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\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* C F D - F A S T R A N - S O L V E R \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

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Date : 08/22/2017 19:00:11

DTF File Name : Apollo\_CM\_18\_14.DTF

CFD-FASTRAN-GUI Version : V2014.0.0

CFD-FASTRAN-SOLVER Version : V2014.0.1.8 DTF V7.8.6 07/15/2014 14:09:26

Build platform : KELVIN pc-windows-nt6-x86\_64 CYGWIN\_NT-6.1-WOW64 1.7.18(0.263/5/3) i686

Working Simulation Number : 1

System Information

Machine Name: SLICK

OS Name :

OS Release :

OS Version :

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\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* I N P U T S U M M A R Y \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

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FASTRAN Model Description

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Model Name : Apollo\_CM\_18\_14

Problem Title : None

Geometry Scaling : 1.000

File Source : CFD-GEOM V2014.0.0.12

File DTF Version : 7.8.6

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Problem Specifications

-------------------------------------------------------------------------------

NZONES NCYCLES STEADY NSUBCYCLES AXI-SYM OVERSET

1 5000 0 1 T 0

-------------------------------------------------------------------------------

Function Definition / Timing

-------------------------------------------------------------------------------

MOTION\_MODELS START\_TIME END\_TIME PLOT\_FORMAT FORCE\_SUMMARIES

0 0.000E+00 0.100E+01 1 0

MONITOR\_POINTS FORCE\_BY\_SECTIONS

0 0

-------------------------------------------------------------------------------

Cycle Output-Control Flags

-------------------------------------------------------------------------------

RESTART FREQ UNIQUE FILES CHIMERA HOLE-CUT FREQ 6DOF OUTPUT FREQ

100 F Never 1

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Tolerances

-------------------------------------------------------------------------------

TINY\_LIMIT BIG\_LIMIT GEOM\_MINIMUM CONVERGENCE\_EPSILON

0.100E-19 0.100E+21 0.100E-19 0.100E-19

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Tolerances for Chimera Hole Cutting

-------------------------------------------------------------------------------

EPSILON\_DIST EPSILON\_AREA EPSILON\_RATIO

0.100E-13 0.100E-04 0.100E-04

-------------------------------------------------------------------------------

Thermo and Transport

-------------------------------------------------------------------------------

Gas\_Model

5 (reacting)

Coupled

T

Thermo-database Number-of-Species Number-of-Mixtures

1 (molecular) 5 1

-------------------------------------------------------------------------------

Gaseous Species List

-------------------------------------------------------------------------------

N

N2

NO

O

O2

-------------------------------------------------------------------------------

Mixture Definitions

-------------------------------------------------------------------------------

Mixture # 1: 'Mixture1'

Species Name Mass Fraction

N 0.10000E-02

N2 0.74700

NO 0.10000E-02

O 0.10000E-02

O2 0.25000

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Reaction Definition

-------------------------------------------------------------------------------

REACTION NAME : Reactions

NUMBER OF REACTION STEPS : 5

REACTION STEP 1

REACTION RATE TYPE : GENERAL

Reactant Stiochiometric Coefficient

N 0.00000E+00

N2 0.10000E+01

NO 0.00000E+00

O 0.00000E+00

O2 0.00000E+00

Product Stiochiometric Coefficient

N 0.20000E+01

N2 0.00000E+00

NO 0.00000E+00

O 0.00000E+00

O2 0.00000E+00

FORWARD RATE CONSTANTS

Pre-exponent (A): 0.36000E+19

Temperature Exponent (n): -0.16000E+01

Activation Temperature (E/R): 0.11320E+06

Tt-Tv factor : 0.00000E+00

THIRD BODY EFFICIENCIES

Species Name Efficiency

N 0.30000E+01

N2 0.10000E+01

NO 0.10000E+01

O 0.30000E+01

O2 0.10000E+01

REACTANT CONCENTRATION EXPONENTS

Species Name Exponent

N 0.00000E+00

N2 0.10000E+01

NO 0.00000E+00

O 0.00000E+00

O2 0.00000E+00

BACKWARD RATE BY EQUILIBRIUM

PRODUCT CONCENTRATION EXPONENTS

Species Name Exponent

N 0.20000E+01

N2 0.00000E+00

NO 0.00000E+00

O 0.00000E+00

O2 0.00000E+00

REACTION STEP 2

REACTION RATE TYPE : GENERAL

[WARNING]: (cheminit) Specified concentration exponents do not look balanced

for species: O

Reactant-side stoichiometric coefficient (v')=

0.000000000000000E+000

Product-side stoichiometric coefficient (v'')=

2.00000000000000

--> Product-Reaction (v'' - v') = 2.00000000000000

Reactant-side concentration exponent (alpha')=

0.000000000000000E+000

Product-side concentration coefficient (alpha'')=

1.00000000000000

--> Product-Reaction (a'' - a') = -1.00000000000000

WHEN USING GENERAL RATES, BE CAREFUL THAT YOU DO NOT CREATE MASS.

Reactant Stiochiometric Coefficient

N 0.00000E+00

N2 0.00000E+00

NO 0.00000E+00

O 0.00000E+00

O2 0.10000E+01

Product Stiochiometric Coefficient

N 0.00000E+00

N2 0.00000E+00

NO 0.00000E+00

O 0.20000E+01

O2 0.00000E+00

FORWARD RATE CONSTANTS

Pre-exponent (A): 0.27500E+17

Temperature Exponent (n): -0.10000E+01

Activation Temperature (E/R): 0.59500E+05

Tt-Tv factor : 0.00000E+00

THIRD BODY EFFICIENCIES

Species Name Efficiency

N 0.20000E+01

N2 0.10000E+01

NO 0.10000E+01

O 0.20000E+01

O2 0.10000E+01

REACTANT CONCENTRATION EXPONENTS

Species Name Exponent

N 0.00000E+00

N2 0.00000E+00

NO 0.00000E+00

O 0.00000E+00

O2 0.10000E+01

BACKWARD RATE CONSTANTS

Pre-exponent (A): 0.00000E+00

Temperature Exponent (n): 0.00000E+00

Activation Temperature (E/R): 0.00000E+00

PRODUCT CONCENTRATION EXPONENTS

Species Name Exponent

N 0.00000E+00

N2 0.00000E+00

NO 0.00000E+00

O 0.10000E+01

O2 0.00000E+00

REACTION STEP 3

REACTION RATE TYPE : GENERAL

Reactant Stiochiometric Coefficient

N 0.00000E+00

N2 0.00000E+00

NO 0.10000E+01

O 0.00000E+00

O2 0.00000E+00

Product Stiochiometric Coefficient

N 0.10000E+01

N2 0.00000E+00

NO 0.00000E+00

O 0.10000E+01

O2 0.00000E+00

FORWARD RATE CONSTANTS

Pre-exponent (A): 0.23000E+15

Temperature Exponent (n): -0.50000E+00

Activation Temperature (E/R): 0.75500E+05

Tt-Tv factor : 0.00000E+00

THIRD BODY EFFICIENCIES

Species Name Efficiency

N 0.00000E+00

N2 0.00000E+00

NO 0.00000E+00

O 0.00000E+00

O2 0.00000E+00

REACTANT CONCENTRATION EXPONENTS

Species Name Exponent

N 0.00000E+00

N2 0.00000E+00

NO 0.10000E+01

O 0.00000E+00

O2 0.00000E+00

BACKWARD RATE CONSTANTS

Pre-exponent (A): 0.00000E+00

Temperature Exponent (n): 0.00000E+00

Activation Temperature (E/R): 0.00000E+00

PRODUCT CONCENTRATION EXPONENTS

Species Name Exponent

N 0.10000E+01

N2 0.00000E+00

NO 0.00000E+00

O 0.10000E+01

O2 0.00000E+00

REACTION STEP 4

REACTION RATE TYPE : GENERAL

Reactant Stiochiometric Coefficient

N 0.00000E+00

N2 0.10000E+01

NO 0.00000E+00

O 0.10000E+01

O2 0.00000E+00

Product Stiochiometric Coefficient

N 0.10000E+01

N2 0.00000E+00

NO 0.10000E+01

O 0.00000E+00

O2 0.00000E+00

FORWARD RATE CONSTANTS

Pre-exponent (A): 0.31800E+11

Temperature Exponent (n): 0.10000E+00

Activation Temperature (E/R): 0.37700E+05

Tt-Tv factor : 0.00000E+00

REACTANT CONCENTRATION EXPONENTS

Species Name Exponent

N 0.00000E+00

N2 0.10000E+01

NO 0.00000E+00

O 0.10000E+01

O2 0.00000E+00

BACKWARD RATE CONSTANTS

Pre-exponent (A): 0.00000E+00

Temperature Exponent (n): 0.00000E+00

Activation Temperature (E/R): 0.00000E+00

PRODUCT CONCENTRATION EXPONENTS

Species Name Exponent

N 0.10000E+01

N2 0.00000E+00

NO 0.10000E+01

O 0.00000E+00

O2 0.00000E+00

REACTION STEP 5

REACTION RATE TYPE : GENERAL

Reactant Stiochiometric Coefficient

N 0.00000E+00

N2 0.00000E+00

NO 0.10000E+01

O 0.10000E+01

O2 0.00000E+00

Product Stiochiometric Coefficient

N 0.10000E+01

N2 0.00000E+00

NO 0.00000E+00

O 0.00000E+00

O2 0.10000E+01

FORWARD RATE CONSTANTS

Pre-exponent (A): 0.21600E+06

Temperature Exponent (n): 0.12900E+01

Activation Temperature (E/R): 0.19220E+05

Tt-Tv factor : 0.00000E+00

REACTANT CONCENTRATION EXPONENTS

Species Name Exponent

N 0.00000E+00

N2 0.00000E+00

NO 0.10000E+01

O 0.10000E+01

O2 0.00000E+00

BACKWARD RATE CONSTANTS

Pre-exponent (A): 0.00000E+00

Temperature Exponent (n): 0.00000E+00

Activation Temperature (E/R): 0.00000E+00

PRODUCT CONCENTRATION EXPONENTS

Species Name Exponent

N 0.10000E+01

N2 0.00000E+00

NO 0.00000E+00

O 0.00000E+00

O2 0.10000E+01

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Zone Control

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Zone Number Subcycles CFL\_Start/dt CFL\_End/dt Ramping Cycles

1 1 0.100E+00 0.100E+01 2000

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ZONE: 1

-------------------------------------------------------------------------------

Zone CellType Chimera Moves/Deforms T\_Scheme nStage Inner Inntol

1 1 0 0 6 1 20 0.10E-03

Ivisc Flux S\_scheme Limit\_N Limit\_L Entf\_L Entf\_N Kappa

0 1 4 1 1 0.30 0.30 0.00

Initial solution will be set using specified constant values:

U Velocity (x) V Velocity (y) W Velocity (z) Static P (Pa) Static T (K)

7000.0 0.0000 0.0000 0.52500E+01 219.70

Temperature\_internal

0.21970E+03

Mixture Number Mixture Name

1 Mixture1

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Grid Type: Quadrilaterals/Structured

Zone I-Dimension J-Dimension K-Dimension Cells

---- ----------- ----------- ----------- -----

1 150 100 2 14751

Total Cell Count: 14751

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\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* S I M U L A T I O N S T A R T U P \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

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--- Setting zonal data for zone 1 to user-specified constant values.

--- Allocating Q, XYZ, AREA, VOL

Allocated 0.415 8-byte MWords for zone 1

--- Estimating memory for time-integration

Requires 1.92 8-byte MWords

--- Allocating IBLANK, IFPOIN, ICPOIN, IFCELL

Allocated 0.300E-01 4-byte MWords for zone 1

--- TOTAL: 2.333 8-byte MWords.

--- TOTAL: 0.030 4-byte MWords.

--- SUM TOTAL: 18.783 MBytes.