buffet onset occurs than the configuration with the canard off and leading-edge flaps undeflected. However, the addition of the canard did not substantially affect the lift of the wing at which buffet onset occurs, for the configurations with the leading-edge flaps undeflected, but the wing buffet intensity was substantially lower for the canard wing configuration than the wing alone configuration. The low canard configuration generally displayed the poorest buffet characteristics. Deflecting the wing leading-edge flaps substantially improved the wing buffet characteristics for canard-off configurations. The addition of the high canard did not appear to substantially improve the wing buffet characteristics of the wing with leadingedge flaps deflected.

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INTRODUCTION

The National Aeronautics and Space Administration is currently conducting wind-tunnel investigations to provide a data base for the use of determining the desirability of employing close-coupled canard surfaces on highly maneuverable aircraft. The use of canards offers several attractive features, such as increased trimmed lift capability and the potential for reduced trimmed drag. (Refs. 1-6) In addition, the geometric characteristics of close-coupled canard configurations offer a potential for improved longitudinal progression of crosssectional area; this improvement could result in reduced wave drag at low supersonic speeds. References 7-11 present the results of several additional investigations of close-coupled canard wing configurations at subsonic and transonic speeds. Since the maneuver and performance capability of aircraft engaged in air-to-air combat is often limited by flow separation manifesting itself as wing buffeting (reference 12), the present study was conducted to determine the effect of close-coupled canard surfaces on wing buffet onset characteristics at transonic speeds. A generalized wind-tunnel model which had a wing buffet strain gage installed in one wing was tested in the Langley 8-foot transonic pressure tunnel at Mach numbers from 0.70 to 1.20 at angles of attack from -40° to 20° at 0° side slip.

SYMBOLS

The International System of Units with the U.S. Customary Units presented in parenthesis, is used for the physical quantities in this paper. Measurements and calculations were made in U.S. Customary Units. The data presented in this

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report are referred	to the stability axis system with the exception of axial
force and normal for	rce which are referred to the body-axis system.
À.	aspect ratio (2.5), b ² /S _w
Ъ.	wing spang 50.8 cm (20 in)
ē	wing mean geometric chord, 23.32 cm (9.18 in)
C _A	axial force coefficient, $\frac{Axial force}{qS_w}$
с _р	drag coefficient, $\frac{\text{Drag}}{qS_{W}}$
0 <u>.</u> 1	lift coefficient, Lift qS _w
C _{L,DIF}	wing lift (main balance lift - canard balance lift)
C _{M,WSG}	root-mean-square moment of wing bending gage
M	free-stream Mach number
ġ.	free-stream dynamic pressure lb/ft ²
^S c	canard area (exposed), 288.71 cm^2 (44.75 in^2)
S.v.	reference area of wing with leading and trailing edges extended to plane of symmetry, 1032.26 cm ² (160.00 in ²)
2	vertical; distance between the chord planes of the canard and wing, positive up.
α F	angle of attack, deg.
A.w	leading-edge sweep angle of wing, deg.
Å _e	leading-edge sweep angle of canard, deg.
٥	leading edge flap deflection (positive direction leading edge down), deg.
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DESCRIPTION OF MODEL

A sketch of the general research model showing the wing leading edge flap locations and wing buffet strain gage location is presented in figure 1. Table I contains the pertinent geometric parameters associated with this model.

The untwisted wing planform used on this model had a leading edge sweep angle, Λ_w , of 44[°], and a 64A006 airfoil section at the wing root (the root of the wing is taken at the intersection of the fuselage and wing) which varied linearly to a 64A004 airfoil section at the tip. When the wing leading edge flaps were deflected for the present investigation, the deflection angles were as presented in the schedule shown below. The wing buffet gage was aligned

Flap	δ, deg.
; I	4
II	8
III	12
IV	16
V	20

along the fifty percent chord line as indicated in figure 1.

The canard had a leading-edge sweep angle of 51.7° and an exposed area (S_c) of 28.0 percent of the wing reference area (S_w) . The canard was tested in a position of 18.5 percent of the wing mean geometric chord above and below the wing chord plane $(z/\bar{c} = 0.135 \text{ and } -0.185 \text{ respectively})$. Fuselage fairings were required to fair the canard mounting brackets into the body. Thus, there were two fuselage configurations: body fairings on the top for $z/\bar{c} = 0.185$ and body fairings on the bottom for $z/\bar{c} = -0.185$ (see figure 1.)

The canard was untwisted and had uncambered circular arc airfoil sections.

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; The thickness varied linearily from 6 percent of the chord at the root to 4 percent at the tip. The moment reference point was taken to be at fuselage station 59.14 cm (23.29 in). 7 DRIGINAL' PAGE IS DE POOR QUALITY ì

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APPARATUS, TESTS AND CORRECTIONS

This investigation was conducted in the Langley 8-foot transonic pressure tunnel which is a continuous-flow facility (ref. 13). Forces and moments were measured by two internally mounted, six-component strain-gage balances; the relative locations of these balances are shown in figure 1. One balance measured the loads on the forward part of the body (shaded area in figure 1) and is called the canard balance. The second balance, which was housed in the aft section of the model measured the total loads and is referred to as the main balance. There was a small unsealed gap between segments of the fuselage in order to prevent fouling.

Tests were made at Mach numbers of 0.70, 0.90, 0.95, 1.03 and 1.20. The angle-of-attack range was from approximately -4° to 20° at 0° sideslip. Angles of attack have been corrected for the effects of sting deflection due to aerodynamic load. All axial-force measurements obtained on the main balance were corrected to a condition of free stream static pressure acting on the base of the model. All tests were made with boundary-layer transition fixed on the model by means of a narrow strip of carborundum grit placed on the body, wings and canards, using the methods outlined in reference 14.

The wing-root bending-gage technique used in this paper to obtain wing buffet information is described in reference 15.

RESULTS AND DISCUSSION

The flap deflections that were employed in this study were chosen so that the data obtained in this investigation would be compatible with the data

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presented in reference 12. As reference 12 points out these flap deflections do not necessarily represent an optimum.

The use of the canard balance and main balance made it possible to separate the wing lift $(C_{L,DIF})$ from the total lift (C_L) of the configuration. Since the total lift of each configuration was a strong function of the lift on the forebody (shaded area of figure 1), the buffet gage data $(C_{M,WSG})$ is presented versus wing lift coefficient $(C_{L,DIF})$. Presenting the data in this manner permits the study of the effect of canard location on wing buffet onset in terms of wing lift only. Of course the total lift coefficient of the configuration, at which buffet onset occurs is a very important consideration, and thus, the buffet gage data is also presented versus total lift coefficient.

Table II defines the configuration code that is used for the tabulated results presented in Table III. The data in figures 2 to 16 show the effect of canard height and wing leading edge flap deflection on the longitudinal aerodynamic characteristics and wing buffet characteristics for Mach numbers from 0.70 to 1.20.

The aerodynamic parameters presented in these figures are some of those which are usually utilized to predict buffet onset (reference 15). Among these parameters is a presentation of axial force coefficient (C_A) versus $\sin^2 \alpha$. Reference 16 points out that for subsonic attached potential flow, the axial force coefficient should vary linearly with $\sin^2 \alpha$. The implication from this and reference 15 is that buffet onset should occur when C_A is no longer a linear function of $\sin^2 \alpha$. It should be noted that the axial force coefficients are obtained from the main balance and thus include the contribution of the fuselage and canard as well as the wing. However, the canards have a symmetrical airfoil section, are geometrically smaller than the wings and have sharp

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leading edges; thus, the canard production of axial force should be small compared to that of the wing. In addition, since leading edge suction is a function of potential lift and since the fuselage doesn't produce significant levels of lift (reference $\frac{1}{4}$), it is assumed that the fuselage would not contribute significant amounts of thrust as compared to that of the wing. Therefore, the trends of the C_A curves are primarily influenced by the leading edge thrust of the wing.

When examining the buffet gage data $(C_{M,WSG})$, buffet onset is assumed to occur when the value of $C_{M,WSG}$ increases above a previous relatively constant level. It should be noted, however, that for the Mach number 0.70 data for all configurations, the value of $C_{M,WSG}$ changes with angle of attack throughout the complete angle-of-attack range. This may be due to inadequate stiffness in the model support system, canard buffet exciting fuselage bending or some other cause. This inadequate stiffness may also be a dominant factor causing a fairly significant level of output from the buffet gage even at low angles of attack at other Mach numbers. It is felt, therefore, that the $C_{M,WSG}$ data at a Mach number of 0.70 for all configurations should only be used in a qualitative manner.

The discussion presented herein will be limited to the buffet character. istics since the longitudinal aerodynamic characteristics for models of these configurations are rather fully documented in references 1-6.

Effect of Canard Height

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Figures 2 through 6 present longitudinal aerodynamic and wing buffet characteristics for the high canard (z/c = 0.185), low canard (z/c = -0.185)

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and canard off configurations for Mach numbers from 0.70 to 1.20.

Shown below are the approximate wing lift coefficients $(C_{L,DIF})$ and total configuration lift coefficient (C_L) at which buffet onset appears to occur as determined from the wing buffet gage data, $C_{M,WSG}$ (figures 2-6).

Lift Coefficients At Buffet Onset

	High Ce	undard	Low Ca	nard	Canard	Off
М	C _{L,DIF}	с ^г	CL,DIF	CL	C _{L,DIF}	CL
1.20 1.03 0.95 3.90 0.70	0.74 0.67 0.37 0.34 	1.03 0.93 0.55 0.52 	0.39 0.34 0.36 	0.61 0.51 0.52 	0.80 0.77 0.31 0.28	0.84 0.80 0.32 0.29

Leading-Edge Flaps Undeflected

The supersonic data (M = 1.20 and 1.03) in the above table shows that the wing lift $(C_{L,DIF})$ at which buffet onset appears to occur is significantly higher for the high canard and canard off configurations than the low canard configuration. At the Mach numbers 0.95 and 0.90 (figures 4 and 5) buffet onset occurs at slightly higher values of wing lift for the canard high and low than for the canard off configuration. For those configurations and Mach numbers where the lift coefficient at which buffet onset occurred could not be determined with some confidence no data are presented in the above table. The high canard configuration produces significantly higher total lift coefficients (C_L) at buffet onset than the other configurations. Since canard buffet onset could be a limiting factor to the total lift,

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some caution should be exercised in directly using the total lift coefficients (C_L) at which buffet onset occurs. As can be seen from the data in figures 2-5 the wing buffet intensity for the high canard configuration is significantly lower than that of the other configurations. In addition, generally the wing buffet intensity for the high canard configuration increases at a lower rate after buffet onset occurs than that of the other configurations. Since there is apparently a leading edge vortex on the wing in the presence of the high canard (references 4, 5 and 6), a gradual increase of wing buffet intensity after buffet onset occurs should be anticipated (see reference 12).

Effect of Wing Leading-Edge Flap Deflection - Canard Off

The data in figures 7-11 present the effect of wing leading edge flap deflection on wing buffet onset. Shown below in Table II are the approximate wing lift coefficients ($C_{L,DIF}$) and total configuration lift coefficients (C_{L}) at which buffet onset appears to occur as determined from the wing buffet gage data, $C_{M,WSG}$ (Figures 7-11)

	Flaps	Undeflected	Flaps De	flected
Μ	C _{L,DIF}	C _L	C _{L,DIF}	с _г
1.20 1.03 0.95 0.90 0.70	0.80 0.77 0.31 0.28	0.84 0.80 0.32 \$0.29	Greater than 1.0 Greater than 1.1 0.90 0.59	Greater than 1.1 Greater than 1.2 0.94 0.62
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Lift Coefficient At Buffet Onset

As is indicated in the above table, there is no indication of buffet onset for the configuration with the leading edge flaps deflected at Mach numbers of 1.20 and 1.03 in the angle of attack range tested. There are significant gains in the lift coefficient at which buffet onset occurs for the flaps deflected configuration over the flaps undeflected configuration at Mach numbers of 1.20, 1.03, 0.95 and 0.90. Comparing the buffet onset data for the high canard, flaps undeflected, configuration with that for the canard off, flaps deflected configuration (data in figures 2-5 with that in figures 7-10), it is acced that deflection of the leading edge flaps, capard off, allows higher attainable lift coefficients without buffet onset than was indicated by adding the high canard to the wing with leading edge flaps undeflected. This is not surprising since the close-coupled canard configuration creates a favorable flow field which allows the formation of wing leading edge vortices and the leading edge flaps function to maintain attached flow. Leading edge vortices have been shown previously to result in an early indication of buffet onset which after onset occurs does not increase in intensity as rapidly as the coafiguration with the leading edge flaps deflected. And in fact, the buffet intensity increases much faster after buffet onset occurs for the flaps deflected, canard off, configuration than for the high canard, flaps undeflected configuration.

It is interesting to note that for the Mach numbers of 0.95, 0.90 and 0.70 there are regions where C_A is a linear function of $\sin^2 \alpha$ for the flaps deflected configuration (fig. 9c-llc). As mentioned earlier this linear region is that region over which buffet free operation might be anticipated. Lower surface separation on the leading edge flap is the probable cause for the apparent lose of leading edge suction at the lower angles of attack (The angle of attack at

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which C_A ceases to be linear with $\sin^2 \alpha$ is the point at which the wing is assumed to start losing leading edge suction). The apparent buffet free regions as indicated by the axial force data in figures 7c-llc are presented, for the configuration with leading edge flap deflected, in the table below. By comparing

Regions of Buffet Free Operation As Determined

Μ	Leading H	Edge Flaps Deflected
5 	C _{L,DIF}	с ^г
1.20 1.03 0.95 0.90 0.70	$0.20 \neq 0.77 \\ 0.20 \neq 0.73 \\ 0.31 \neq 0.65$	 0.21 → 0.81 0.21 → 0.76 0.32 → 0.69

By	Axial	Force	Data
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the lift coefficients at which buffet onset occurs for the flaps deflected configuration as determined by the wing buffet gage data and axial force data, it is seen that the axial force data predicts a smaller buffet free region than the wing buffet gage data. (The wing buffet gage data, figures 9c and 10c, for Mach numbers of 0.95 and 0.90 indicate a lower lift coefficient limit of less than 0.0 for the buffet free region for the flaps deflected configuration.)

Effect Of Wing Leading-Edge Flap Deflection - Canard On

The data in figures 12-16 present the effect of wing leading edge flap deflection on wing buffet onset for the configuration with the high canard on. For the Mach number of 1.20 (figure 12) there is no indication of buffet onset

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from the buffet gage data for the flaps deflected configuration. For a Mach number of 1.03 (figure 13) the buffet gage indicates buffet onset occuring at approximately the same lift for both configurations (high canard; flap deflected and flap undeflected).

The buffet gage data as well as the axial force versus $\sin^2 \alpha$ data show no region of buffet free operation for Mach numbers of 0.95 and 0.90 (figures 14 and 15) for the leading edge flaps deflected configuration. Both $C_{M,WSG}$ and C_A data seem to indicate mild buffet over a rather large lift range for the flaps deflected case. The mild buffet is indicated by a slow rate of change of buffet intensity ($C_{M,WSG}$ data) and a slightly nonlinear region for the C_A versus $\sin^2 \alpha$ data. The buffet gage data shows a sharp increase in buffet intensity for the flaps deflected configuration at wing lift coefficients approximately the same as those for the off-wing leading edge flaps deflected configuration for Mach numbers of 0.95 and 0.90. (Compare the data in figures β and 10 with that in figures 14 and 15) Thus adding the canard to the flaps deflected wing did not substantially alter the wing lift coefficient at which there is strong indication of buffet onset.

CONCLUDING REMARKS

A generalized wind-tunnel model, with canard and wing planform typical of highly maneuverable aircraft, was tested in the Langley 8-foot transonic pressure tunnel at Mach numbers from 0.70 to 1.20 to determine the effects of canard location and wing leading edge flap deflection on the wing buffet characteristics. The major results of this investigations may be summarized as follows:

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1. The addition of a canard above the wing chord plane, for the configuration with leading edge flaps undeflected, allowed this configuration to obtain substantially higher total configuration lift coefficients before buffet onset occurs than the configuration with the canard off and leading edge flaps undeflected. However, the addition of the canard did not substantially affect the lift of the wing at which buffet onset occurs, for the configurations with the leading edge flaps undeflected, but the wing buffet intensity was substantially lower for the canard wing configuration than the wing alone configuration.

2. The low canard configuration generally displayed the poorest buffet the characteristics.

3. Deflecting the wing leading edge flaps substantially improved the wing buffet characteristics for canard off configurations.

4. The addition of the high canard did not appear to substantially improve the wing buffet characteristics of the wing with leading edge flaps deflected.

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GEOMETRIC CHARACTERISTICS OF MODEL

Body length, cm(in) 96.52(38.00) Wing Α 2.5 b/2, cm(in) 25.40(10.00) Leading edge sweep angle, deg. 44 č, em(in) 23.32(9.18) Airfoil Section NACA 64A Series S_{u} , cm(in) 1032.3(160.0) Root Chord, cm(in) 29.79 Tip Chord, cm(in) 6.78(2.67) Maximum thickness, percent chord at -6.0 Root 4.0 Tip Canard 17.25(6.79) b/2, cm(in) Leading edge sweep angle, deg 51.7 s_c , cm^2 (in²) 288.73(44.75) Circular arc Airfoil Section Root chord, cm (in) 17.92(7.05) 3.59(1.41) Tip chord, cm (in) Maximum thickness, percent chord at ż 6.0 Root 4.0 Tip 16

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TABLE I

TABLE II

TEST CONFIGURATIONS

Configuration Number	Canard	z/c	Wing flaps
1	On	0.185	deflected
2	Off	0.185	deflected
3	Off	0.185	undeflected
4	On	-0.185	undeflected
5	On	0.185	undeflected
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TEST DATA

Symbols used in the tabulated data are defined as follows.

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CONFIG.	configuration number (see table II)
MACH NO	Mach number
ç Q	free-stream dynamic pressure, 1b/ft ²
	$(1 \ 1b/ft^2 = 97.88 \ N/m^2)$
BETA	angle of sideslip, deg
ALPHA	angle of attack, deg
CN	normal-force coefficient
CA	axial-force coefficient
CM	pitching-moment coefficient
R/FT	Reynolds number per foot x10 ⁻⁶
TEMP	air temp in wind tunnel, ^O F
CMWSG	wing mean bending moment coefficient
CL	lift coefficient
CD	drag coefficient
L/D	lift-drag ratio

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		LETA	0.00	0.00	00.00	0.00	0.00	0.00	0.00	00.00	00-00	0.03	0.00	00-00	0.00	0.00)))			BETA	00.00	00*0	00-00	0.00	00•0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
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0 2.15 .1374 .01147 0257 2.98 119.9 .00307 .1136 533.71 0.000 4.44 .4398 .00575 0954 2.98 120.4 .00376 .285 533.71 0.000 16.44 .4398 .00575 0954 2.98 120.4 .00376 .285 533.15 0.000 18.43 .95613 .00790 1114 2.98 120.4 .00455 .554 533.15 0.000 12.64 .644 .01168 2102 2.98 120.4 .00457 .613 533.260 0.000 14.80 .9444 .01188 2102 2.98 120.4 .00457 .613 533.291 0.000 19.14 2102 2.98 120.4 .00457 .613 533.291 0.000 18.83 .9574 .01364 2102 2.98 .00561 .984 .911 533.213 0.00 19.14 .2023 .01345 .298 120.4 .00457 .018 533.43 0.00	N 0.00 2.15 1.1374 0.0147 0057 2.98 119.9 .00307 2.13 533.17 0.000 0.44 .4398 00575 0057 2.98 119.9 .00307 .2137 533.17 0.000 0.44 .4398 00575 0057 2.98 120.4 .00496 .553 533.16 0.000 14.40 .8451 .00101 1.114 2.98 120.4 .00496 .553 533.10 0.000 14.40 .8451 .01103 1124 2.98 120.4 .00496 .553 533.10 0.000 14.40 .8451 .0103 .1134 .2003 .2014 .00496 .553 533.10 0.000 14.10 .700 .2134 .0003 .2015 .00316 .2014 .00446 .00336 .2014 533.10 0.000 18.11 .0003 .2184 .2004 .2014 .2004 .2014 .2004 <th< td=""><td>X <thx< th=""> <thx< th=""> <thx< th=""></thx<></thx<></thx<></td><td>N S321.18 0.000 Z.13 1.117.4 2.98 119.7 0.0037 2.117.4 0.037 2.117.4 0.037 2.117.4 0.037 2.117.4 0.037 2.117.4 0.037 2.117.4 0.037 2.117.4 0.037 2.117.4 0.037 2.117.4 0.037 2.117.4 0.037 2.117.4 0.037 2.117.4 0.037 2.103 0.037 2.103 0.037 2.117.4 0.037 2.111.4 0.037 2.117.4 0.037 2.117.4 0.037 2.117.4 0.037 2.117.4 0.037 2.111.4 0.037 2.111.4 0.037 2.111.4 0.037 1.11</td><td>X <thx< th=""> <thx< th=""> <thx< th=""></thx<></thx<></thx<></td><td></td><td>533.75</td><td>00.00</td><td>- 00</td><td>0032</td><td>•01344</td><td>.0010</td><td>2.99</td><td>119.5</td><td>.00289</td><td>- 003</td><td>2</td><td>2 .01344</td></th<>	X X <thx< th=""> <thx< th=""> <thx< th=""></thx<></thx<></thx<>	N S321.18 0.000 Z.13 1.117.4 2.98 119.7 0.0037 2.117.4 0.037 2.117.4 0.037 2.117.4 0.037 2.117.4 0.037 2.117.4 0.037 2.117.4 0.037 2.117.4 0.037 2.117.4 0.037 2.117.4 0.037 2.117.4 0.037 2.117.4 0.037 2.117.4 0.037 2.103 0.037 2.103 0.037 2.117.4 0.037 2.111.4 0.037 2.117.4 0.037 2.117.4 0.037 2.117.4 0.037 2.117.4 0.037 2.111.4 0.037 2.111.4 0.037 2.111.4 0.037 1.11	X X <thx< th=""> <thx< th=""> <thx< th=""></thx<></thx<></thx<>		533.75	00.00	- 00	0032	•01344	.0010	2.99	119.5	.00289	- 003	2	2 .01344
533.71 0.00 6.44 .4398 00057 0003 2.998 120.4 000306 .4554 533.130 0.00 10.61 .6661 00790 11574 2.988 120.4 000356 .5554 533.130 0.00 12.69 .7525 .01090 1874 2.98 120.4 .00556 .5554 533.150 0.00 16.63 .5575 .010153 2102 2.98 120.4 .00561 .981 533.17 0.00 16.63 .5575 .010153 2102 2.98 120.4 .00561 .981 533.17 0.00 16.63 .9576 .01153 2102 2.98 120.5 .00561 .981 533.17 0.00 19.77 .9530 .011359 2102 .21025 .00561 .981 533.17 0.00 19.77 .91343 .00053 2.98 120.4 .00561 .981 533.17 0.00 19.1399 21023 .011343 .2065 2.98 120.4 .00564 .00254	N Size 1 0.00 0.44 1.796 0.0075 1.00	No. Output Constraint Constrat <thconstraint< th=""> <thco< td=""><td>No. Size is an analysis and and an analysis and an analysis and and an analysis and and analysis and analysis and analysis and analysis and analysis and and analysis and and analysis and and and and and and and and and and</td><td>N Signify 0.000 6.44 4.53 6.0007 6.44 4.53 6.0007 6.44 4.53 6.0007 6.44 4.53 6.0007 6.44 4.53 6.0048 4.1014 6.0058 4.0014 4.1014 6.0058 4.0014<td>I</td><td>533.16</td><td>0.00</td><td>2.15</td><td>•1374 2010</td><td>.01147</td><td>0257</td><td>2.98</td><td>119.9</td><td>.00307</td><td>•136</td><td>σ,</td><td>9 .01661</td></td></thco<></thconstraint<>	No. Size is an analysis and and an analysis and an analysis and and an analysis and and analysis and analysis and analysis and analysis and analysis and and analysis and and analysis and	N Signify 0.000 6.44 4.53 6.0007 6.44 4.53 6.0007 6.44 4.53 6.0007 6.44 4.53 6.0007 6.44 4.53 6.0048 4.1014 6.0058 4.0014 4.1014 6.0058 4.0014 <td>I</td> <td>533.16</td> <td>0.00</td> <td>2.15</td> <td>•1374 2010</td> <td>.01147</td> <td>0257</td> <td>2.98</td> <td>119.9</td> <td>.00307</td> <td>•136</td> <td>σ,</td> <td>9 .01661</td>	I	533.16	0.00	2.15	•1374 2010	.01147	0257	2.98	119.9	.00307	•136	σ,	9 .01661
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533.30 0.000 12.61 .6661 .00790 1576 2.98 120.4 .00449 .731 533.15 0.000 12.69 .7525 .01001 2102 2.98 120.4 .00457 .814 533.21 0.000 16.83 .9276 .01153 2382 2.98 120.4 .00457 .814 533.21 0.000 18.83 .9554 .011304 2553 2.98 120.5 .000560 .909 533.17 0.000 18.83 .9554 .011304 2553 2.98 120.5 .00560 .910 533.17 0.000 10.153 2553 .01343 .0003 2.98 120.5 .00560 .910 533.17 0.000 10.134 2553 .001369 .2003 .91349 .012 533.17 0.000 0134 1343 .0003 2.98 120.6 .912 .912 533.117 0.000 01343 .01344 .712 .118.9 .90344 .244 533.119 0.000	533.150 0.000 10.041 .0651 .00190 1576 2.98 120.4 .00496 .731 533.164 0.000 16.43 .2765 .01194 .22102 2.998 120.4 .00461 .884 533.164 0.000 16.43 .2765 .01194 .2589 2.998 120.5 .00561 .884 .91194 .284 .91194 .911 533.164 0.000 19.179 .9400 .01194 .2582 2.998 120.5 .00561 .984 .911 533.147 0.000 19.179 .9400 .01194 .2102 .00194 .1844 533.147 0.000 19.179 .0013 .01343 .00034 .2015 .00368 .911 533.47 0.000 19.179 .01343 .2003 .0144 .0044 .00368 .911 533.47 0.000 19.179 .0003 .01343 .2014 .0044 .0034 .1010 6 0.00 -1014 .0104 .0104 .0123 .0114 .0014	333.15 0.000 12.64 .00646 .00346 .00346 .00346 333.15 0.000 12.64 .00641 .00344 .0134 .248 120.4 .00646 .1314 333.15 0.000 12.64 .00446 .3444 .01084 2102 2.98 120.4 .006461 .1844 333.16 0.000 12.64 .00446 .3444 .01154 2102 2.98 120.4 .006461 .8844 .0015 333.11 0.000 12.73 .9900 .01154 2562 2.98 120.5 .00566 .9917 333.11 0.000 19.77 .9900 .01154 2562 2.98 120.5 .00566 .0056 .9917 533.41 0.000 19.77 .9900 .01154 .7012 .2016 .002568 .0026 .00266 .00266 .00266 .00266 .00266 .244 .00266 .00266 .00266 .00266 .00266 .00266 .00266 .00266 .00266 .00266 .00266 .00266 .244	533.15 0.000 12.04 .00049 -1.576 2.98 120.4 .00049 .7513 533.15 0.000 14.40 .8444 .01088 2102 2.98 120.4 .00047 .8144 .00047 .8144 .00047 .8133 .5554 .01004 1516 2.98 120.4 .00047 .8133 .5554 .01104 2102 2.98 120.4 .000591 .9134 .000561 .9914 .9114 .00047 .9114 .000561 .9914 .9114 .000561 .9914 .9114 .9114 .00139 001	333.10 0.000 12.41 .0661 .0069 .1576 2.98 120.4 .00649 .7513 332.0% 0.000 14.40 .8444 .01088 2102 2.98 120.4 .00649 .9133 332.0% 0.000 14.40 .8444 .01088 2102 2.98 120.4 .00649 .9134 332.0% 0.000 18.83 .0555 .01304 2598 2.98 120.4 .00649 .9134 332.117 0.000 19.17 .0003 .01149 2598 2.98 120.5 .000560 .9914 533.117 0.000 19.11 .0003 .01149 2558 2.99 120.5 .005560 .003564 .00156 533.117 0.000 19.11 .0003 .01149 2552 2.99 120.6 .003564 .00556 .003564 .003564 .00156 .003564 .00156 .003564 .00156 .003564 .00156 .003564 .00156 .003564 .01166 .01166 .00156 .001566 .001566 <t< td=""><td></td><td>533.36</td><td>0.00</td><td>8.53</td><td>.5613</td><td>.00675</td><td>1314</td><td>2.98</td><td>120.4</td><td>.00456</td><td>.554</td><td></td><td>1 .08996</td></t<>		533.36	0.00	8.53	.5613	.00675	1314	2.98	120.4	.00456	.554		1 .08996
533.09 0.000 17.069 -7.255 0.0061 -1.824 2.98 120.4 00457 .814 533.04 0.000 16.83 -9576 011369 -22102 2.998 120.4 000457 .814 533.47 0.000 16.83 -9554 01304 2589 2.998 120.5 00560 -909 533.47 0.000 19.79 -9800 01343 -001153 2102 2.998 120.5 -00560 -909 533.47 0.000 -0.01 -0.0143 -72023 -01343 -00019 2.998 120.5 -00560 -909 533.47 0.000 -0.01 0023 -01343 -00019 2.998 120.6 -003308 002 533.47 0.000 013 0023 01349 710 2002 .00308 903 0034 9012 6 0.000 1210 1222 .01349 .700 CONFIG. .00346 1211 7 0.000 2100 .01222 .01049 01	No. 1732 0.000 12.05 0.00644 1731 S32.01 0.000 16.83 5276 01001 -1822 2.98 120.4 000641 .814 S32.01 0.000 16.83 5276 01139 2382 2.98 120.4 000641 .814 S33.01 0.000 16.83 5276 01139 2552 2.98 120.4 000641 .814 S33.01 0.000 19.19 .9654 01139 2552 2.98 120.6 .00364 -0013 S33.01 0.000 1.0139 2552 .0139 2652 2.98 120.6 .00364 -0012 S33.01 0.000 1.0139 .271 0.001 2.99 120.6 .00364 -002 MACH NG .700 .701 .702 .701 .702 .701 MACH NG .700 .700 .700 .701 .700 .701 S24.0 0.0001	532.00 0.000 17.00 -7.00 17.00 -000645 -00054 -000645 -00054 -00054 -00054 -00054 -00054 -00054 -00054 -00054 -00024 -00054 -00024 -00054 -00024 -00054 -00054 -00054 -00054 -00054 -00054 -00054 -00054 -00024 -00054 -00024 -00024 -00024 -00024 -000446 -11211 -00124 -00124 -00124 -00124 -00124 -00124 -00124 -00124 -00124 -00124 -00124 -00124 -00124 -00124 -00124 -00124 -00124	323.10 0.000 12.40 -775 0.000 12.45 .00443 .771 533.10 0.000 16.43 -2776 0.01153 2182 2.98 120.4 .00443 .771 533.10 0.000 16.43 -2776 0.1153 2182 2.98 120.4 .00461 .844 533.47 0.000 18.73 -0001 18.73 .9003 120.5 .00051 .844 533.47 0.000 18.71 -0001 1.71 .0003 .00134 .000318 .11010 .001318 .001318 .001318 .001318 .001318 .001318 .001318 .001318 .001318 .001318 .001318 .001318 .001318 .001318 .001318 <	733:10 0.000 17.00 -7.12 2.004 120.4 00444 -771 533:01 0.000 16.43 -8776 01139 -7.242 2.091 120.4 000461 -60461 533:01 0.000 16.43 -8776 01139 -2692 2.991 120.5 000561 -60461 -60461 533:01 0.000 16.43 -8776 01139 -2662 2.991 120.5 000561 -60561 -60461 -7044 -60461 -60461 -7044 -60461 -7041 -7044 -60461 -7044 -60461 -7044 -60461 -7044 -7044 -60461 -7044 -7044 -7044 -7044 -7044 -7044 -7044 -7044 -7044 7		533.30	00-00	10.61	. 6661	.00790	1576	2.98	120.4	.00496	.653	e	3 .13040
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533.43 0.000 19.19 -5622 2.98 120.5 .00584 .917 513.17 0.000 01 6023 .01343 .00009 2.98 120.6 .00308 0023 MACH NO 01 6023 .01343 .00009 2.948 120.6 .00308 0023 MACH NO 01 6023 .01343 .00009 2.948 120.6 .00308 0023 MACH NO .700 .700 .700 .700 .700 .70034 1214 MACH NO .700 .700 .700 .700 .700344 2444 MACH NO .700 .700 .700 .700 .72444 MACH NO .700 .700 .700344 1214 1214 MACH NO .700 .70034 1214 2444 2444 MACH NO .0012 3.52 119.0 .00346 1214 MACH NO .01099 .01099 01099 01995 3.52 2419 S254.460 000	533.43 0.000 19.79 .5300 .01343 .0003 2.98 120.5 .00584 .9173 533.17 0.000 01 0013 .01343 .0003 2.98 120.5 .00584 .9173 F 533.17 0.00 01 0023 .01343 .0003 2.98 120.5 .00368 9173 F AACH ND .700 .01343 .00134 .01343 .0023 2.99 120.6 .00034 .9173 F AACH ND .700 .01343 .01343 .01343 .0023 .00236 .00234 .9173 F AACH ND .700 .7003 .01349 .00123 .952 118.9 .00134 7213 F 524.98 0.000 1222 .01049 .01233 .522 118.9 .00344 7213 F 524.98 0.000 2.110 1222 .01049 01343 2419 .00134 F 524.94 0.000 2.120 11293 02023 2419 001	533.43 0.000 19.79 -5930 -011343 -2652 2.98 120.6 -00018 -9113 533.17 0.000 011 0023 .01343 .0005 2.99 120.6 .00028 0023 1 0023 .01343 .0005 2.99 120.6 .00028 0023 1 0023 .01343 .001343 0013 2.99 120.6 .0023 1 0021 .01343 .0013 .01343 0005 2.99 120.6 .00028 1 0021 .01343 .01343 001 1134 0023 0024 11217 1 0.00 110 1222 .01099 0123 3.52 119.9 00344 1121 524.498 0.000 2.1145 .01199 00123 3.52 119.9 00344 11160 524.498 0.000 5.1145 0013 3.52 119.9 00344 00344 524.458 0.000 5.24.113 0.0004 11139 3.52	533.43 0.000 19.79 -5600 -0115 0033 2.96 120.5 .00306 0012 F 533.17 0.000 011 0023 .01343 .0005 2.96 120.6 .00306 0023 F 9 0 6 F MACH NG .700 CONFIG. 3 F 9 0 6010 -4.194 CN CA K/FT TEMP CMMSG CA F 9 0 0 -4.194 CN CA 119.9 00394 -7.211 F 524.98 0.000 -1.100 -1.1222 .01094 .0123 3.52 119.9 003344 -7.211 F 525.29 0.000 -1.122 .01094 .01299 .00244 .1121 F 525.21 0.000 4.210 -10199 .00248 .100344 .1121 F 525.21 0.000 4.211 .01299 .01299 .00248 .1121 F 525.11 0.000 1.120 .01293	533.473 0.000 19.17 5013 01343 0003 2.496 120.6 00306 0102 513.17 0.000 011 0023 .01343 0003 2.496 120.6 00306 0023 1 0 011 0023 .01343 0003 2.496 120.6 00306 0023 1 0 011 1023 .01343 0014 .700 CONFIG. 3 0123 00334 1211 2 2 0.000 -2.10 1222 01233 252 119.4 00334 1211 2 2 0.000 -2.10 1222 01233 252 119.4 00334 1211 2 2 0.000 2.122 01233 252 119.4 00334 1212 2 2 0.000 2.122 01233 252 119.4 00334 1211 2 2 0.000 2.123 01239 01233 1211 00346	÷	532.91	00.0	16.63	.9654	.01304	2589	2.98	120.5	.00560	560 6		.32395
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525.29 0.00 2.12 .1165 .010990195 3.52 119.0 .00248 .1160 524.60 0.00 4.26 .2430 .005760432 3.52 119.0 .00294 .2419 524.98 0.00 6.41 .3807 .000700704 3.52 119.0 .00338 .3783	525.29 0.00 2.12 .1165 .01099 0195 3.52 119.0 .00244 .1160 524.460 0.00 4.26 .2430 .00576 0432 3.52 119.0 .00294 .2419 524.494 0.00 6.41 .3801 .00070 0704 3.52 119.0 .00338 .3783 524.450 0.00 8.52 .5071 000190 10704 3.52 119.0 .00338 .3783 524.51 0.00 18.52 .5011 000190 11239 3.52 119.0 .00338 .5017 524.51 0.00 12.72 .7062 .00055 1612 3.52 118.9 .00480 .6687 524.51 0.00 12.72 .7062 .00055 1612 3.52 118.9 .00569 .6887 524.51 0.00 16.86 .8607 .00722 1612 3.52 118.9 .005645 .7656 524.51 0.00 17.89 .6844 .00722 .16123 3.52 118.9	525.29 0.00 2.12 .1165 .01099 01195 3.52 119.0 .00248 .1160 524.60 0.00 4.26 .2430 .00576 0432 3.52 119.0 .00294 .2419 524.94 0.00 6.41 .3807 .00070 07132 3.52 119.0 .00294 .2419 524.94 0.00 6.41 .3807 .00070 0132 3.52 119.0 .00248 .5017 524.50 0.00 18.52 .5011 00119 1139 3.52 118.9 .00569 .6887 524.51 0.00 12.72 .70050 11329 3.52 118.9 .00569 .6887 525.11 0.00 12.72 .70050 11329 3.52 118.9 .00569 .6887 525.12 0.00 16.86 .8607 .00722 11312 3.52 118.9 .005645 .7656 524.51 0.00 17.89 .6844 .00722 11312 3.52 118.9 .005645 .7656	525.29 0.000 2.12 .1165 .01099 01195 3.52 119.0 .00244 .2119 524.460 0.000 6.41 .3807 00432 3.52 119.0 .00294 .2119 524.94 0.000 6.41 .3807 00432 3.52 119.0 .00338 .3783 524.94 0.000 10.63 .c130 01199 1139 3.52 119.9 .00481 .5017 524.92 0.000 10.63 .c130 01129 3.52 118.9 .00481 .5017 524.52 0.000 12.72 .70652 .00193 3.52 118.9 .00481 .5017 524.51 0.000 12.72 .70050 01222 1612 3.52 118.9 .00469 .6027 525.13 0.000 17.89 .6867 .00782 1612 3.52 118.9 .00469 .6027 524.51 0.000 17.89 .6867 .00722 1612 3.52 119.0 .00569 .68876 524.51 </td <td>525.29 0.000 2.12 1165 .01099 0195 3.52 119.0 .00248 .1165 5244.60 0.000 4.26 .2430 .00676 0432 3.52 119.0 .00294 .2419 5244.50 0.00 4.26 .2430 .000576 0432 3.52 119.0 .00294 .2419 5244.51 0.00 8.52 .5071 00040 0643 3.52 119.0 .00338 .3783 5244.52 0.00 10.63 .6130 0119 11139 3.52 118.9 .00481 .5017 5244.51 0.00 10.63 .6130 01139 3.52 118.9 .00486 .6027 5244.60 0.00 12.72 .77062 .000505 1139 3.52 118.9 .00663 .8816 5255.13 0.00 16.86 .00632 1612 3.52 118.9 .00663 .8816 5255.10 0.00 11.89 .6867 .00722 1613 3.52 119.0 .0044 5</td> <td>-</td> <td>525.07</td> <td>00</td> <td>10.</td> <td>0036</td> <td>.01295</td> <td>.0012</td> <td>3.52</td> <td>119.0</td> <td>.00278</td> <td>- • 0036</td> <td></td> <td>.01295</td>	525.29 0.000 2.12 1165 .01099 0195 3.52 119.0 .00248 .1165 5244.60 0.000 4.26 .2430 .00676 0432 3.52 119.0 .00294 .2419 5244.50 0.00 4.26 .2430 .000576 0432 3.52 119.0 .00294 .2419 5244.51 0.00 8.52 .5071 00040 0643 3.52 119.0 .00338 .3783 5244.52 0.00 10.63 .6130 0119 11139 3.52 118.9 .00481 .5017 5244.51 0.00 10.63 .6130 01139 3.52 118.9 .00486 .6027 5244.60 0.00 12.72 .77062 .000505 1139 3.52 118.9 .00663 .8816 5255.13 0.00 16.86 .00632 1612 3.52 118.9 .00663 .8816 5255.10 0.00 11.89 .6867 .00722 1613 3.52 119.0 .0044 5	-	525.07	00	10.	0036	.01295	.0012	3.52	119.0	.00278	- • 0036		.01295
524.94 0.00 6.41 .3807 .000700704 3.52 119.0 .00338 .3783	524.94 0.00 6.41 3871 0.0070 5.24 352 119.0 0.0338 3783 525.51 0.00 6.41 3871 -00704 3.52 119.0 00338 3783 524.50 0.00 8.52 .5071 -007040 0704 3.52 119.0 .00338 .3783 524.51 0.00 10.63 .6130 01139 3.52 119.0 .00338 .3783 524.60 0.00 10.63 .6130 01139 3.52 118.9 .00486 .6027 524.51 0.00 12.72 .7062 .00055 1329 3.52 118.9 .00569 .6887 525.51 0.00 14.81 .7933 .00522 1612 3.52 118.9 .005645 .7656 524.51 0.00 16.86 .8607 .00722 1813 3.52 118.9 .005645 .7656 525.11 0.00 17.89 .6844 .00722 1813 3.52 118.9 .005645 .7656 524.51<	524.94 0.00 6.41 3801 0.0010 0436 3.52 119.0 0.00338 .3783 525.17 0.00 6.41 3801 -00010 0463 3.52 119.0 0.00338 .3783 524.94 0.00 6.41 3801 -00010 01063 3.52 119.0 0.00338 .3783 524.51 0.00 12.72 .70030 1139 3.52 119.0 0.0480 .6027 524.51 0.00 12.72 .70050 1139 3.52 118.9 .00486 .6027 524.51 0.00 14.81 .7933 .00525 1812 3.52 118.9 .00569 .6887 525.51 0.00 14.81 .7933 .00525 1813 3.52 118.9 .00569 .6887 524.51 0.00 17.89 .6844 .00880 1921 3.52 118.9 .00565 .6389 525.5.06 0.00 17.89 .6844 .00272 .1813 .00565 .63816 5255.06	524.90 0.00 6.41 3801 0.0010 0122 3.52 119.0 0.00318 .3783 525.51 0.00 6.41 3801 00100 0164 3.52 119.0 0.00318 .3783 524.50 0.00 6.41 3801 00100 0164 3.52 119.0 0.00318 .3783 524.51 0.00 10.63 .6130 00119 1139 3.52 119.0 0.0486 .6027 524.51 0.00 12.72 .7062 00119 11329 3.52 118.9 .00569 .6887 525.13 0.00 12.72 .7062 00127 11329 3.52 118.9 .00569 .6887 525.11 0.00 14.81 .7933 .00525 1612 3.52 118.9 .00569 .6887 525.11 0.00 16.86 .8607 .00722 1612 3.52 118.9 .00663 .8216 525.116 0.00 00044 .01299 .0013 3.52 119.0 .00272	524.90 0.000 6.41 336.7 0.000 6.41 336.7 0.003 57.83 524.94 0.000 8.52 5971 -00060 -0076 3.52 119.0 00033 5783 524.95 0.000 12.72 -7062 -00119 -11139 3.52 118.9 00486 -5027 524.450 0.000 12.72 -7062 -00119 -11139 3.52 118.9 -00486 -5027 524.51 0.000 12.72 -7062 -001293 -5021 118.9 -00486 -5027 524.51 0.000 12.72 -7062 -001293 -522 118.9 -00486 -5027 525.13 0.001 12.72 -7062 -001293 -11813 3.52 118.9 -00569 -6887 525.14 0.001 16.860 -00580 -1921 3.52 119.0 -00569 -6887 525.06 0.001 16.890 -00280 -1921 3.52 119.0 -00569 -6887 525.06 0.001		525.29	0.00	2.12	.1165	.01099	0195	3 . 52	119.0	.00248	.1160		.01528
	525.17 0.00 8.52 .5071 00080 0963 3.52 119.0 .00481 .5017 524.52 0.00 10.63 .6130 00119 1139 3.52 118.9 .00481 .5017 524.52 0.00 12.72 .7062 .00050 1329 3.52 118.9 .00486 .6027 524.60 0.00 12.72 .7062 .000525 1612 3.52 118.9 .00569 .6887 525.13 0.00 14.81 .7793 .00522 1612 3.52 118.9 .00569 .7656 525.21 0.00 16.86 .8607 .00772 1813 3.52 118.9 .00663 .8216 524.51 0.00 17.89 .6844 .00880 1921 3.52 119.0 .00675 .6339 525.5.06 0.00 0044 .01299 .0013 3.52 119.0 .00572 .0044	525.17 0.00 8.52 .5071 00080 0963 3.52 119.0 .00481 .5017 524.52 0.00 10.63 .c130 00119 1139 3.52 118.9 .00486 .6027 524.60 0.00 12.72 .7062 .00050 1329 3.52 118.9 .00569 .6887 524.60 0.00 12.72 .7062 .00050 1329 3.52 118.9 .00569 .6887 525.13 0.00 14.81 .7933 .00525 1612 3.52 118.9 .00569 .6887 525.21 0.00 14.81 .7933 .00525 1612 3.52 118.9 .005645 .7656 524.51 0.00 16.86 .00782 1813 3.52 119.0 .00663 .8389 525.06 0.00 0044 .01299 .0013 3.52 119.0 .00655 .6389	525.17 0.00 8.52 .5071 00080 0963 3.52 119.0 .00480 .5017 524.52 0.00 10.63 .6130 00119 1139 3.52 118.9 .00480 .6027 524.52 0.00 12.72 .7062 .00050 1329 3.52 118.9 .00569 .6887 524.60 0.00 12.72 .7062 .00555 1612 3.52 118.9 .00569 .6887 525.13 0.00 14.81 .7933 .00525 1612 3.52 118.9 .00569 .6887 525.21 0.00 14.81 .7933 .00525 1612 3.52 118.9 .00663 .8216 524.51 0.00 17.89 .6844 .00272 -1921 3.52 119.0 .00663 .8389 525.06 0.00 0044 .01299 .0013 3.52 119.0 .00663 .8389 525.06 0.00 0044 .01299 .0013 3.52 119.0 .00272 .0044 <td>525-37 0.00 8.52 .5071 00080 0963 3.52 119.0 .00481 .5017 524-52 0.00 10.63 .6130 01139 3.52 118.9 .00481 .5017 524-52 0.00 10.63 .6130 00119 1139 3.52 118.9 .00569 .6887 524-51 0.00 12.72 .7062 .000525 1612 3.52 118.9 .00569 .6887 525-21 0.00 14.81 .7793 .00525 1612 3.52 118.9 .00569 .6887 525-21 0.00 14.81 .7733 .00525 -11612 3.52 118.9 .00563 .8216 525-21 0.00 17.89 .8844 .00880 1921 3.52 119.0 .00663 .63389 525-106 0.00 -0.00 0044 .01299 .0013 3.52 119.0 .00577 0044 525-106 0.00 -0.0013 3.52 119.0 .00272 0044</td> <td>I</td> <td>524-94</td> <td>00.00</td> <td>4.60 6.41</td> <td>1086.</td> <td>01000</td> <td>- 0704</td> <td>3.52</td> <td>119-0</td> <td>-00338</td> <td>- 2419</td> <td></td> <td>91620-</td>	525-37 0.00 8.52 .5071 00080 0963 3.52 119.0 .00481 .5017 524-52 0.00 10.63 .6130 01139 3.52 118.9 .00481 .5017 524-52 0.00 10.63 .6130 00119 1139 3.52 118.9 .00569 .6887 524-51 0.00 12.72 .7062 .000525 1612 3.52 118.9 .00569 .6887 525-21 0.00 14.81 .7793 .00525 1612 3.52 118.9 .00569 .6887 525-21 0.00 14.81 .7733 .00525 -11612 3.52 118.9 .00563 .8216 525-21 0.00 17.89 .8844 .00880 1921 3.52 119.0 .00663 .63389 525-106 0.00 -0.00 0044 .01299 .0013 3.52 119.0 .00577 0044 525-106 0.00 -0.0013 3.52 119.0 .00272 0044	I	524-94	00.00	4.60 6.41	1086.	01000	- 0704	3.52	119-0	-00338	- 2419		91620-
	524.60 0.00 12.72 .7062 .00050 1329 3.52 118.9 .00569 .6887 525.13 0.00 14.81 .7933 .00525 1612 3.52 118.9 .00565 .7656 525.21 0.00 16.86 .8607 .00772 1611 3.52 118.9 .00563 .8216 525.21 0.00 15.86 .8607 .00772 1813 3.52 118.9 .00663 .8216 524.51 0.00 17.89 .6844 .00880 1921 3.52 119.0 .00675 .8389 525.06 0.00 00 0044 .01299 .0013 3.52 119.0 .00272 0044	524.60 0.00 12.72 .7062 .00050 1329 3.52 118.9 .00569 .6887 525.13 0.00 14.81 .7733 .00525 1612 3.52 118.9 .005645 .7656 525.21 0.00 14.81 .7733 .00722 1612 3.52 118.9 .005645 .7656 525.21 0.00 16.86 .8607 .00722 16113 3.52 118.9 .00663 .8319 524.51 0.00 17.89 .6844 .00880 1921 3.52 119.0 .006775 .63389 525.06 0.00 0044 .01299 .0013 3.52 119.0 .00272 0044	524.60 0.00 12.72 .7062 .00050 1329 3.52 118.9 .00569 .6887 525.13 0.00 14.81 .7933 .00525 1612 3.52 118.9 .00565 .7656 525.21 0.00 16.86 .8607 .00722 1612 3.52 118.9 .00565 .8349 525.4.51 0.00 17.89 .6844 .00880 1921 3.52 119.0 .00663 .8349 525.4.51 0.00 00 0044 .01299 .0013 3.52 119.0 .00272 0044	524.60 0.00 12.72 .7062 .00525 1329 3.52 118.9 .00545 .7656 525.13 0.00 14.81 .7793 .00525 1612 3.52 118.9 .00545 .7656 525.13 0.00 14.81 .7793 .00525 1612 3.52 118.9 .00545 .7656 525.4.51 0.00 16.86 .8607 .00772 1813 3.52 118.9 .005675 .8319 525.4.51 0.00 00 .0044 .01299 .0013 3.52 119.0 .00272 0044 525.5.06 0.00 0044 .01299 .0013 3.52 119.0 .00272 0044 7 525.06 0.00 0044 .01299 .0013 3.52 119.0 .00272 0044	K	524.52	0.00	10.63	. 6130	00119	1139	3.52	118.9	•00486	. 6027		16111.
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Figure 2.- Effect of canard position on the longitudinal aerodynamic characteristics and wing buffet for the model with the leading edge flaps undeflected at a Mach number of 1.20.

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Figure 2.- Continued.

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Figure 3.- Effect of canard position on the longitudinal aerodynamic characteristics and wing buffet for the model with the leading edge flaps undeflected at a Mach number of 1.03.

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Figure 3.- Continued.

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Figure 4.- Effect of canard position on the longitudinal aerodynamic characteristics and wing buffet for the model with the leading edge flaps undeflected at a Mach number of 0.95.

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Figure 5.- Effect of canard position on the longitudinal aerodynamic characteristics and wing buffet for the model with the leading edge flaps undeflected at a Mach number of 0.90.

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Figure 6.- Effect of canard position on the longitudinal aerodynamic characteristics and wing buffet for the model with the leading edge flaps undeflected at a Mach number of 0.70.

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Figure 8.- Effect of wing leading edge flap deflection on the longitudinal aerodynamic characteristics and wing buffet for canard off at a Mach number of 1.03.

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Figure 9.- Effect of wing leading edge flap deflection on the longitudinal aerodynamic characteristics and wing buffet for canard off at a Mach number of 0.95.

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Figure 11.- Effect of wing leading edge flap deflection on the longitudinal aerodynamic characteristics and wing buffet for canard off at a Mach number of 0.70.

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Figure 12.- Effect of wing leading edge flap deflection on the longitudinal aerodynamic characteristics and wing buffet for canard on at a Mach number of 1.20.

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Figure 14.- Effect of wing leading edge flap deflection on the longitudinal aerodynamic characteristics and wing buffet for canard on at a Mach number of 0.95.

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Figure 15.- Effect of wing leading edge flap deflection on the longitudinal aerodynamic characteristics and wing buffet for canard on at a Mach number of 0.90.

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Figure 16.- Effect of wing leading edge flap deflection on the longitudinal aerodynamic characteristics and wing buffet for canard on at a Mach number of 0.70.

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