

# ALTO MARINE DAMPERS

## Borg Warner Velvet Drive

### DA-101

Application	OEM
DAMPER BW VELVET DRIVE MARINE	1004-650-001



### DA-102

Application	OEM
DAMPER BW VELVET DRIVE MARINE	1004-650-002



### DA-103

Application	OEM
DAMPER BW VELVET DRIVE MARINE	1004-650-003



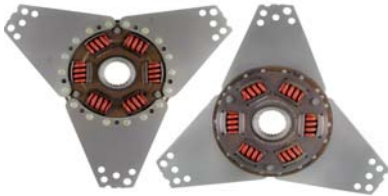
### DA-106

Application	OEM
DAMPER BW VELVET DRIVE MARINE	1004-650-006



### DA-106A

Application	OEM
DAMPER BW VELVET DRIVE MARINE	AS8-K2C



### DA-107

Application	OEM
DAMPER BW VELVET DRIVE MARINE (Purple Spring)	1004-650-007



### DA-108

Application	OEM
DAMPER BW VELVET DRIVE MARINE (White Spring)	1004-650-008



# ALTO MARINE DAMPERS

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## Volvo Penta

### DA-206

Application	OEM
DAMPER VOLVO PENTA MARINE	855389-3



## Hurth Marine

### DA-301

Application	OEM
DAMPER HURTH MARINE	254750



### DA-302

Application	OEM
DAMPER HURTH MARINE	254762



### DA-303

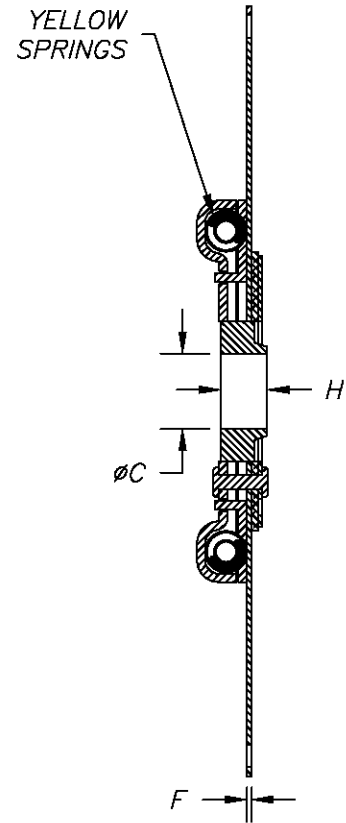
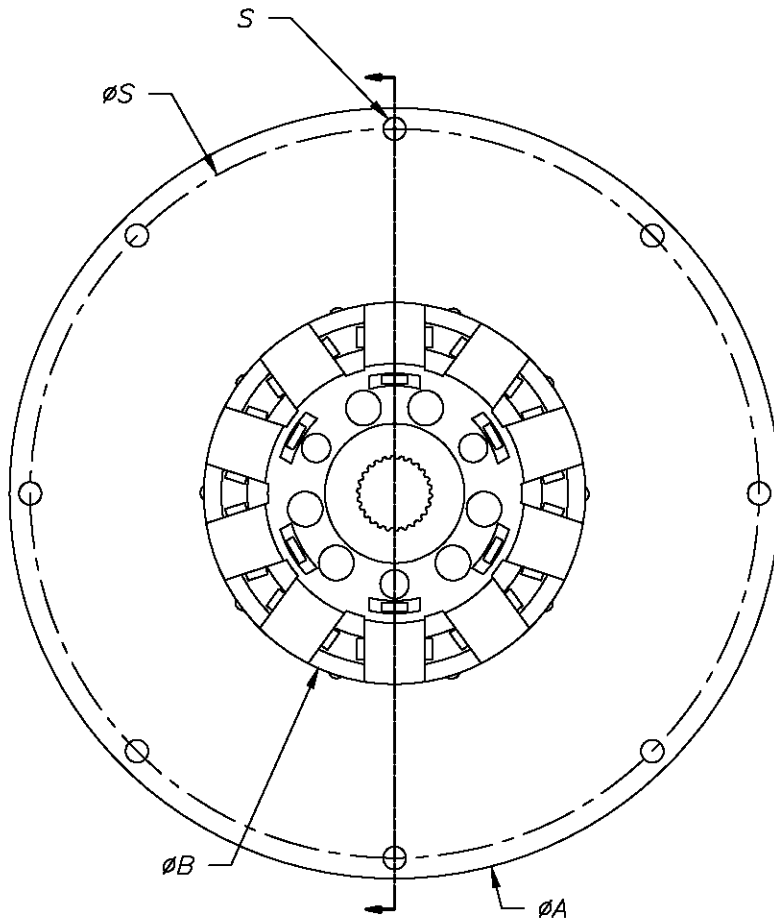
Application	OEM
DAMPER HURTH MARINE	288240



### DA-305

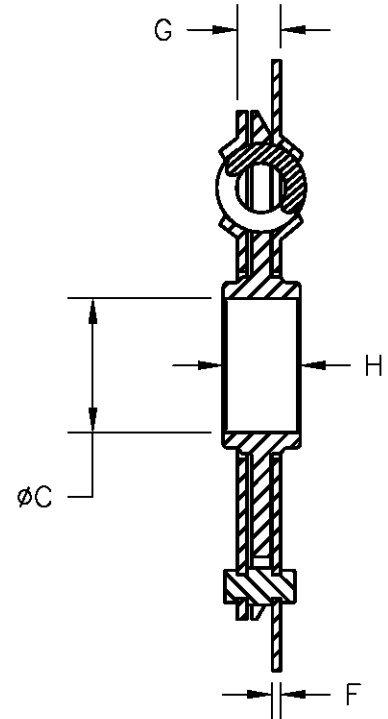
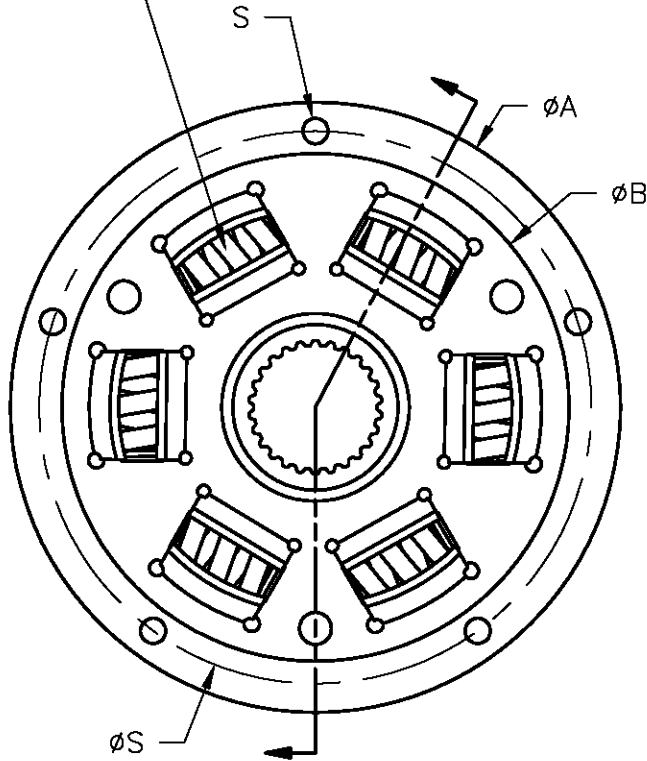
Application	OEM
DAMPER HURTH MARINE	1866-052-002





DAMPER INFORMATION						THCK G:	APPLICATION	
TEETH: 26		TORQUE: 350 ft lb 474.536 Nm			THCK H:	DAMPER		
DIA A: 13.87 [362.30]		HOLE 0.406 [10.31]	DIA S:	THCK G: N/A N/A				
DIA B: 6.872 [174.55]	HOLE N/A DIA T:	N/A	DIA X: N/A	HOLE N/A DIA Y:	N/A	OAT: N/A N/A	SCALE: NONE	
DIA C: 1.353 [34.37]	HOLE N/A DIA U:	N/A	HOLE 13.123 CEN. S: [333.32]	HOLE N/A CEN. X:	N/A	DRAWN BY: <b>JMS</b>		CHECKED BY: <b>CDH</b>
DIA D: N/A	HOLE N/A DIA V:	N/A	HOLE N/A CEN. T: N/A	HOLE N/A CEN. Y:	N/A	ALTO PRODUCTS CORP.		PART NUMBER
DIA E: N/A	HOLE N/A DIA W:	N/A	HOLE N/A CEN. U: N/A	THCK F: 0.084 [2.13]			<b>DA-101</b>	
								REV: IR

ORANGE  
SPRING



**DAMPER INFORMATION**

THCK G: 0.440  
[11.18]

**APPLICATION**  
DAMPER

TEETH: 26

TORQUE: 332 ft lb  
450.131 Nm

THCK H: 0.780  
[19.81]

NOTES:  
OEM # 1004-650-002  
OEM # AS4-K1C

DIA A: 6.18 [156.97]	HOLE DIA S: 0.258 [8.55]	HOLE DIA X: N/A	HOLE DIA Y: N/A	HOLE DIA Z: N/A	HOLE DIA W: N/A
DIA B: 5.145 [130.68]	HOLE DIA T: N/A	HOLE DIA Y: N/A	HOLE DIA X: N/A	HOLE DIA Z: N/A	HOLE DIA W: N/A
DIA C: 1.35 [34.29]	HOLE DIA U: N/A	HOLE DIA S: 5.595 [142.11]	HOLE DIA X: N/A	HOLE DIA Z: N/A	HOLE DIA W: N/A
DIA D: N/A	HOLE DIA V: N/A	HOLE DIA T: N/A	HOLE DIA Y: N/A	HOLE DIA Z: N/A	HOLE DIA W: N/A
DIA E: N/A	HOLE DIA W: N/A	HOLE DIA U: N/A	HOLE DIA X: N/A	THCK F: 0.083 [2.11]	

OAT: 0.865  
[21.97]

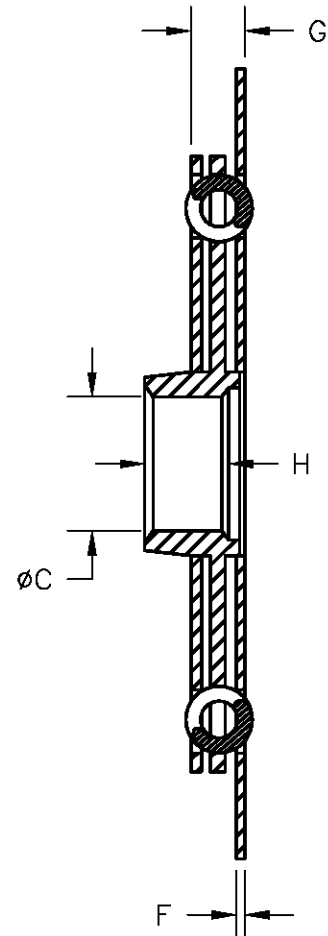
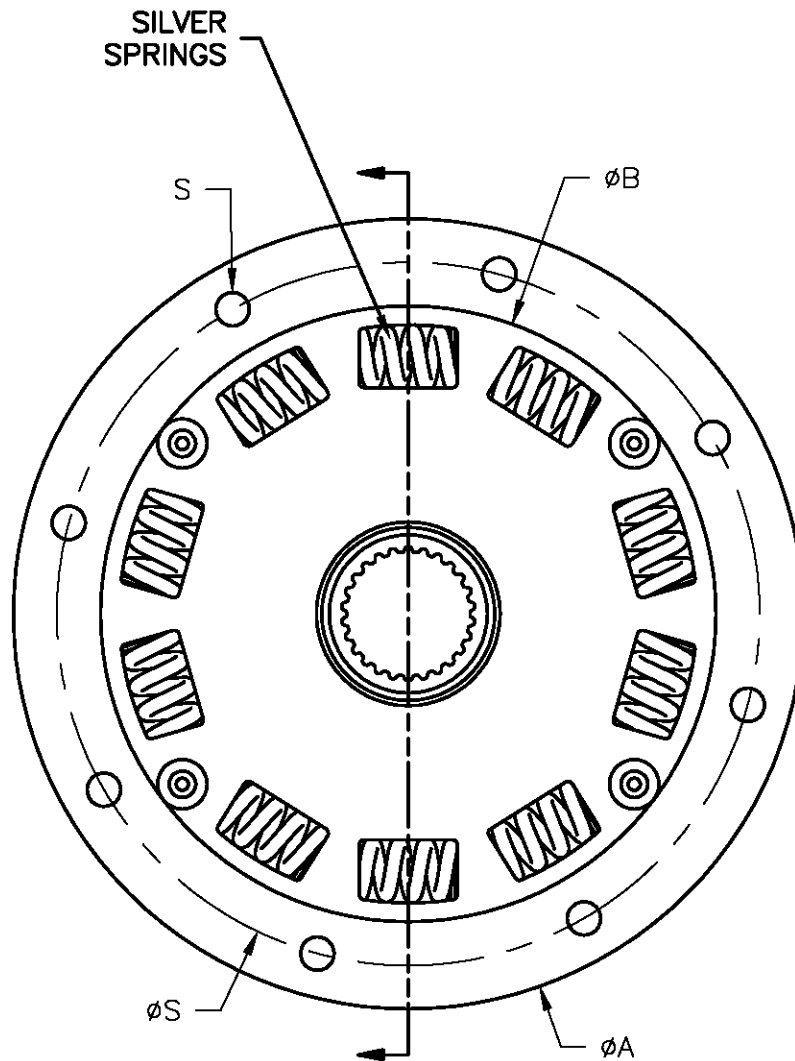
SCALE: NONE

DRAWN BY: **JMS**

CHECKED BY: **CDH**



PART NUMBER  
**DA-102**  
REV: IR



### DAMPER INFORMATION

THCK G: 0.540  
[13.72]  
THCK H: 0.780  
[19.81]  
OAT: 1.160  
[29.46]

## APPLICATION

### DAMPER

NOTES:  
OEM # 1004-650-003

SCALE: NONE

DRAWN BY:

**JMS**

CHECKED BY:

**CDH**

ALTO PRODUCTS CORP.



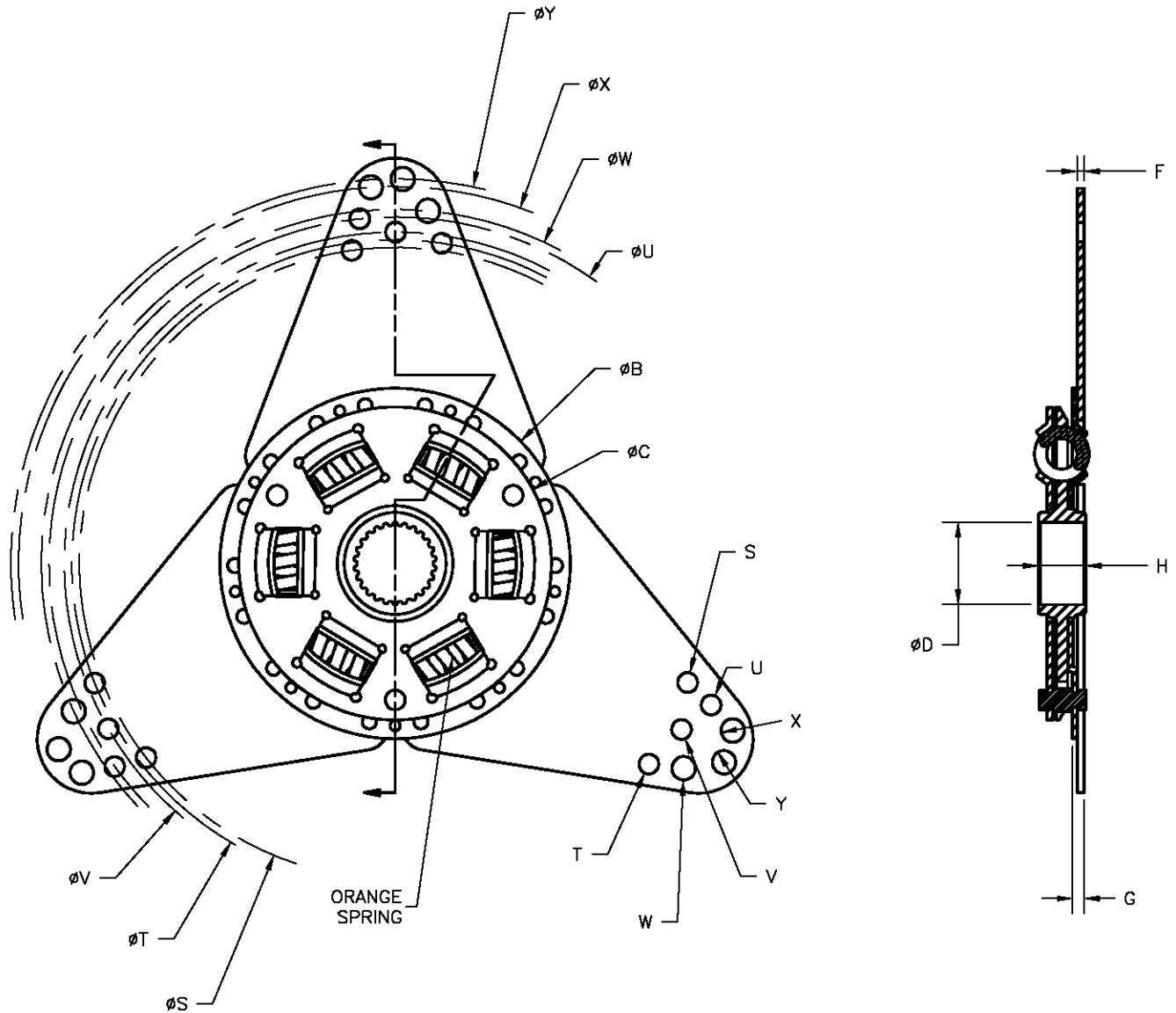
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Atmore, AL 36504  
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PART NUMBER

**DA-103**

REV: IR

TEETH:	26		TORQUE: 350 ft lb 474.536 Nm	
DIA A:	8.000 [203.20]	HOLE DIA S: 0.340 [8.64]	HOLE DIA X: N/A	HOLE CEN. V: N/A
DIA B:	6.235 [158.37]	HOLE DIA T: N/A	HOLE DIA Y: N/A	HOLE CEN. W: N/A
DIA C:	1.35 [34.29]	HOLE DIA U: N/A	HOLE CEN. S: 7.121 [180.87]	HOLE CEN. X: N/A
DIA D:	N/A	HOLE DIA V: N/A	HOLE CEN. T: N/A	HOLE CEN. Y: N/A
DIA E:	N/A	HOLE DIA W: N/A	HOLE CEN. U: N/A	THCK F: 0.083 [2.11]



### DAMPER INFORMATION

TEETH: 26		TORQUE: 332 ft lb 450.131 Nm	
DIA A: N/A	HOLE 0.326	HOLE 0.387	HOLE 10.875
N/A	DIA S: [8.28]	DIA X: [9.83]	CEN. V: [276.23]
DIA B: 5.755	HOLE 0.326	HOLE 0.387	HOLE 11.625
[146.18]	DIA T: [8.28]	DIA Y: [9.83]	CEN. W: [295.28]
DIA C: 5.140	HOLE 0.326	HOLE 10.375	HOLE 12.375
[130.56]	DIA U: [8.28]	CEN. S: [263.53]	CEN. X: [314.33]
DIA D: 1.353	HOLE 0.326	HOLE 10.625	HOLE 12.625
[34.37]	DIA V: [8.28]	CEN. T: [269.88]	CEN. Y: [320.68]
DIA E: N/A	HOLE 0.387	HOLE 11.375	THCK F: 0.113
N/A	DIA W: [9.83]	CEN. U: [288.93]	[2.87]

THCK G: 0.193 [4.90]
THCK H: 0.800 [20.32]
OAT: 0.975 [24.77]
SCALE: NONE

### APPLICATION DAMPER

NOTES:  
OEM # 1004-650-006  
OEM # AS4-K2C

DRAWN BY: **JMS**

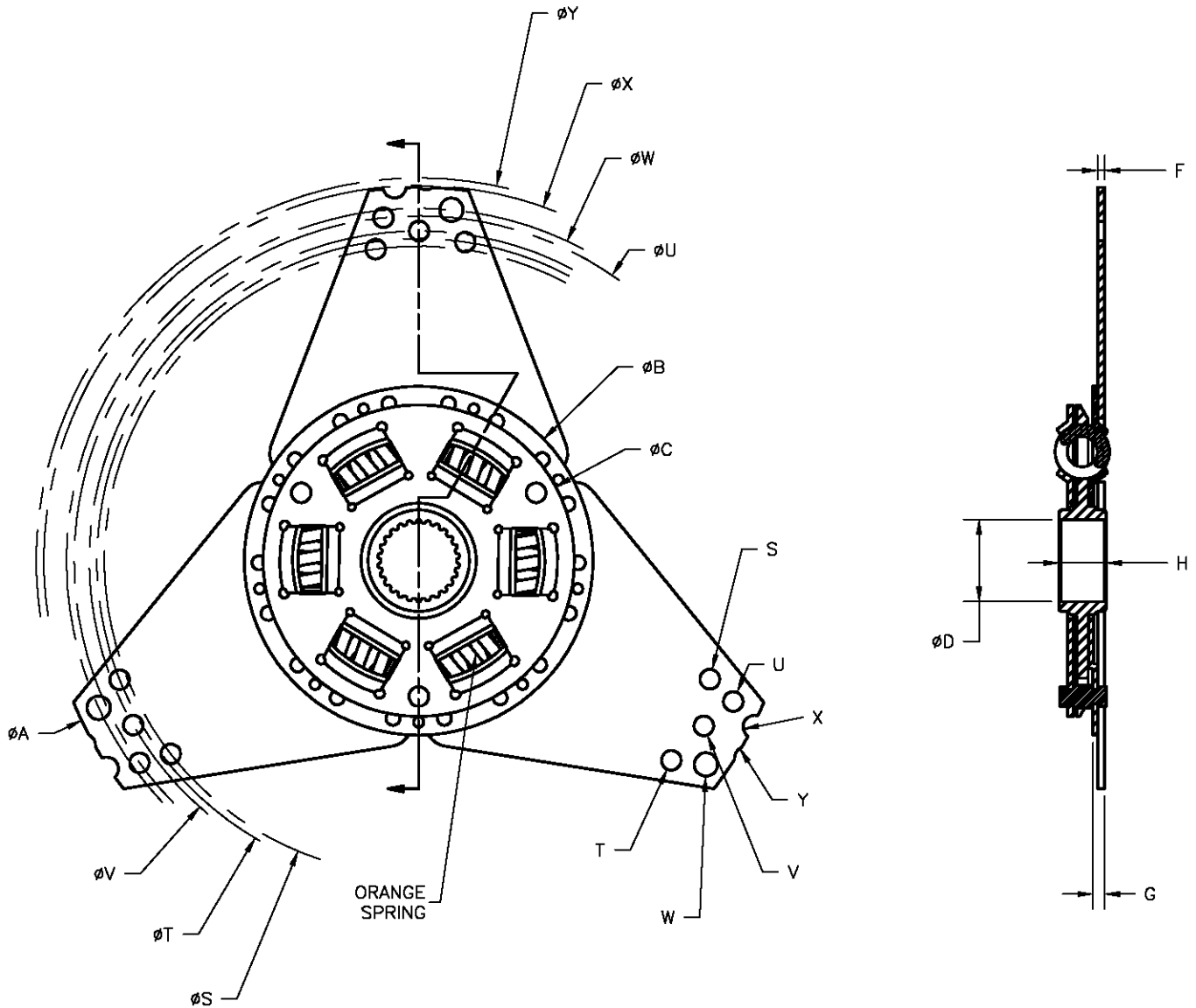
CHECKED BY: **CDH**



PART NUMBER

**DA-106**

REV: IR



### DAMPER INFORMATION

THCK G: 0.193  
[4.90]

### APPLICATION DAMPER

TEETH: 26

TORQUE: 332 ft lb  
450.131 Nm

THCK H: 0.800  
[20.32]

NOTES:  
OEM # 120-8-1446  
OEM # AS8-K2C

DIA A:	12.32 [312.93]	HOLE DIA S:	0.326 [8.28]	HOLE DIA X:	0.387 [9.83]	HOLE CEN. V:	10.875 [276.23]
DIA B:	5.755 [146.18]	HOLE DIA T:	0.326 [8.28]	HOLE DIA Y:	0.387 [9.83]	HOLE CEN. W:	11.625 [295.28]
DIA C:	5.140 [130.56]	HOLE DIA U:	0.326 [8.28]	HOLE CEN. S:	10.375 [263.53]	HOLE CEN. X:	12.375 [314.33]
DIA D:	1.353 [34.37]	HOLE DIA V:	0.326 [8.28]	HOLE CEN. T:	10.625 [269.88]	HOLE CEN. Y:	12.625 [320.68]
DIA E:	N/A	HOLE DIA W:	0.387 [9.83]	HOLE CEN. U:	11.375 [288.93]	THCK F:	0.113 [2.87]

OAT: 0.975  
[24.77]

SCALE: NONE

DRAWN BY:

JMS

CHECKED BY:

CDH

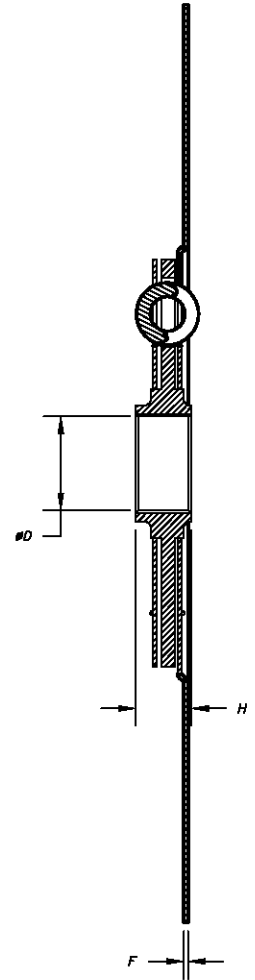
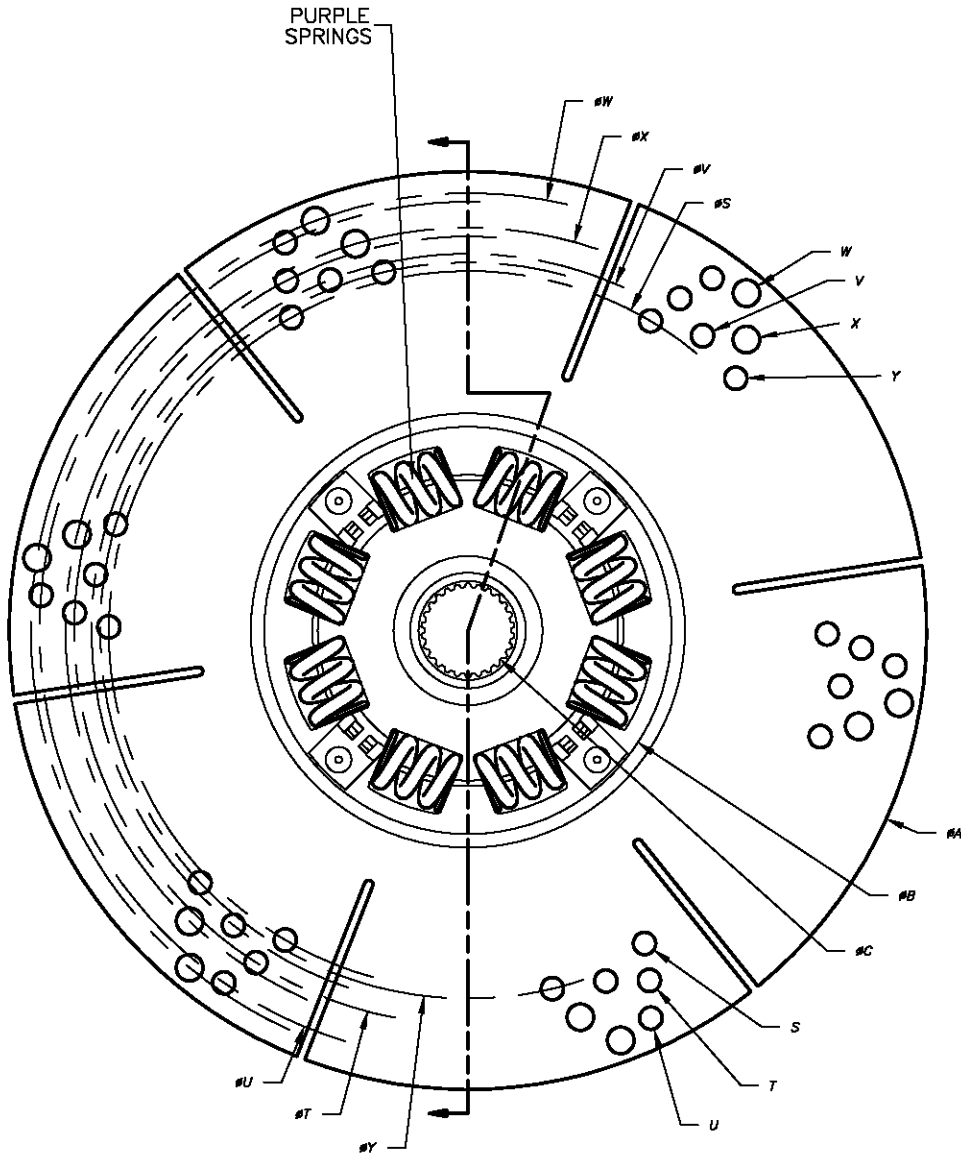
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PART NUMBER

**DA-106A**

REV: IR



### DAMPER INFORMATION

THCK G: N/A  
N/A  
THCK H: 0.800  
[20.32]  
OAT: 0.800  
[20.32]  
SCALE: NONE

### APPLICATION DAMPER

NOTES:  
OEM # 1004-650-007  
OEM # AS7-K2C

DRAWN BY: **JMS**

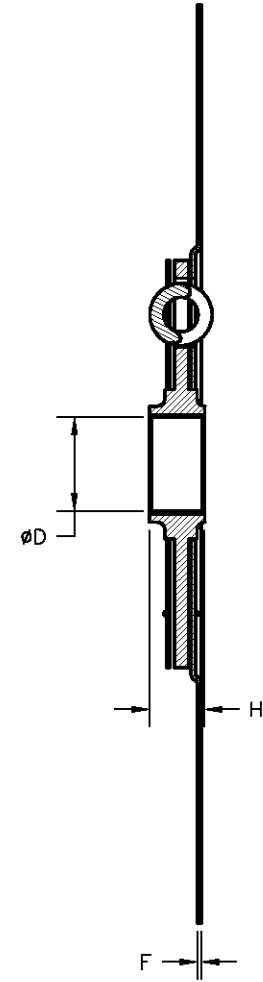
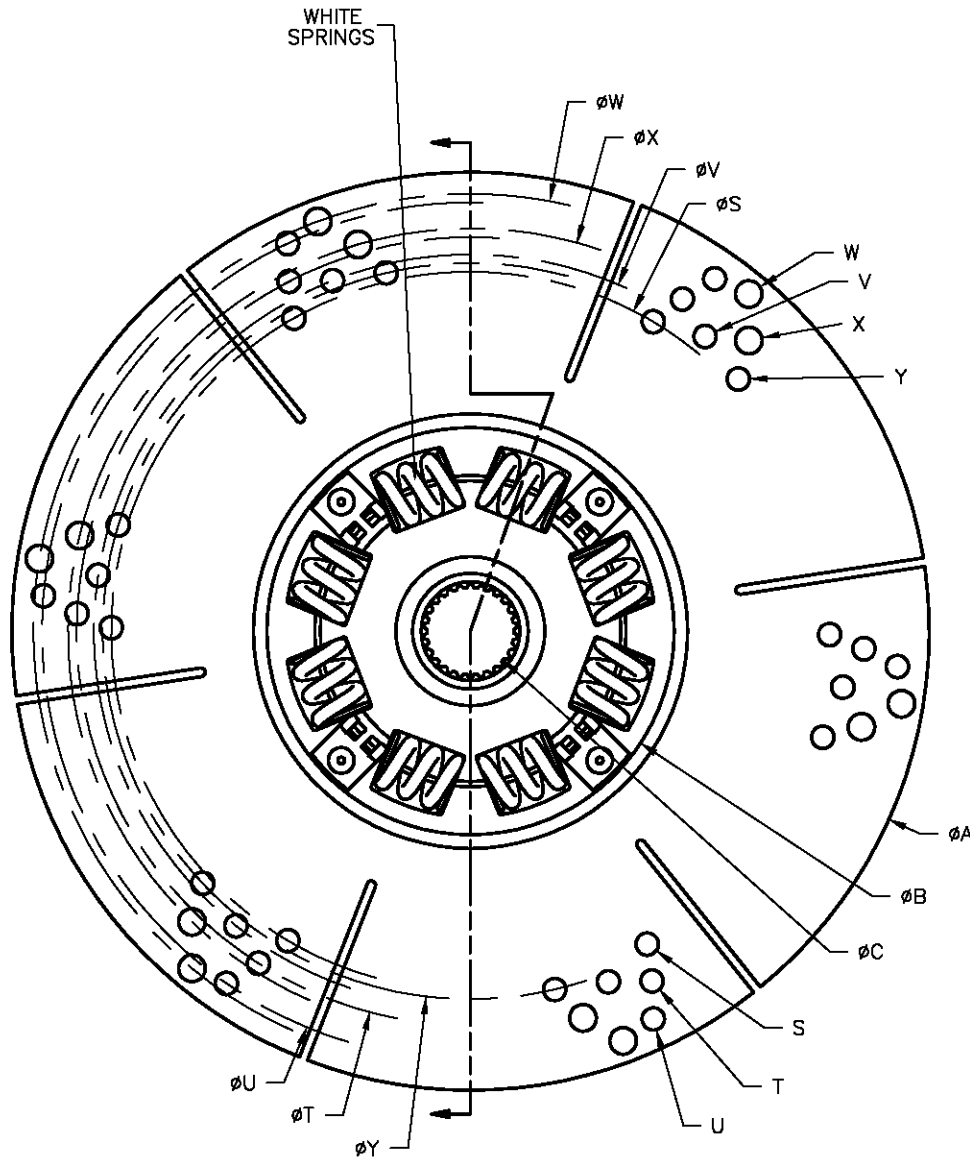
CHECKED BY: **CDH**

TEETH:	26		TORQUE:	450 ft lb 610.118 Nm	
DIA A:	13.25 [336.55]	HOLE DIA S:	0.325 [8.25]	HOLE DIA X:	0.388 [9.86]
DIA B:	5.880 [149.35]	HOLE DIA T:	0.325 [8.25]	HOLE DIA Y:	0.326 [8.28]
DIA C:	1.251 [31.78]	HOLE DIA U:	0.326 [8.28]	HOLE CEN. S:	10.375 [263.53]
DIA D:	1.353 [34.37]	HOLE DIA V:	0.325 [8.25]	HOLE CEN. T:	11.375 [288.93]
DIA E:	N/A	HOLE DIA W:	0.388 [9.86]	HOLE CEN. U:	12.375 [314.33]
				HOLE CEN. V:	10.875 [276.23]
				HOLE CEN. X:	12.625 [320.68]
				HOLE CEN. Y:	11.625 [295.28]
				HOLE CEN. Z:	10.625 [269.88]
				THCK F:	0.063 [1.60]

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PART NUMBER  
**DA-107**  
REV: IR





**DAMPER INFORMATION**

THCK G: N/A  
 THCK H: 0.800 [20.32]  
 OAT: NA  
 SCALE: NONE

**APPLICATION**  
 DAMPER

**NOTES:**  
 OEM # 1004-650-008  
 OEM # AS5-K2C

DRAWN BY: **JMS**

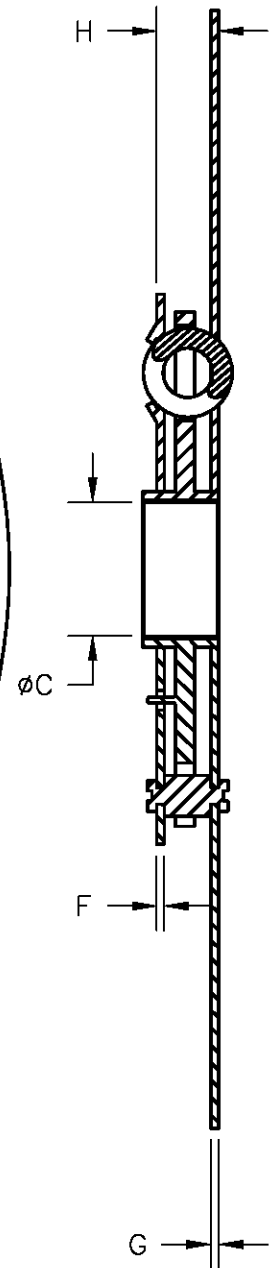
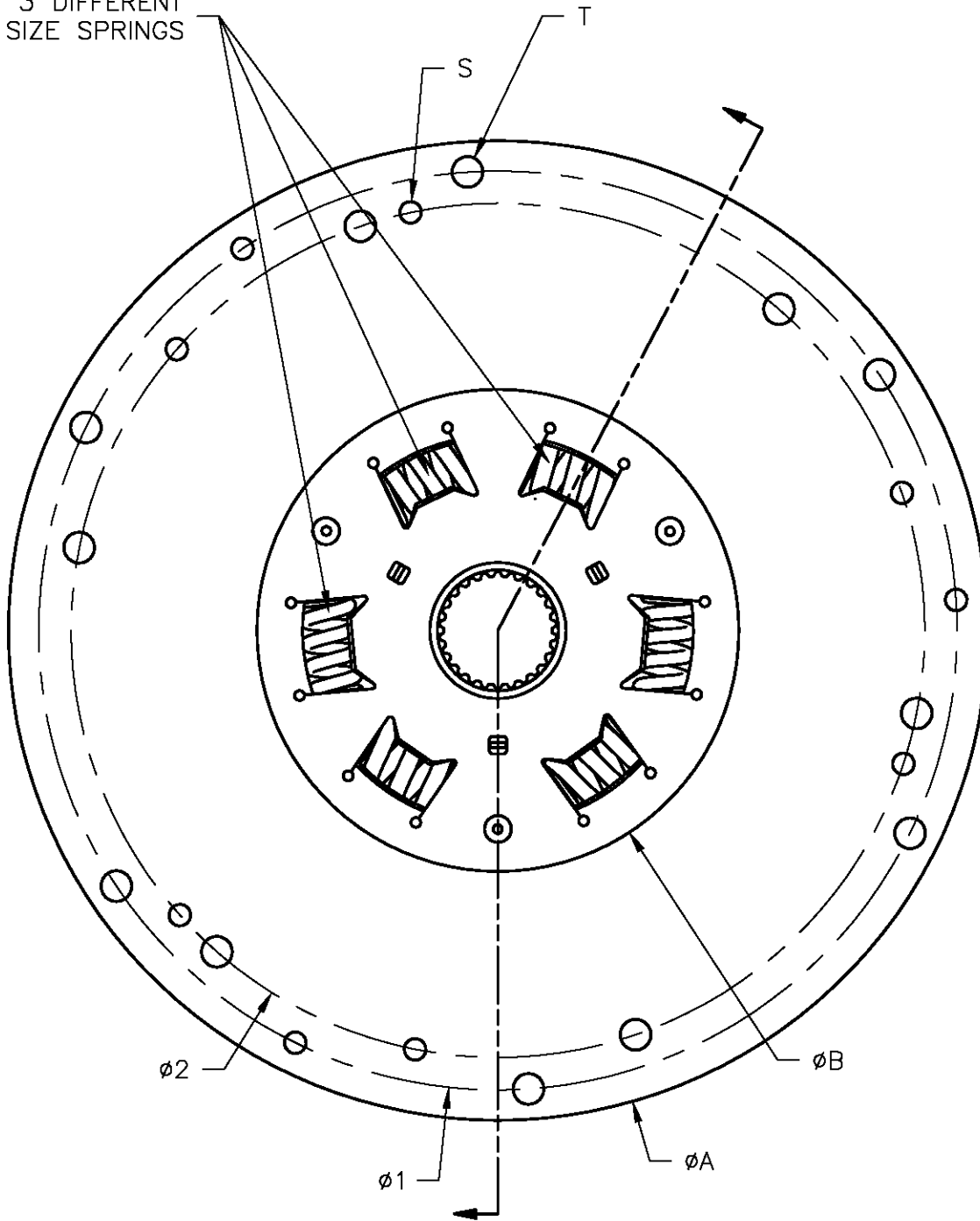
CHECKED BY: **CDH**

TEETH: 26		TORQUE: 450 ft lb 610.118 Nm	
DIA A: 13.24 [336.55]	HOLE 0.322 [8.18]	HOLE 0.388 [9.86]	HOLE 10.875 [276.23]
DIA B: 5.880 [149.35]	HOLE 0.322 [8.18]	HOLE 0.322 [8.18]	HOLE 12.625 [320.68]
DIA C: 1.251 [31.78]	HOLE 0.322 [8.22]	HOLE 10.375 [263.53]	HOLE 11.625 [295.28]
DIA D: 1.353 [34.37]	HOLE 0.322 [8.18]	HOLE 11.375 [288.93]	HOLE 10.625 [269.88]
DIA E: N/A	HOLE 0.388 [9.86]	HOLE 12.375 [314.33]	THCK F: 0.063 [1.60]



PART NUMBER  
**DA-108**  
 REV: IR

3 DIFFERENT  
SIZE SPRINGS



### DAMPER INFORMATION

THCK G: 0.080  
[2.03]

### APPLICATION

DAMPER

TEETH: 26

TORQUE: 313 ft lb  
424.371 Nm

THCK H: 0.630  
[16.00]

NOTES:

OEM # 1866-032-231

OEM # 855389-3

DIA A:	11.315 [287.40]	HOLE DIA S:	0.250 [6.35]	HOLE DIA X:	N/A	HOLE CEN. V:	N/A
DIA B:	5.567 [141.40]	HOLE DIA T:	0.356 [9.04]	HOLE DIA Y:	N/A	HOLE CEN. W:	N/A
DIA C:	1.35 [34.29]	HOLE DIA U:	N/A	HOLE CEN. 1:	10.615 [269.62]	HOLE CEN. X:	N/A
DIA D:	N/A	HOLE DIA V:	N/A	HOLE CEN. 2:	9.865 [250.57]	HOLE CEN. Y:	N/A
DIA E:	N/A	HOLE DIA W:	N/A	HOLE CEN. U:	N/A	THCK F:	0.077 [1.96]

OAT: N/A  
N/A

SCALE: NONE

DRAWN BY:

JMS

CHECKED BY:

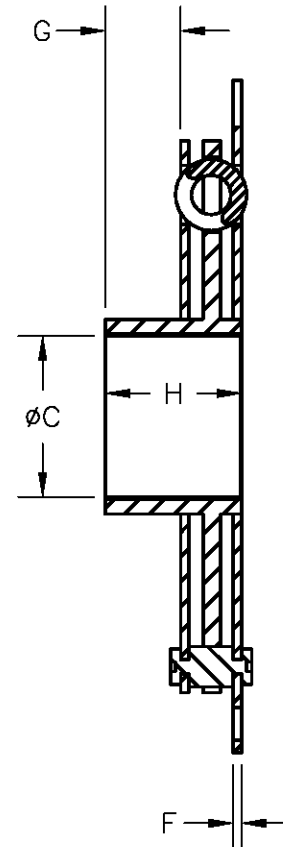
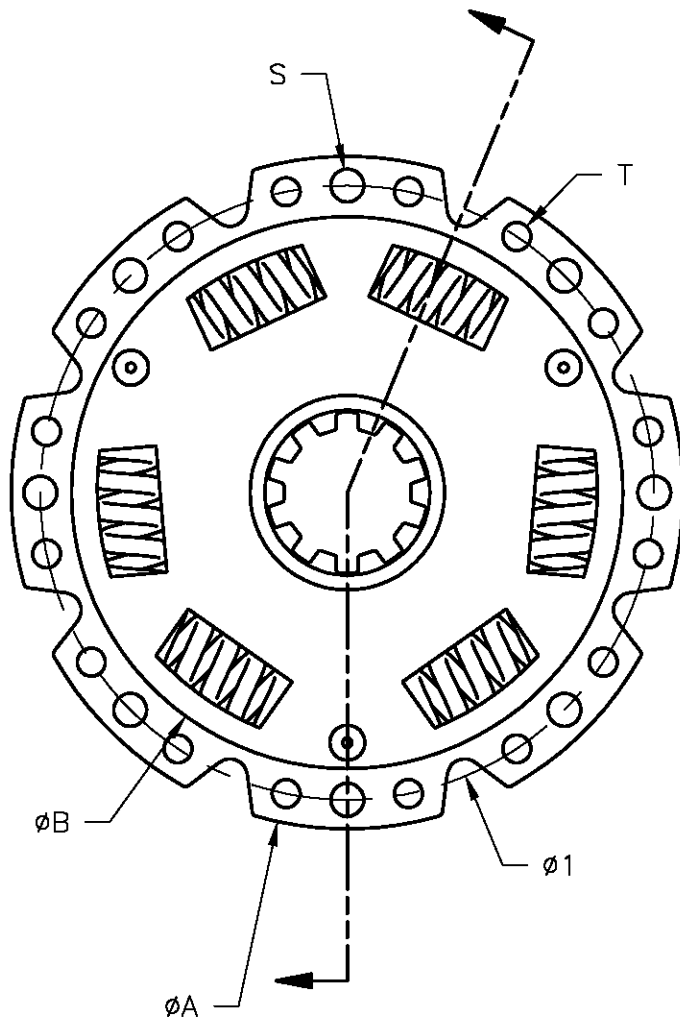
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PART NUMBER

**DA-206**

REV: IR



### DAMPER INFORMATION

THCK G: 0.512  
[13.00]

## APPLICATION

DAMPER

TEETH: 10

TORQUE: 121.5 ft lb  
164.731 Nm

THCK H: 0.984  
[25.00]

### NOTES:

OEM # 947-77-601-02  
OEM # 254750  
OEM # 1866-050-002

DIA A: 4.783 [121.50]	HOLE DIA S: 0.236 [5.99]	HOLE DIA X: N/A	HOLE DIA Y: N/A	HOLE CEN. V: N/A	OAT: N/A N/A
DIA B: 3.937 [100.00]	HOLE DIA T: 0.201 [5.11]	HOLE DIA Y: N/A	HOLE DIA Z: N/A	HOLE CEN. W: N/A	SCALE: NONE
DIA C: 1.141 [29.00]	HOLE DIA U: N/A	HOLE CEN. 1: 4.370 [111.00]	HOLE CEN. 2: N/A	HOLE CEN. X: N/A	DRAWN BY: JMS
DIA D: N/A	HOLE DIA V: N/A	HOLE CEN. T: N/A	HOLE CEN. U: N/A	HOLE CEN. Y: N/A	CHECKED BY: CDH
DIA E: N/A	HOLE DIA W: N/A	HOLE CEN. U: N/A	HOLE CEN. V: N/A	THCK F: 0.060 [1.52]	PART NUMBER DA-301

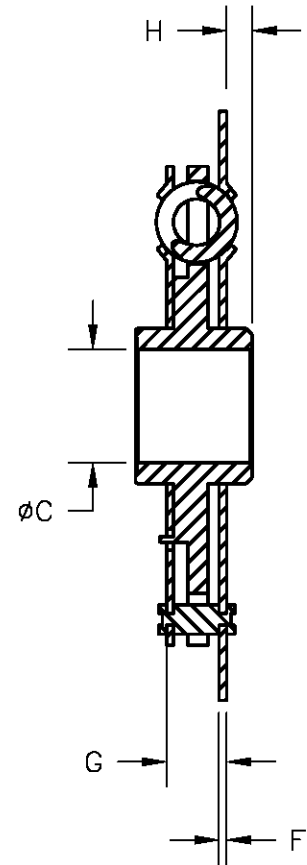
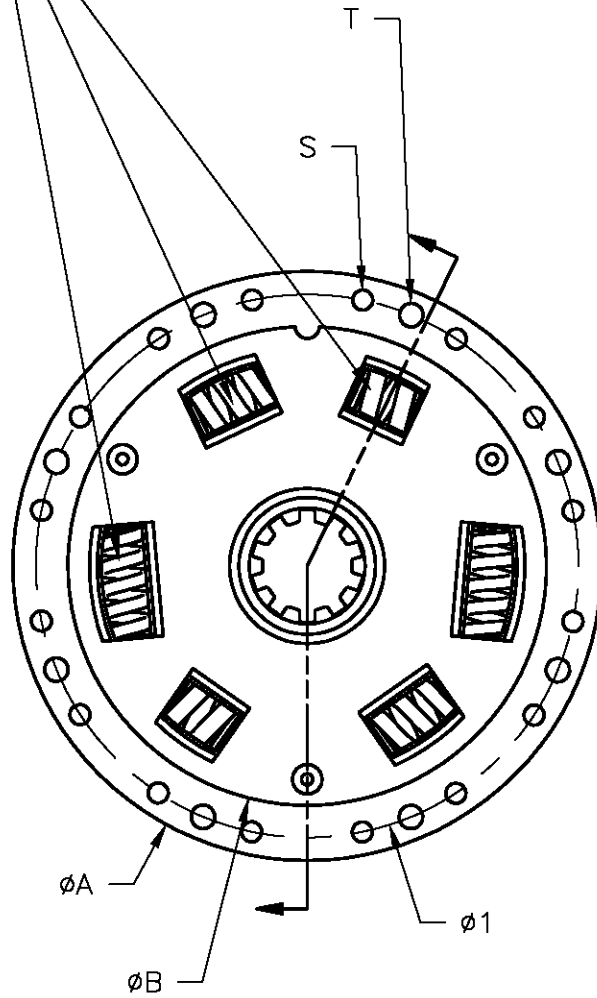
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PART NUMBER

DA-301

REV: IR

3 DIFFERENT  
SIZE SPRINGS



### DAMPER INFORMATION

THCK G: 0.595  
[15.11]

### APPLICATION

DAMPER

TEETH: 10

TORQUE: 147.5 ft lb  
199.983 Nm

THCK H: 0.257  
[6.53]

#### NOTES:

OEM # 947-44-601-03  
OEM # 254762  
OEM # 1866-052-001

OAT: 1.181  
[30.00]

SCALE: NONE

DRAWN BY:

JMS

CHECKED BY:

CDH

DIA A: 5.965 [151.51]	HOLE DIA S: 0.201 [5.11]	HOLE DIA X: N/A	HOLE CEN. V: N/A
DIA B: 4.843 [123.00]	HOLE DIA T: 0.236 [5.99]	HOLE DIA Y: N/A	HOLE CEN. W: N/A
DIA C: 1.145 [29.08]	HOLE DIA U: N/A	HOLE CEN. 1: 5.512 [140.00]	HOLE CEN. X: N/A
DIA D: N/A	HOLE DIA V: N/A	HOLE CEN. T: N/A	HOLE CEN. Y: N/A
DIA E: N/A	HOLE DIA W: N/A	HOLE CEN. U: N/A	THCK F: 0.079 [2.01]

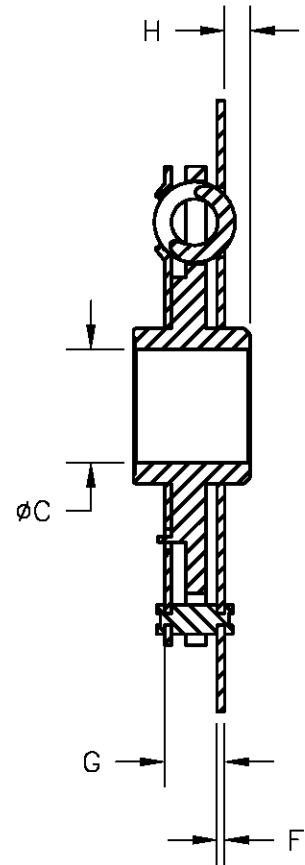
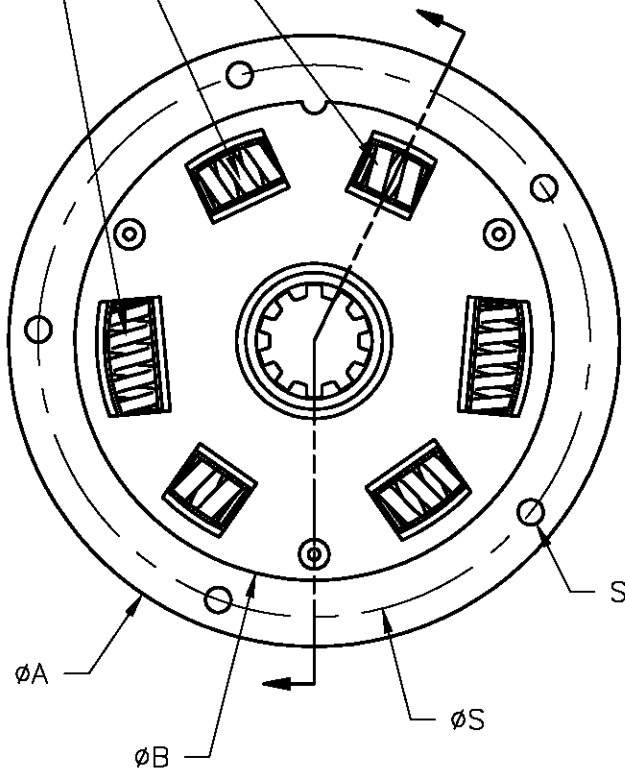
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PART NUMBER

**DA-302**

REV: IR

3 DIFFERENT  
SIZE SPRINGS



### DAMPER INFORMATION

THCK G: 0.565  
[14.35]

### APPLICATION DAMPER

TEETH: 10

TORQUE: 184.2 ft lb  
249.741 Nm

THCK H: 0.257  
[6.53]

NOTES:  
OEM # 288240  
OEM # 1866-061-001

DIA A: 6.189 [157.20]	HOLE DIA S: 0.257 [6.53]	HOLE DIA X: N/A	HOLE DIA Y: N/A	HOLE DIA Z: N/A	HOLE DIA W: N/A
DIA B: 4.848 [123.14]	HOLE DIA T: N/A	HOLE DIA Y: N/A	HOLE DIA Z: N/A	HOLE DIA W: N/A	HOLE DIA V: N/A
DIA C: 1.145 [29.08]	HOLE DIA U: N/A	HOLE DIA S: 5.593 [142.06]	HOLE DIA X: N/A	HOLE DIA Z: N/A	HOLE DIA W: N/A
DIA D: N/A	HOLE DIA V: N/A	HOLE DIA Y: N/A	HOLE DIA Z: N/A	HOLE DIA W: N/A	HOLE DIA U: N/A
DIA E: N/A	HOLE DIA W: N/A	HOLE DIA X: N/A	HOLE DIA Y: N/A	HOLE DIA Z: N/A	HOLE DIA V: N/A
					THCK F: 0.079 [2.01]

OAT: 1.181  
[30.00]

SCALE: NONE

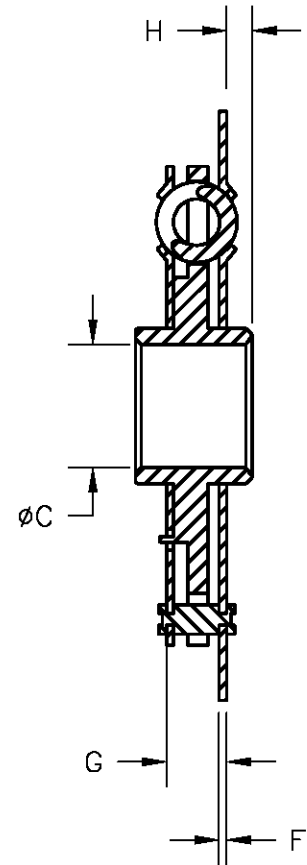
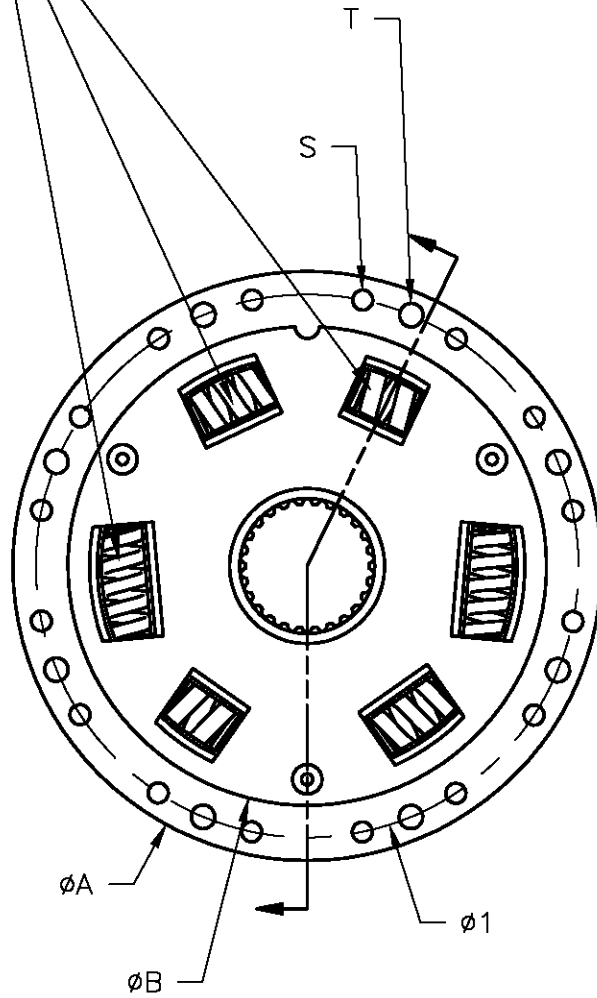
DRAWN BY: JMS

CHECKED BY: CDH



PART NUMBER  
**DA-303**  
REV: IR

3 DIFFERENT  
SIZE SPRINGS



### DAMPER INFORMATION

THCK G: 0.550  
[13.97]

TEETH: 26

TORQUE: 221.27 ft lb  
300 Nm

THCK H: 0.260  
[6.60]

OAT: 1.175  
[29.84]

SCALE: NONE

## APPLICATION DAMPER

NOTES:  
OEM #1866-052-002

DRAWN BY:

**BTB**

CHECKED BY:

**CDH**

DIA A:	5.962 [151.44]	HOLE DIA S:	0.205 [5.20]	HOLE DIA X:	N/A	HOLE CEN. V:	N/A
DIA B:	4.853 [123.26]	HOLE DIA T:	0.240 [6.096]	HOLE DIA Y:	N/A	HOLE CEN. W:	N/A
DIA C:	1.250 [31.75]	HOLE DIA U:	N/A	HOLE CEN. 1:	1.353 [34.36]	HOLE CEN. X:	N/A
DIA D:	N/A	HOLE DIA V:	N/A	HOLE CEN. T:	N/A	HOLE CEN. Y:	N/A
DIA E:	N/A	HOLE DIA W:	N/A	HOLE CEN. U:	N/A	THCK F:	0.075 [1.90]

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PART NUMBER

**DA-305**

REV: IR

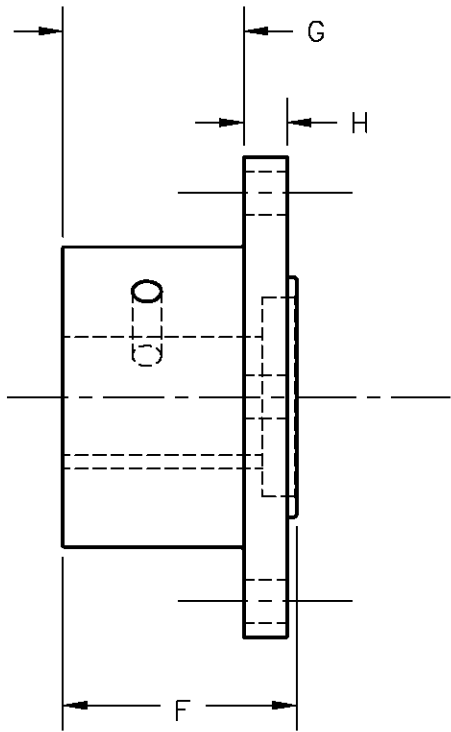
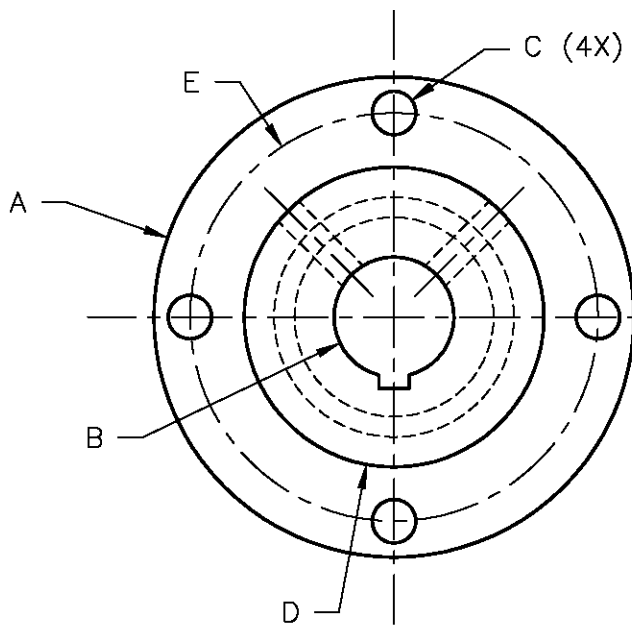
## MARINE COUPLINGS

### VELVET DRIVE ®

ALTO NO.	OEM NO.	DESCRIPTION	USAGE	NOTES
<b>COUPLINGS</b>				
023323	4547AY	Coupling 5 - MODEL 10-18 Only	1	
023324	4547BA	Coupling 4 - MODEL 10-17 Only	1	
023327	1000-031-001	Coupling - Current Reduction	1	Fine Spline
023328	4912	Coupling - Early Reduction	1	Fine Spline
023543-075	4BX-A	Coupling Shaft VD71/72 4" X .75 Bore		
023543-087	4BX-AA	Coupling Shaft VD 71/72 4" X .875 Bore		
023543-100	1866-052-002	Coupling Shaft VD71/72 4" X 1.00 Bore		
023543-125	4865DD 4BX-D	Coupling Shaft VD 71/72 4" X 1.25 Bore		
023559-125	4886D 5AX-D	Coupling Shaft VD 71/72 5" X 1.25 Bore		
023559-137	NA	Coupling Shaft VD71/72 5" X 1.375 Bore		
023559-150	NA	Coupling Shaft VD71/72 5" X 1.50 Bore		

Velvet Drive is a registered trademark of Borg Warner Corporation

**SEE COUPLING SPEC SHEET NEXT PAGE.....**



### COUPLING INFORMATION

PART NUM.	DIM: A	DIM: B	DIM: C	DIM: D	DIM: E	DIM: F	DIM: G	DIM: H
023559-125	5.00"	1.250"	0.455"	3.125"	4.250"	2.435"	1.885"	0.450"
023559-137	5.00"	1.375"	0.455"	3.125"	4.250"	2.435"	1.885"	0.450"
023559-150	5.00"	1.500"	0.455"	3.125"	4.250"	2.435"	1.885"	0.450"
023543-075	4.00"	0.750"	0.392"	2.250"	3.250"	2.330"	1.845"	0.385"
023543-087	4.00"	0.875"	0.392"	2.250"	3.250"	2.330"	1.845"	0.385"
023543-100	4.00"	1.000"	0.392"	2.250"	3.250"	2.330"	1.845"	0.385"
023543-125	4.00"	1.250"	0.392"	2.250"	3.250"	2.330"	1.845"	0.385"

### APPLICATION

CPL SHAFT VD71/72

**ALTO PRODUCTS CORP.**



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SCALE: 1:2

DATE: 7/8/13