Discretization Variables Constraints 100 507 405

4510

404

2004

606

3006

910

4510

506

2506

405

2005

404

2004

304

1504

NaN

NaN

NaN

NaN

NaN

500 2507 100

500

100

500

100

500

100

500

100

500

100

500

100

500

100

500

NaN

NaN

NaN

NaN

NaN

Model

cart\_pendulum

cart\_pendulum

robot

robot

electrical vehicle

electrical\_vehicle

double\_oscillator

double\_oscillator

ducted\_fan

 $ducted_{-}fan$ 

steering

steering

rocket

rocket

chain

chain

dielectrophoretic\_particle

dielectrophoretic\_particle

truck

quadrotorp2p moonlander

glider space\_shuttle

2005 910 612

3012

305

1505

503

2503

713

3513

408

2008

304

1504

305

1505

203

1003

NaN

NaN

NaN

NaN

NaN

495 75 649

16

1000

5

5

162

163

11

17

21

77

14

38

38

NaN

NaN

NaN

NaN

NaN

Benchmark OptimalControl Results max iter = 1000, tol = 1.0e-8, constr viol tol = 1.0e-6, solver = ma57

Iterations

237

Total Time

1.49

14.7

0.97

28.38

2.1

14.45

1.02

1.06

5.89

127.04

0.43

1.88

0.09

7.56

0.3

0.23

0.71

1.98

NaN

NaN

NaN

NaN

NaN

Ipopt Time

1.34

13.95

0.65

24.4

0.17

14.27

0.09

0.16

1.3

126.53

0.1

1.5

0.06

7.32

0.04

0.15

0.11

1.86

NaN

NaN

NaN

NaN

NaN

Objective Value

1.74413

1.74373

9.14269

9.14099

1.22905e6

231779.0

0.000908244

0.000910921

1832.95

1831.66

0.554595

0.554572

1.01283

1.01284

5.06978

5.06858

-9.97699e-9

-9.99545e-9

NaN

NaN

NaN

NaN

NaN

Solve Succeeded Solve Succeeded Solve Succeeded Iterations Exceeded Solve Succeeded Solve Succeeded

Infeasible Problem

Infeasible Problem

NaN

NaN

NaN

NaN

NaN

Flag

Solve Succeeded

Solve Succeeded