

Gas Springs



WGBenjey *Cylinders*
inc.

Formerly DE-STA-CO Cylinders

2293 Werth Road, Alpena, MI 49707
Phone: 800-942-2957 Fax: 866-942-3297
E-mail: wgb cylinders@benjey.com

INTRODUCTION

DE-STA-CO CYLINDERS, INC. HAS BEEN DESIGNING AND MANUFACTURING FLUID POWER ACTUATORS AND SPRINGS FOR OVER A QUARTER OF A CENTURY. THROUGH EXTENSIVE DESIGN, RESEARCHING AND TESTING, DE-STA-CO CYLINDERS, INC. BRINGS YOU THE ADVANCED **D.C.I. GAS SPRING** AND SYSTEM. IN VIEW OF THE STRUCTURAL AND OPERATIONAL FEATURES IN OUR NEW WE AT DE-STA-CO CYLINDERS BELIEVE WE HAVE A SUPERIOR GAS SPRING COMPARED TO OLDER STYLED AIR SPRINGS AND MECHANICAL SPRINGS.

- **SUPERIOR BEARINGS**
- **SUPERIOR SEALING**
- **SUPERIOR LUBRICATION**

RESULTING IN EXTRA LONG ZERO LEAKAGE LIFE WHILE UTILIZING RELATIVELY HIGH INTERNAL PRESSURE (2,000 P.S.I. MAXIMUM PRECHARGE). COMPARING THE GAS SPRING TO COIL SPRINGS OR AIR SPRINGS, THE GAS SPRINGS ARE RELATIVELY SMALL IN SIZE, AND YET WILL PROVIDE A MUCH HIGHER ABSORBING AND CUSHIONING FORCE. THE NEW **D.C.I. GAS SPRINGS** ARE AVAILABLE TWO WAYS.

1. PRECHARGED AT THE FACTORY AND SEALED. (CHARGING PRESSURE 100 P.S.I. TO 2,000 P.S.I. CUSTOMER TO SPECIFY).
2. SYSTEM CHARGED. (ALLOWING THE CUSTOMER TO CHARGE OR DRAIN THE SYSTEM AT WILL).

BOTH WAYS THE ADVANCED **D.C.I. GAS SPRINGS** ARE DESIGNED TO DEVELOP HIGH INITIAL TONNAGE REQUIRED IN TODAY'S DIES. THE NEED FOR EXPENSIVE MANIFOLDS IS ELIMINATED THUS SAVINGS IN DIE MANUFACTURING COST. WITH THE REDUCTION OF DOWN TIME THE SAVINGS CONTINUE ON THROUGH THE LIFE OF THE DIE. THIS IS MADE POSSIBLE THROUGH THE EXTENDED LONG LIFE OF OUR UNIQUE BEARING DESIGN AND RELIABLE ZERO LEAKAGE SEALS. THIS HAS BEEN PROVEN BY OPERATING MILLIONS OF STROKES WITH ZERO LEAKAGE.

THE **D.C.I. GAS SPRING** IS DESIGNED WITH A NEW TYPE HIGH PRESSURE CHECK AND SAFETY EXHAUST VALVE. THIS WILL ALLOW THE NEW HIGHER PRESSURE SPRINGS TO BE INSTALLED QUITE SIMILAR TO THE METHOD USED FOR PNEUMATIC SPRINGS. **D.C.I. GAS SPRINGS** ARE USED IN STRETCH DRAW, CAM RETURN AND FLOATING PUNCHES. GAS SPRINGS CAN BE USED FOR THE REPLACEMENT OF AIR SPRINGS OR COIL SPRINGS, FOR ALMOST ANY APPLICATION WHERE HIGHER ABSORBING AND CUSHIONING FORCES ARE REQUIRED.



RA SERIES

RAM SIZES 1" THRU 3" (TONNAGE SIZES: 3/4, 1-1/2, 1-3/4, 3, 5 AND 7 TONS). HEAVY DUTY GAS SPRINGS ARE OFFERED WITH THE D.C.I. CHECK AND SAFETY EXHAUST VALVE FOR SYSTEM CHARGING, OR WITH OUR OWN DESIGNED HEAVY DUTY CHECK VALVE FOR PRECHARGED SPRINGS.

TO SERIES

RAM SIZES 3/8 THRU 1-1/2 (TONNAGE SIZES: 1/8, 1/5, 5/16, 7/16, 3/4, 1-1/2 AND 1-3/4 TONS). THE TO SERIES ARE AVAILABLE ONLY AS PRECHARGED SPRINGS USING OUR OWN DESIGN HEAVY DUTY CHARGING AND CHECK VALVE. THESE SPRINGS CAN BE USED AS DROP IN SPRINGS TO REPLACE COIL SPRINGS IN MANY CASES. CHECK THE FORCE CHARTS FOR THE CORRECT SIZE.

WITH RA OR TO SERIES, LONG LIFE WITH MINIMAL DOWN TIME CAN BE EXPECTED. INTERCHANGEABLE WITH MOST OTHER GAS SPRINGS ON THE MARKET TODAY. INCH AND METRIC SIZES ARE LISTED IN THIS CATALOG IN STANDARD MOUNTINGS. MANY OTHER MOUNTS ARE AVAILABLE UPON REQUEST.

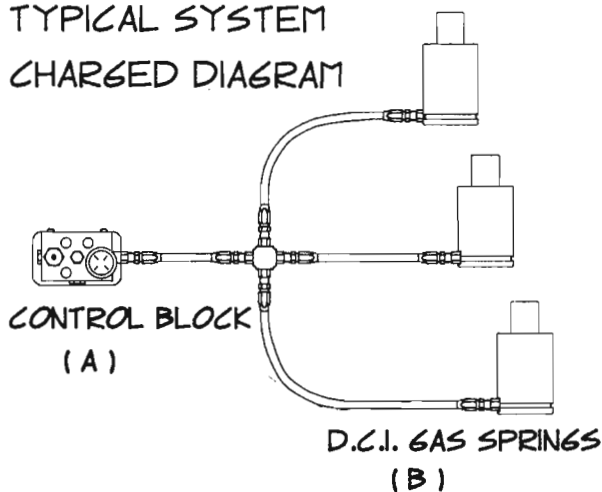
WHAT IS SYSTEM CHARGED?

SYSTEM CHARGING IS A MANUAL WAY OF CHARGING AND DISCHARGING **D.C.I. GAS SPRINGS**, (WHEN INSTALLED FOR EXAMPLE INSIDE A DIE.) THE SYSTEM IS COMPRISED OF A CONTROL BLOCK (A) CONNECTED TO **D.C.I. GAS SPRINGS** (B) WITH HIGH PRESSURE HOSE AND FITTINGS. THE CONTROL BLOCK (420-227) OR SEGMENTED BLOCK (420-230) CAN BE USED.

TO USE THE SYSTEM SIMPLY CHARGE FROM THE PRESSURE REGULATOR ON THE NITROGEN TANK THROUGH THE FILLER CHECK VALVE. WHEN THE SYSTEM IS CHARGED TO THE REQUIRED PRESSURE IT IS NOW READY TO USE. IF MORE FORCE IS REQUIRED SIMPLY CHARGE THE SYSTEM WITH MORE PRESSURE. (THE MAXIMUM PRESSURE IS 2000 P.S.I.) IF LESS FORCE IS REQUIRED JUST OPEN THE DRAIN DOWN VALVE, WHICH IN TURN WILL DRAIN THE NITROGEN SPRINGS. CLOSE THE DRAIN DOWN VALVE AND RECHARGE TO THE LOWER PRESSURE FOR LESS FORCE.

WITH THE DRAIN DOWN VALVE CLOSED AND THE SYSTEM CHARGED, THE CHARGING HOSE FROM THE NITROGEN TANK CAN BE REMOVED FROM THE FILLER CHECK VALVE. THE CHARGED PRESSURE WILL REMAIN IN THE SYSTEM. ALL CONNECTED **D.C.I. GAS SPRINGS** WILL BE CHARGED. WHEN THE GAS SPRINGS ARE OPERATED, ALL HIGHER COMPRESSED NITROGEN GAS WILL BE LOCKED WITHIN THE **D.C.I. GAS SPRINGS** BY THE CHECK AND SAFETY EXHAUST VALVE. THIS VALVE WILL REMAIN CLOSED UNTILL THE CHARGED PRESSURE IS DRAINED THROUGH THE DRAIN DOWN VALVE. AT NO TIME WILL THE PRESSURE WITHIN THE CONTROL BLOCK OR HOSES EVER RISE ABOVE THE CHARGED PRESSURE. WHEN THE DRAIN DOWN VALVE IS OPENED, THIS WILL DRAIN THE CHARGED PRESSURE FROM WITHIN THE CONTROL BLOCK AND HOSE SYSTEM, ALLOWING THE CHECK AND SAFETY EXHAUST VALVE TO SHIFT AND DRAIN PRESSURE FROM WITHIN THE GAS SPRINGS.

TYPICAL SYSTEM CHARGED DIAGRAM



DE-STA-CO Cylinders, Inc.

50625 Cherry Hill Road • Canton, Michigan 48188
1 (800) 318-3000 • (734) 495-0000 • FAX: (734) 495-0085

RA SERIES

M8 THREAD FOR HANDLING

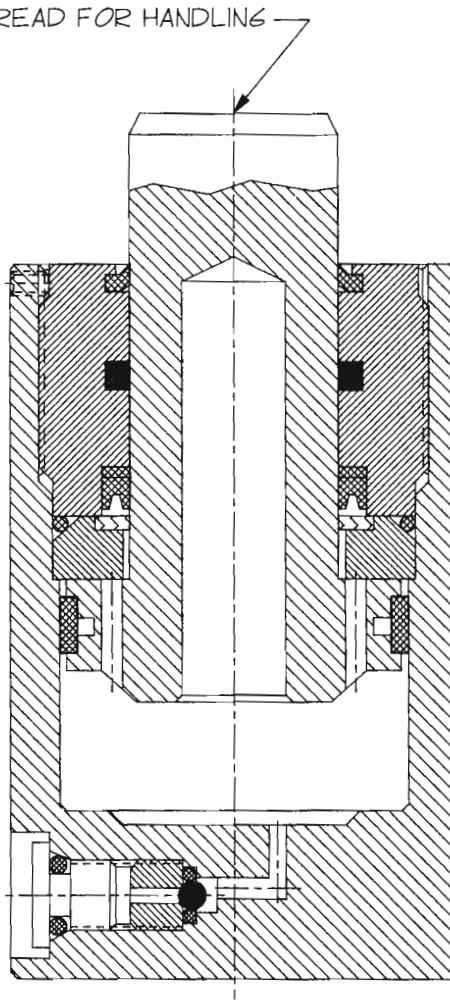
PISTON & PISTON ROD
MACHINED FROM ALLOYSTEEL
ONE PIECE CONSTRUCTION

BEARING HEAD THREADED
INTO HEAVY WALL
STEEL TUBING
MIN. SAFETY FACTOR 6 TO 1

POSITIVE PISTON STOP
AN ORIGINAL DESIGN BY D.C.I.

SELF LUBRICATING
PISTON RIDER

D.C.I. PATENTED
HIGH PRESSURE
CHECK AND SAFETY
EXHAUST VALVE



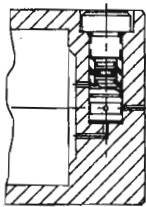
HEAVY DUTY ROD WIPER
KEEPS ROD CLEAN AND
IMPURITIES OUT

LONG BEARINGS AND
BEARING HOUSINGS ARE
DESIGNED TO PROTECT
THE ROD SEAL FOR
LONG LIFE AND ZERO
LEAKAGE

D.C.I. PISTON ROD
SEALING SYSTEM

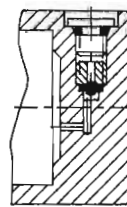
O-RING STATIC SEAL

SMOOTH BODY FOR
EASE OF DROPPING
INTO POCKETS



SYSTEM CHARGED

1/2-20 SAE PORT FOR ATTACHMENT
TO HOSE FITTINGS AND CONTROL
BLOCK OR SEGMENTED BLOCKS
VALVE ASSEMBLY NO. SC-3310



PRECHARGED

CHARGED TO CUSTOMER SPECIFIED
PRESSURE (200 TO 2000 PSI MAX)
SEALED WITH 1/2-20 HOLLOW HEX PLUG
VALVE ASSEMBLY PART NO. PC-3305

THE INNOVATED SYSTEM CHARGED GAS SPRINGS BY DE-STA-CO CYLINDERS INC. THE PATENTED VALVE WILL ALLOW SYSTEM CHARGING GAS PRESSURE TO REMAIN CONSTANT, WHEN THE GAS PRESSURE IS COMPRESSED TO A MUCH HIGHER PRESSURE WITHIN THE GAS SPRING. AND YET WILL AUTOMATICALLY DRAIN OFF ALL GAS WITHIN THE GAS SPRING WHEN THE SYSTEM IS DRAINED.



DE-STA-CO Cylinders, Inc.

50625 Cherry Hill Road • Canton, Michigan 48188
1 (800) 318-3000 • (734) 495-0000 • FAX: (734) 495-0085

ORDERING INFORMATION

SPRING SIZE

075 (3/4 TON)
 150 (1-1/2 TON)
 175 (1-3/4 TON)
 300 (3 TON)
 500 (5 TON)
 700 (7 TON)
 (INITIAL FORCE AT 2000 PSI)

(RA - SERIES)

ORDERING EXAMPLE

20 - RA-00 - 150 X 2 - SYSTEM OR 2000

QUANTITY | MODEL NO. | SPRING SIZE | STROKE (1/2 INCH OR 12.5 MM INCREMENTS) | PRECHARGE PRESSURE OR SYSTEM CHARGED (USE SYSTEM OR PRESSURE) (2000 PSI MAX)

DCI VALVE KIT

INCLUDES ALL PARTS TO REPLACE EACH VALVE ASSEMBLY

CHARGING PORT	KIT NO.
PRECHARGE	PC-3306
SYSTEM CHARGED W/SLEEVE	SC-3310
SYSTEM CHRGD W/O SLEEVE	SC-3315

DCI SEAL KIT

INCLUDES ALL SEALS AND PISTON RIDER

SPECIFY PC FOR PRECHARGE
 SC FOR SYSTEM CHARGED

SPRING SIZE KIT NO.

075	PC-075R-SK
150	PC-150R-SK
175	PC-175R-SK
300	PC-300R-SK
500	PC-500R-SK
700	PC-700R-SK

DCI REPAIR KIT

INCLUDES ALL SEALS, PISTON RIDER AND ROD BEARING

SPECIFY PC FOR PRECHARGE
 SC FOR SYSTEM CHARGED

SPRING SIZE KIT NO.

075	PC-075R-RK
150	PC-150R-RK
175	PC-175R-RK
300	PC-300R-RK
500	PC-500R-RK
700	PC-700R-RK

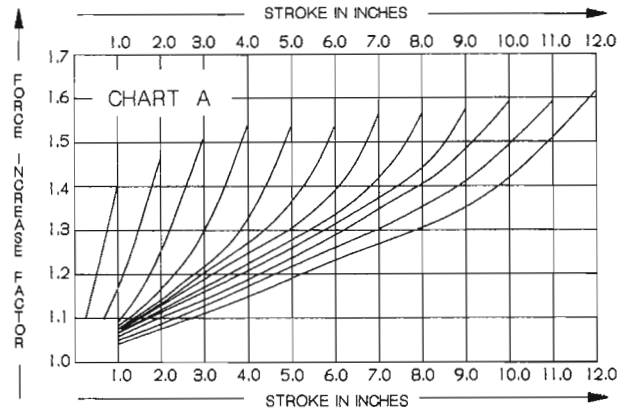
• WHEN ORDERING SPARE PARTS OR KITS ALWAYS GIVE MODEL & SERIAL NUMBER AND PRECHARGED OR SYSTEM CHARGED

DE-STA-CO CYLINDERS GAS SPRINGS ARE PROTECTED BY ONE OR MORE PATENTS

FORCE INCREASE DIAGRAM

GAS SPRING FORCE VALUES

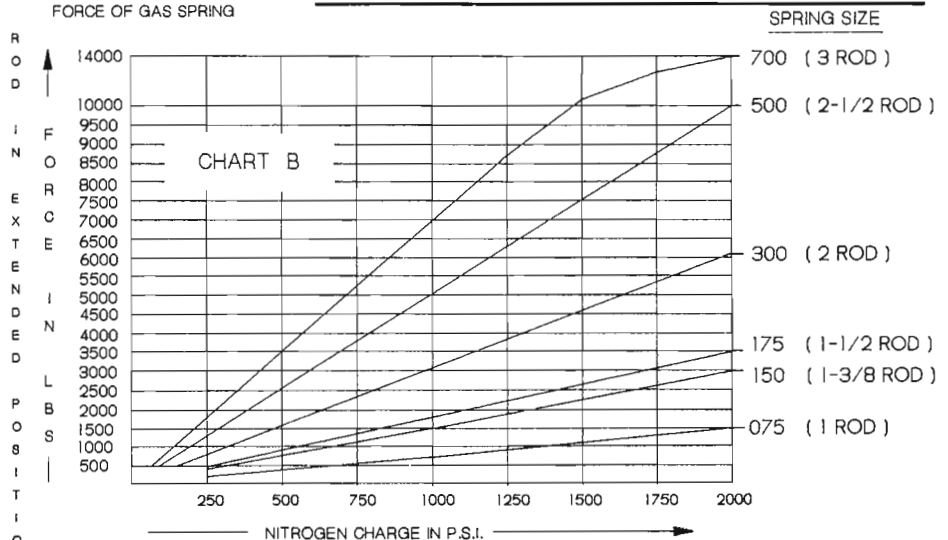
- 1) DETERMINE STROKE OF GAS SPRING
- 2) SELECT ACTUAL TRAVEL FROM CHART 'A'
- 3) READ ACROSS CHART 'A' TO FIND FORCE INCREASE FACTOR
- 4) MULTIPLY FORCE INCREASE FACTOR BY INITIAL FORCE (FROM CHART 'B') TO DETERMINE ACTUAL FORCE ON ROD



GAS SPRING INITIAL FORCE

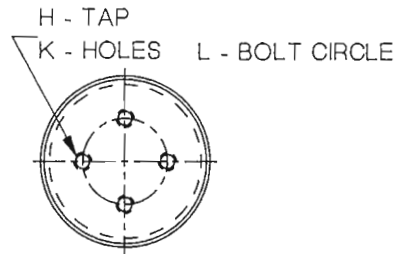
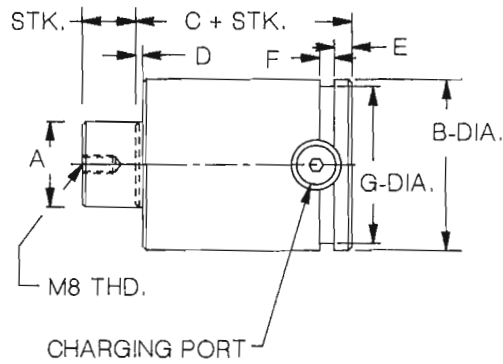
- 1) SELECT SIZE OF GAS SPRING
- 2) DETERMINE NITROGEN CHARGE (2000 PSI MAX)
- 3) READ ACROSS TO FIND INITIAL FORCE OF GAS SPRING

GAS SPRING INITIAL FORCE CHART



DE-STA-CO Cylinders, Inc.

50625 Cherry Hill Road • Canton, Michigan 48188
 1 (800) 318-3000 • (734) 495-0000 • FAX: (734) 495-0085

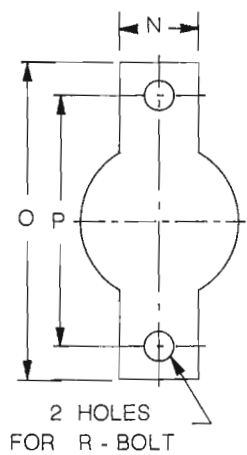
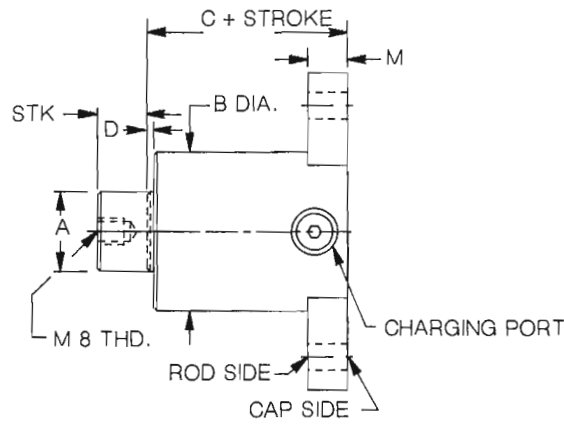


MODEL NO.(RA-00) STD MOUNT

NOTE 1
DCI GAS SPRINGS MUST BE
BACKED UP WITH RIGID BACKING
AT END OPPOSITE PISTON ROD

SIZE	A DIA.	B	C	D	E	F	G	H	K	L	M	N	O	P	R
075	1.00 25.4	1.97 50	3.75 95	.13 3.18	.315 8	.276 7	1.69 43	M 8	2	.79 20	.75 19	1.25 28.6	4.25 107.9	3.50	3/8 12
150	1.37 35	2.96 75	4.33 110	.13 3.18	.315 8	.276 7	2.68 68	M 8	4	1.57 40	.75 19	1.50 38.1	6.00 152.4	4.75	1/2 12
175	1.50 38.1	2.96 75	4.33 110	.13 3.18	.315 8	.276 7	2.68 68	M 8	4	1.57 40	.75 19	1.50 38.1	6.00 152.4	4.75	1/2 12
300	2.00 50.8	3.74 95	4.72 120	.13 3.18	.315 8	.276 7	3.43 87	M 8	4	2.36 60	.75 19	1.50 38.1	7.00 177.8	5.75	1/2 16
500	2.50 63.5	4.73 120	5.50 140	.13 3.18	.315 8	.276 7	4.41 112	M 10	4	3.15 80	1.00 25.4	1.50 38.1	7.75 196.8	6.50	5/8 16
700	3.00 76.2	5.24 133	6.00 152.4	.13 3.18	.354 9	.375 9.5	4.92 125	M 10	4	3.94 100	1.25 31.1	2.00 50.8	8.75 222	7.50	3/4 20

METRIC



IF MOUNT IS TO BE COUNTERBORED
SPECIFY ROD SIDE OR CAP SIDE

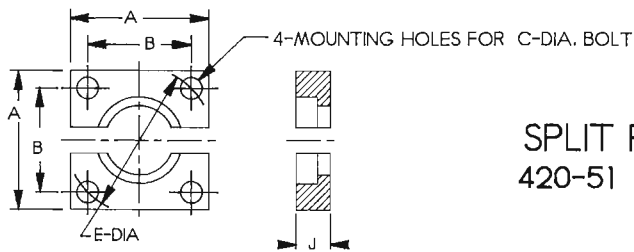
MODEL NO.(RA-01) EAR MOUNT

NOTE 1
DCI GAS SPRINGS MUST BE
BACKED UP WITH RIGID BACKING
AT END OPPOSITE PISTON ROD

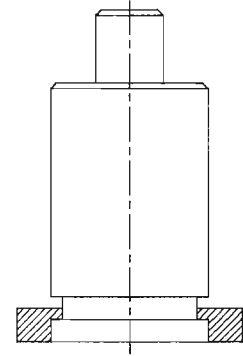


DE-STA-CO Cylinders, Inc.

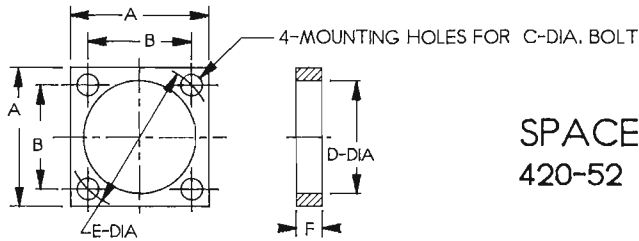
50625 Cherry Hill Road • Canton, Michigan 48188
1 (800) 318-3000 • (734) 495-0000 • FAX: (734) 495-0085



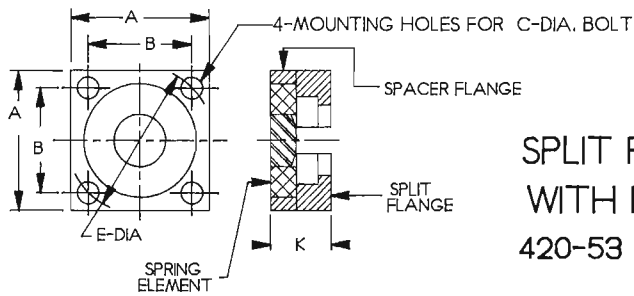
SPLIT FLANGE
420-51



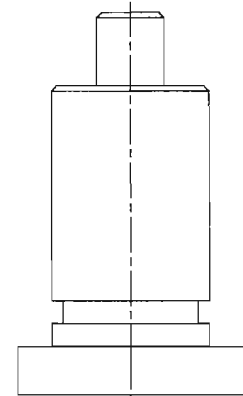
SPLIT FLANGE MOUNT



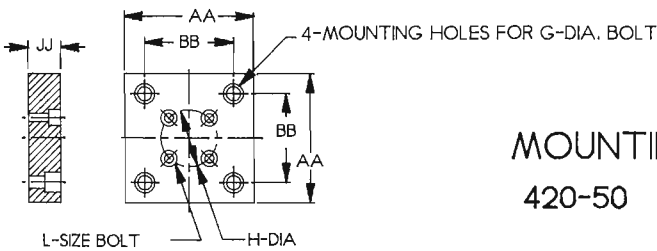
SPACER FLANGE
420-52



SPLIT FLANGE WITH FLEX
420-53



FLANGE MOUNT



MOUNTING FLANGE
420-50

SIZE	A	AA	B	BB	C	D	E	F	G	H	J	JJ	K	L
075	2.95 15	2.76 10	2.22 51	1.97 50	.51 13	2.05 52	3.15 80	.39 10	M8	.79 20	.47 12	.63 16	.87 22	M8
150	3.94 100	3.54 90	2.89 74	2.68 68	.51 13	3.03 71	4.09 104	.39 10	M10	1.57 40	.47 12	.79 20	.87 22	M8
175	3.94 100	3.54 90	2.89 74	2.68 68	.51 13	3.03 71	4.09 104	.39 10	M10	1.57 40	.47 12	.79 20	.87 22	M8
300	4.72 120	4.33 110	3.62 92	3.54 90	.71 18	3.82 91	5.12 130	.39 10	M10	2.36 60	.47 12	.79 20	.87 22	M8
500	5.51 140	4.92 125	4.31 110	3.94 100	.71 18	4.80 122	6.10 155	.75 19	M10	3.15 80	.47 12	.79 20	1.22 31	M10
700	6.30 160	5.51 140	5.01 127	4.72 120	.71 18	5.31 135	7.09 180	.75 19	M10	3.94 100	.47 12	.79 20	1.22 31	M10

METRIC

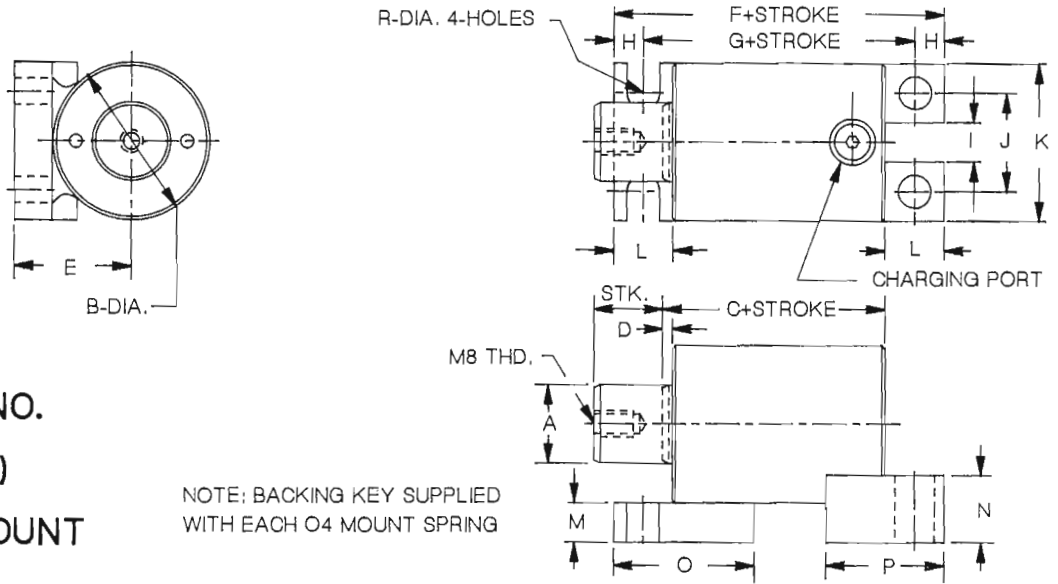
ORDER BY FLANGE NO & SPRING SIZE

EXAMPLE 420-51 - 075



DE-STA-CO Cylinders, Inc.

50625 Cherry Hill Road • Canton, Michigan 48188
1 (800) 318-3000 • (734) 495-0000 • FAX: (734) 495-0085

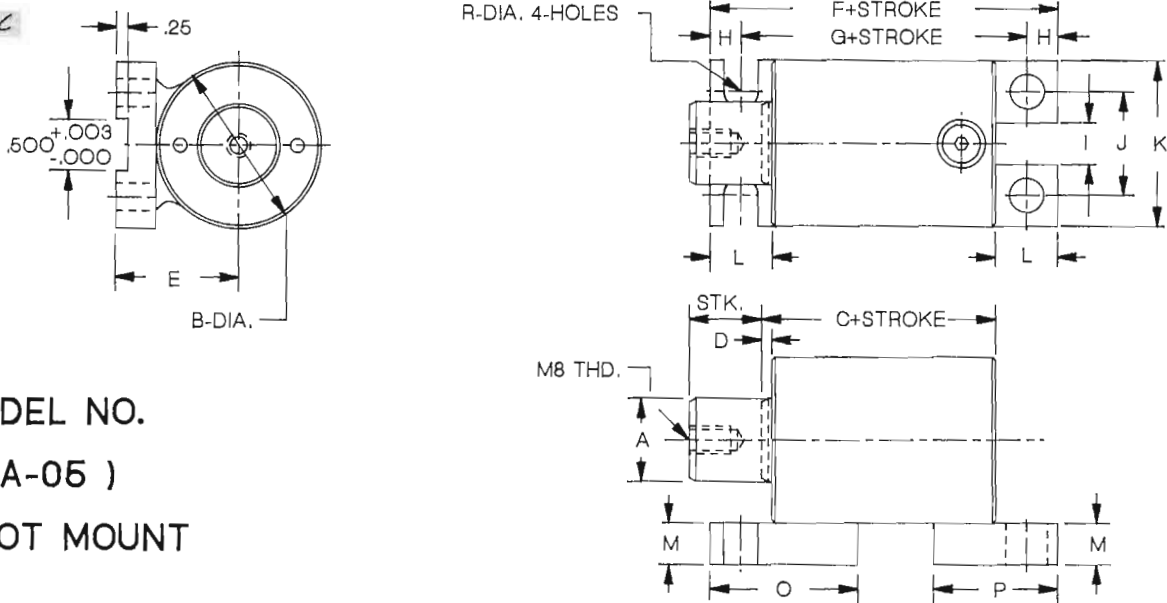


MODEL NO.
(RA-04)
FOOT MOUNT

NOTE: BACKING KEY SUPPLIED
WITH EACH O4 MOUNT SPRING

SIZE	A DIA.	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	R
075	1.00 25.4	1.97 50	3.75 95	.13 3.8	1.50 38.1	5.47 139	4.59 116.6	.44 11.1	.50 12.7	1.25 31.7	2.00 50.8	.88 22.2	.50 12.7	.75 19.1	2.50 63.5	2.00 50.8	.44 11.1
150	1.37 35	2.96 75	4.33 110	.13 3.8	2.25 57.1	6.45 163.8	5.33 135.4	.56 14.2	.75 19.1	1.88 47.7	3.00 76.2	1.13 28.6	.75 19.1	1.25 31.8	2.69 68.3	2.25 57.2	.56 14.3
175	1.50 38.1	2.96 75	4.33 110	.13 3.8	2.25 57.1	6.45 163.8	5.33 135.4	.56 14.2	.75 19.1	1.88 47.7	3.00 76.2	1.13 28.6	.75 19.1	1.25 31.8	2.69 68.3	2.25 57.2	.56 14.3
300	2.00 50.8	3.74 85	4.72 120	.06 1.6	2.63 66.8	6.9 175.3	5.78 146.8	.56 14.2	1.00 25.4	2.50 63.5	3.75 95.3	1.13 28.6	.75 19.1	1.25 31.8	2.88 73	2.25 57.2	.56 14.3
500	2.50 63.5	4.73 120	5.50 140	.13 3.8	3.13 79.5	7.68 195	6.56 166.6	.56 14.2	1.25 31.8	3.50 88.9	4.75 120.7	1.13 28.6	.75 19.1	1.25 31.8	3.00 76.2	2.38 60.3	.69 17.5
700	3.00 76.2	5.24 133	6.00 152.4	.13 3.8	3.38 85.8	8.13 206	7.0 177.8	.56 14.2	1.50 38.1	4.00 101.6	5.25 133.4	1.13 28.6	.75 19.1	1.25 31.8	3.00 76.2	2.50 63.5	.69 17.5

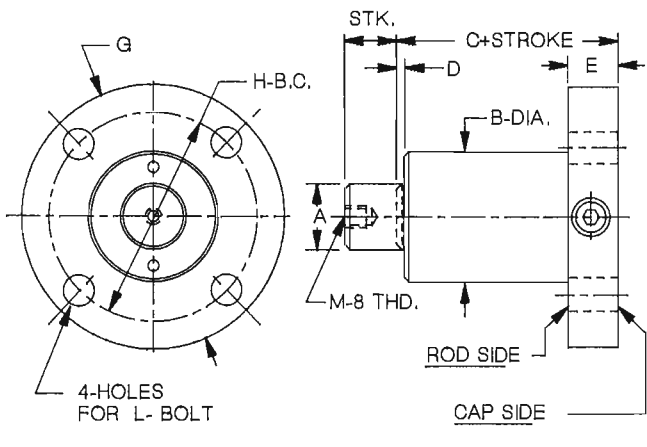
METRIC



MODEL NO.
(RA-05)
FOOT MOUNT

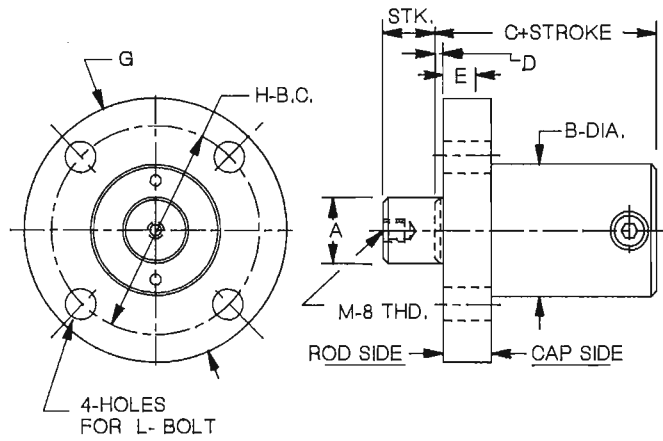


DE-STA-CO Cylinders, Inc.
50625 Cherry Hill Road • Canton, Michigan 48188
1 (800) 318-3000 • (734) 495-0000 • FAX: (734) 495-0085



**MODEL NO (RA-06)
CAP FLANGE MTD.**

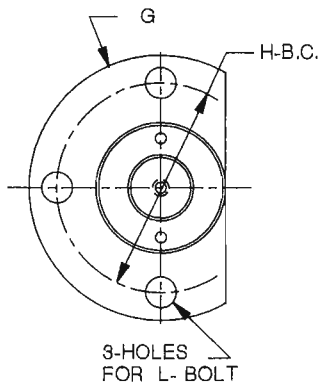
IF MOUNT IS TO BE COUNTERBORED
SPECIFY ROD SIDE OR CAP SIDE



**MODEL NO (RA-08)
ROD FLANGE MTD.**

SIZE	A DIA.	B	C	D	E	F	G	H	J	L
075	1.00 25.4	1.97 50	3.75 95	.13 3.18	1.18 30	.63 15.8	4.25 98.4	3.5 75	.44 11	3/8 M10
150	1.37 35	2.96 75	4.33 110	.13 3.18	1.18 30	.63 15.8	6.00 124	4.75 100	.56 11	1/2 M10
175	1.50 38.1	2.96 75	4.33 110	.13 3.18	1.18 30	.63 15.8	6.00 124	4.75 100	.56 11	1/2 M10
300	2.00 50.8	3.74 95	4.72 120	.06 1.6	1.18 30	.63 15.8	6.75 146	5.5 120	.56 11	1/2 M10
500	2.50 63.5	4.73 120	5.50 140	.13 3.18	1.18 30	.63 15.8	7.75 170	6.5 145	.56 11	1/2 M10
700	3.00 76.2	5.24 133	6.00 152.4	.13 3.18	1.18 30	.63 15.8	8.00 184	6.75 155	.56 11	1/2 M10

METRIC



**MODEL NO (RA-09)
FLAT SIDE FLANGE MTD.**

IF MOUNT IS TO BE COUNTERBORED
SPECIFY ROD SIDE OR CAP SIDE

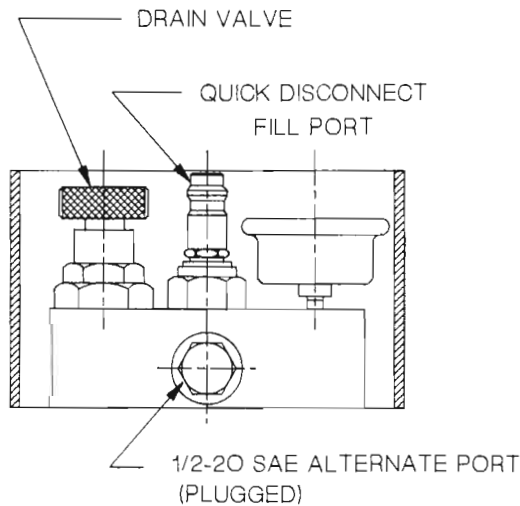
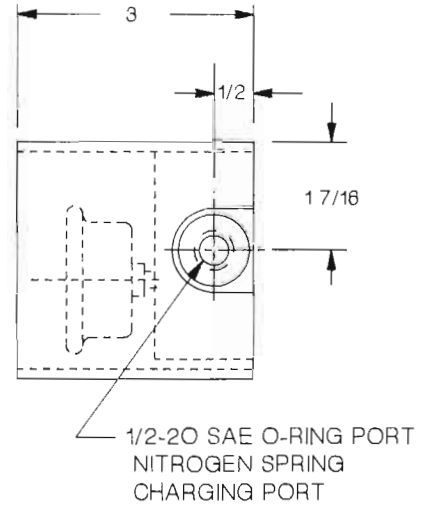
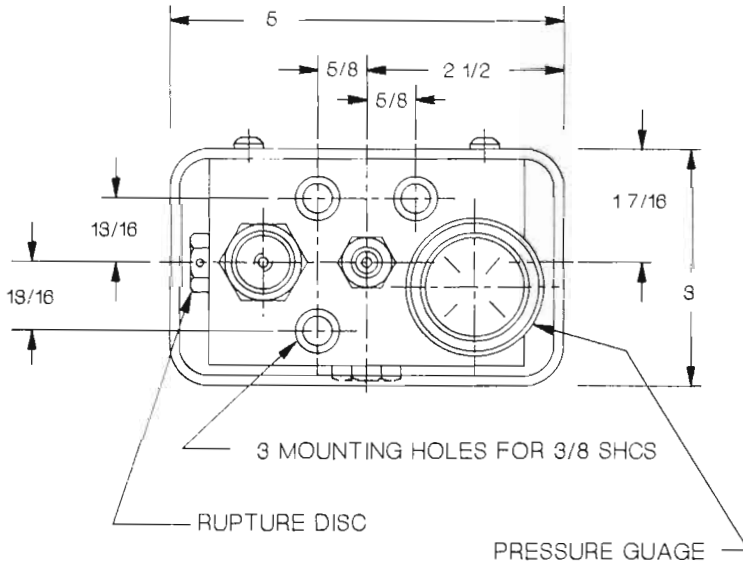


DE-STA-CO Cylinders, Inc.

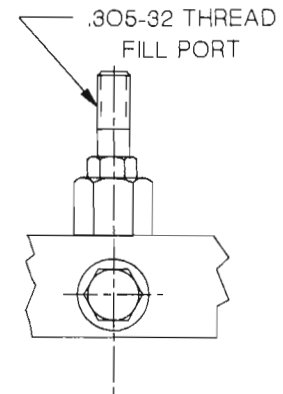
50625 Cherry Hill Road • Canton, Michigan 48188
1 (800) 318-3000 • (734) 495-0000 • FAX: (734) 495-0085

CONTROL BLOCK

(SYSTEM CHARGING)



QUICK DISCONNECT FILLER
CONTROL BLOCK
PART# 420-227



STANDARD FILLER
CONTROL BLOCK
PART# 420-220

ORDER BY PART NO
EXAMPLE 420-227



DE-STA-CO Cylinders, Inc.

50625 Cherry Hill Road • Canton, Michigan 48188
1 (800) 318-3000 • (734) 495-0000 • FAX: (734) 495-0085

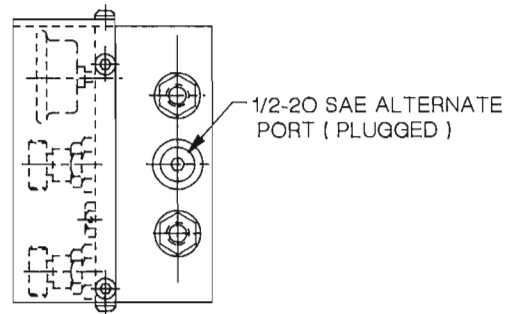
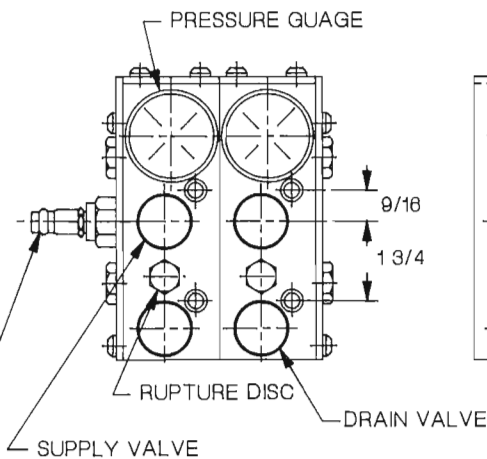
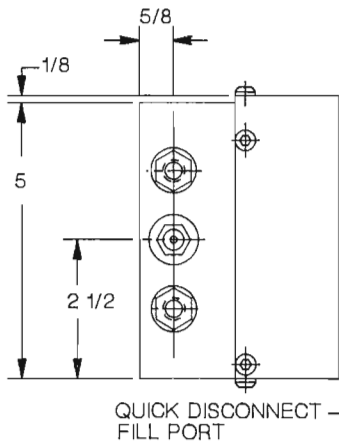
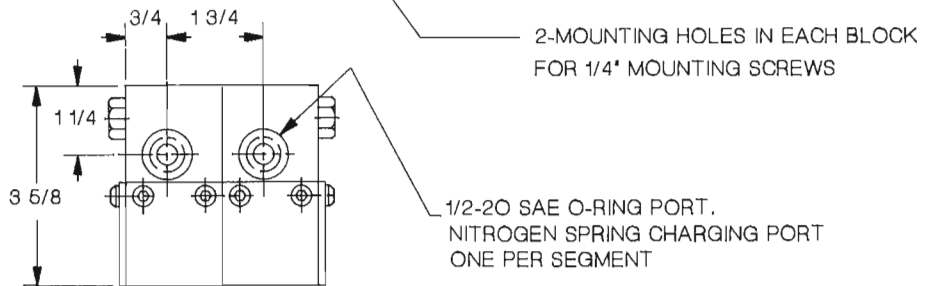
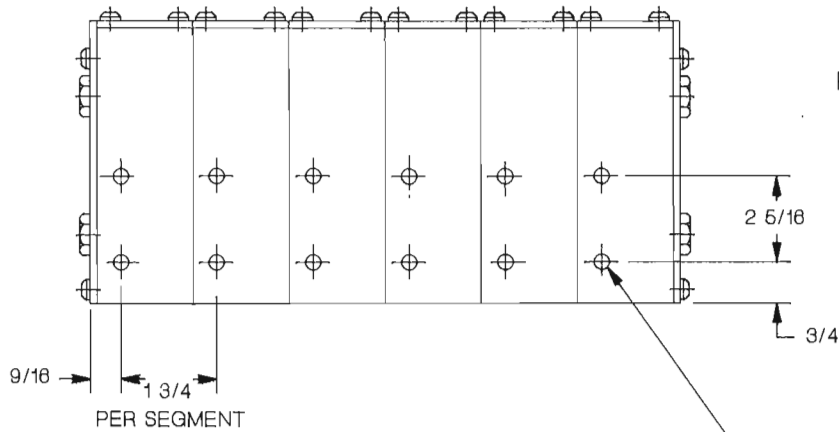
SEGMENTED CONTROL BLOCKS

(SYSTEM CHARGING)

SEGMENTED CONTROL BLOCKS

PART# 420-230

CONTROL BLOCKS MAY BE USED AS INDIVIDUAL CONTROL BLOCKS OR ASSEMBLED TOGETHER (8 BLOCKS MAX) TO OPERATE NITROGEN SPRINGS INDIVIDUALLY OR TOGETHER AS A UNIT



ORDER BY	PART NO	-	NO OF SEGMENTS
EXAMPLE	420-230	-	4

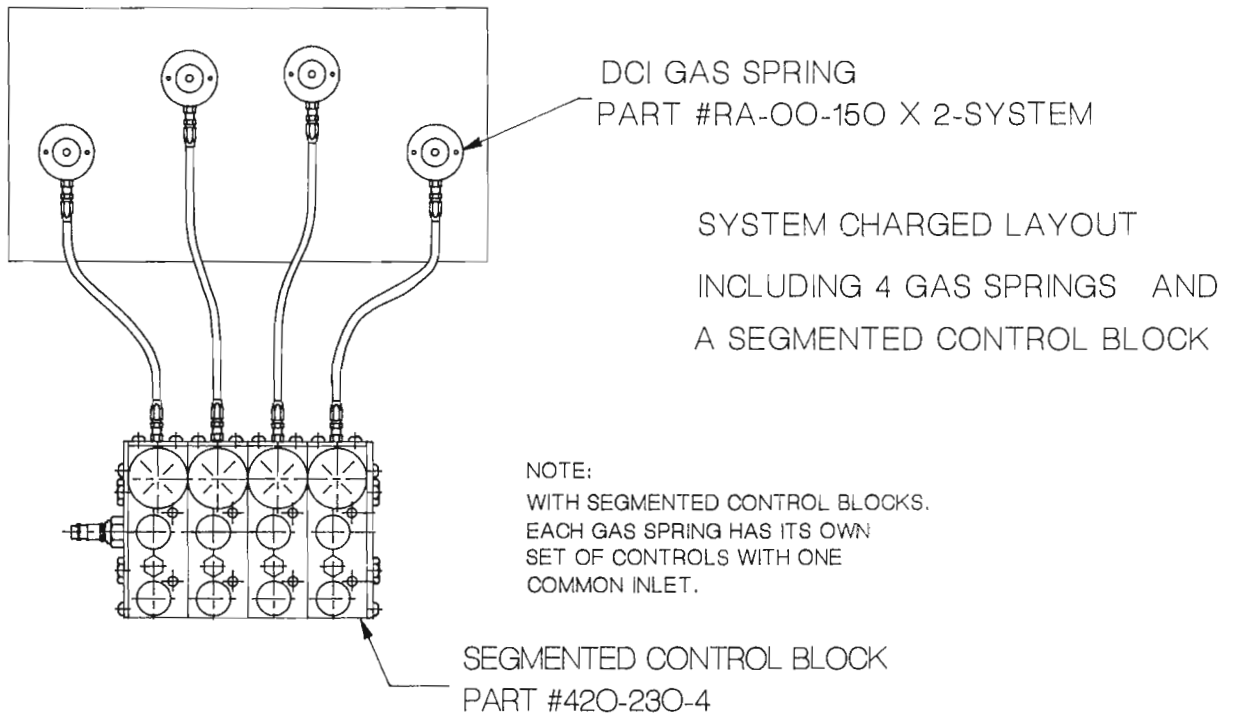
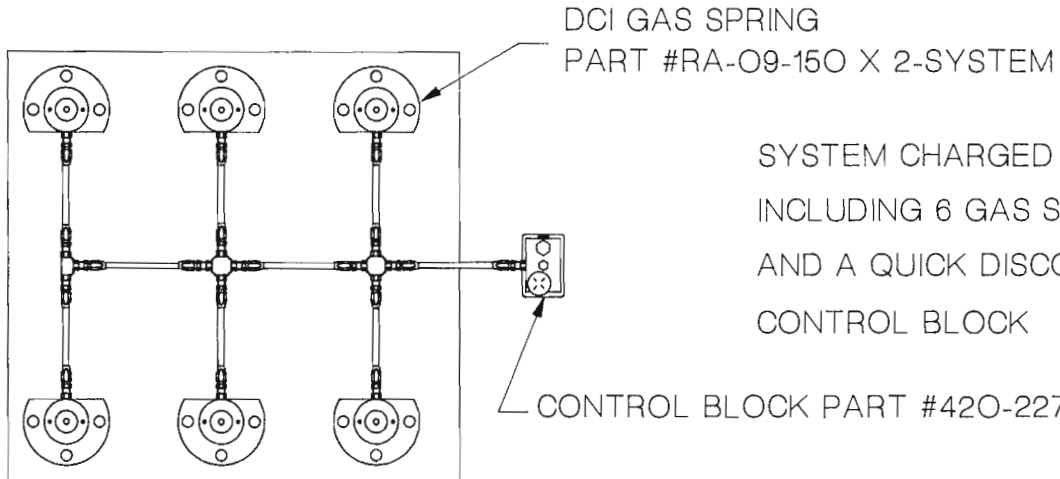


DE-STA-CO Cylinders, Inc.

50625 Cherry Hill Road • Canton, Michigan 48188
1 (800) 318-3000 • (734) 495-0000 • FAX: (734) 495-0085

PLUMBING EXAMPLES

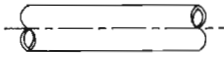
(SYSTEM CHARGING)



DE-STA-CO Cylinders, Inc.

50625 Cherry Hill Road • Canton, Michigan 48188
1 (800) 318-3000 • (734) 495-0000 • FAX: (734) 495-0085

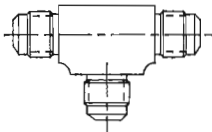
SYSTEM FITTINGS



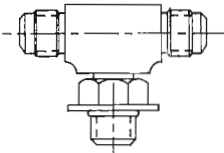
HOSE
SPECIFY LENGTH IN FEET
PART# 470-4400



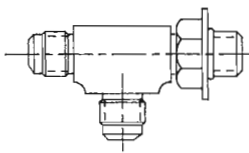
HOSE END SWIVEL
1/2-20 SAE 37°
PART# 470-4401



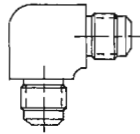
UNION TEE
1/2-20 SAE 37° FLARE
PART# 470-4402



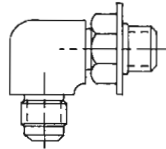
STRAIGHT THREAD BRANCH TEE
1/2-20 SAE 37° FLARE
1/2-20 O-RING
PART# 470-4403



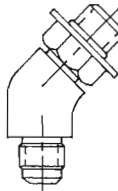
STRAIGHT THREAD RUN TEE
1/2-20 SAE 37° FLARE
1/2-20 O-RING
PART# 470-4404



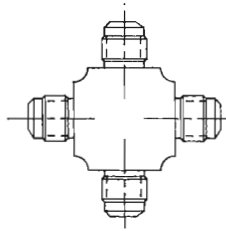
UNION ELBOW
1/2-20 SAE 37° FLARE
PART# 470-4406



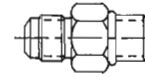
STRAIGHT THREAD 90° ELBOW
1/2-20 SAE 37° FLARE
1/2-20 O-RING
PART# 470-4407



STRAIGHT THREAD 45° ELBOW
1/2-20 SAE 37° FLARE
1/2-20 O-RING
PART# 470-4408



UNION CROSS
1/2-20 SAE 37° FLARE
PART# 470-4409



STRAIGHT THREAD CONNECTOR
1/2-20 SAE 37° FLARE
1/2-20 O-RING
PART# 470-4410



HEX HEAD PLUG
1/2-20 SAE O-RING
PART# 470-4405



HOLLOW HEX PLUG
1/2-20 SAE O-RING
PART# 470-4411



MINI HOLLOW HEX PLUG
5/16-24 SAE O-RING
PART# 470-4412



RUPTURE DISC
7/16-20 SAE O-RING
PART# RD2150

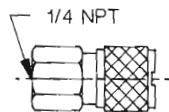
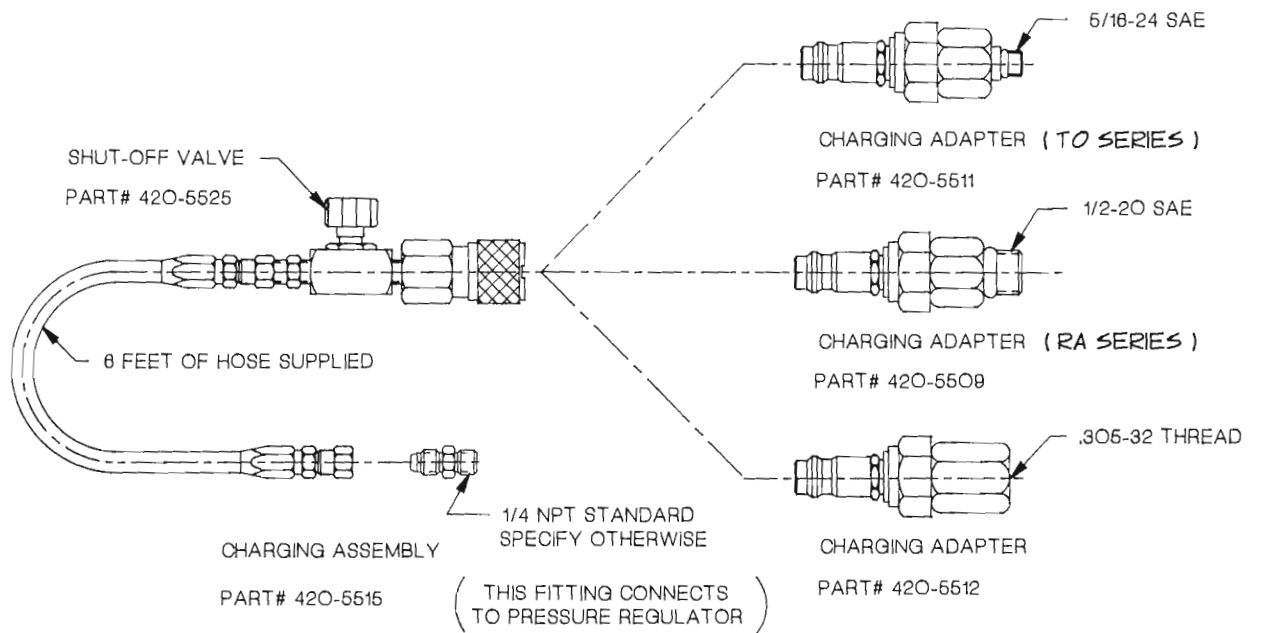
ORDER BY PART NO
EXAMPLE 470-4409



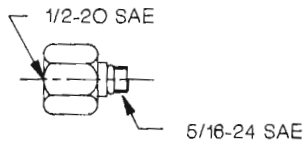
DE-STA-CO Cylinders, Inc.

50625 Cherry Hill Road • Canton, Michigan 48188
1 (800) 318-3000 • (734) 495-0000 • FAX: (734) 495-0085

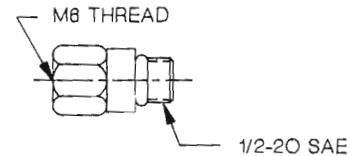
CHARGING EQUIPMENT



QUICK DISCONNECT
FEMALE ADAPTER
PART# 420-5510



CHARGING ADAPTER
PART# 420-5528
(TO SERIES)



CHARGING ADAPTER
PART# 420-5519

ORDER BY PART NO
EXAMPLE 420-5515



DE-STA-CO Cylinders, Inc.

50625 Cherry Hill Road • Canton, Michigan 48188
1 (800) 318-3000 • (734) 495-0000 • FAX: (734) 495-0085

TO SERIES

RAM SIZES 9.5, 12.6, 16, 19, 25.4, 35 AND 38 MM. OR
3/8 , 1/2 , 5/8 , 3/4 , 1 , 1-3/8 AND 1-1/2 INCH DIA.

BODY DIAMETERS 25, 28, 38, 40, 50, AND 62 MM.

THE DROP IN SPRING
REPLACEMENT

SMALL IN SIZE
LOTS OF POWER

WILL OPERATE
IN ANY POSITION

POLISHED HARD
CHROME PLATED
RODS FOR EXTRA
LONG LIFE

SMOOTH BODY
DESIGN, MACHINED
FROM STEEL BAR
STOCK, NO
WELDING



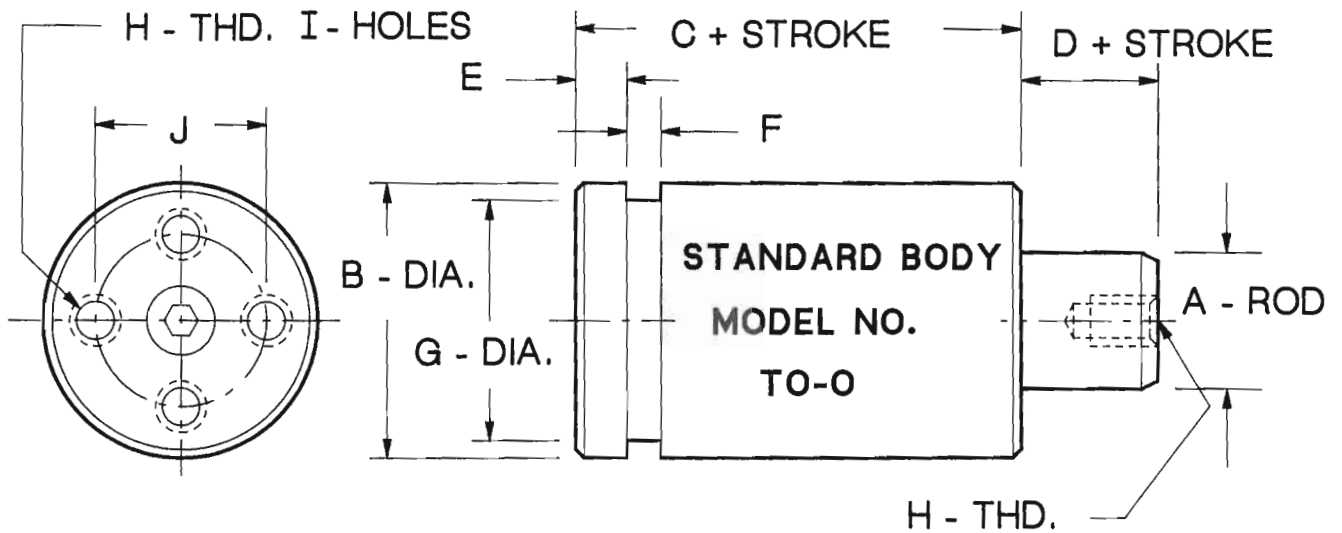
QUICK & EASY
MAINTENANCE IF
EVER REQUIRED

ALL **TO SERIES** ARE PRECHARGED SPRINGS, PRECHARGE RANGE FROM 100 TO 2000 P.S.I. CAN BE DRAINED AND CHARGED TO LOWER OR HIGHER PRESSURE BY THE CUSTOMER.

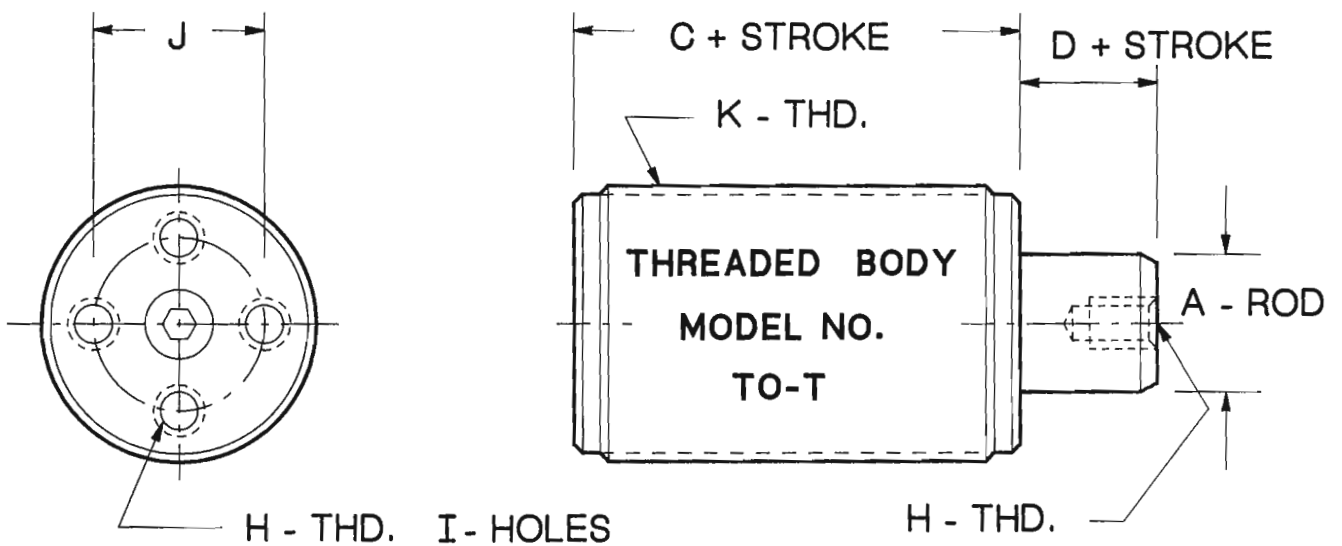


DE-STA-CO Cylinders, Inc.

50625 Cherry Hill Road • Canton, Michigan 48188
1 (800) 318-3000 • (734) 495-0000 • FAX: (734) 495-0085

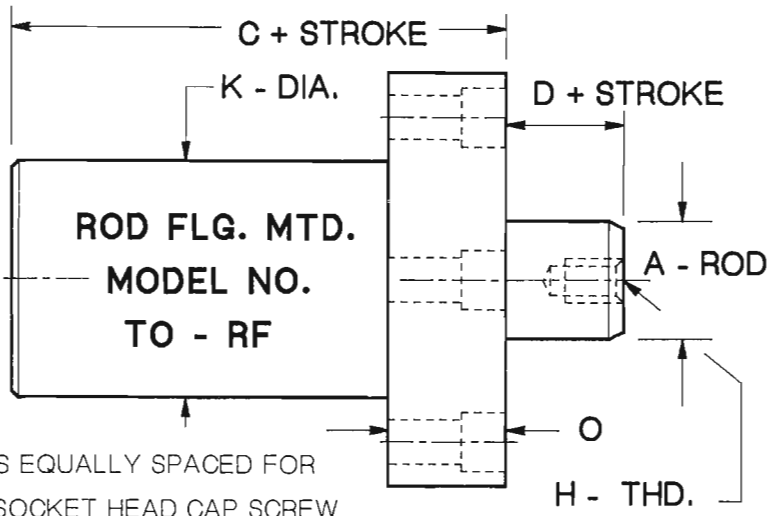
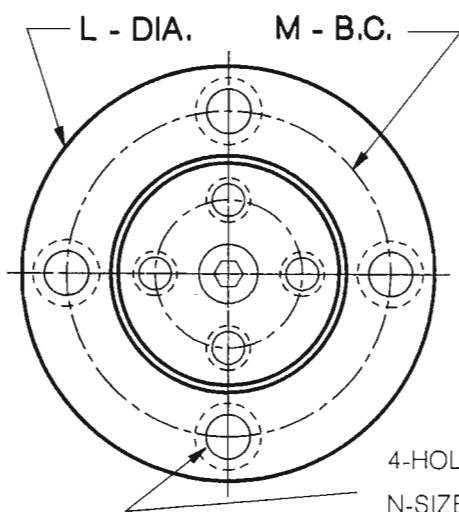


SPRING SIZE	A	B	C	D	E	F	G	H	I	J	K
012	3/8 9.5	1.06 27	2.00 51	.12 3	.15 4	.19 5	.94 24	N. A.			M30 X 1.5
020	1/2 12.6	1.18 29	2.00 51	.12 3	.15 4	.19 5	1.02 26				M34 X 1.5
031	5/8 16	1.49 38	2.00 51	.06 1.5	.31 8	.27 7	1.37 35	M 6	2	.94 24	M40 X 1.5
043	3/4 19	1.57 40	2.00 51	.06 1.5	.31 8	.27 7	1.41 36	M 6	2	1.00 25.4	M44 X 1.5
075	1 25.4	1.97 50	2.75 70	.12 3	.31 8	.27 7	1.69 43	M 8	4	1.25 32	M56 X 1.5
150	1-3/8 35	2.56 65	2.75 70	.12 3	.31 8	.27 7	2.32 59	M 8	4	1.25 32	M68 X 1.5
METRIC 175	1-1/2 38	2.56 65	2.75 70	.12 3	.31 8	.27 7	2.32 59	M 8	4	1.25 32	M68 X 1.5



DE-STA-CO Cylinders, Inc.

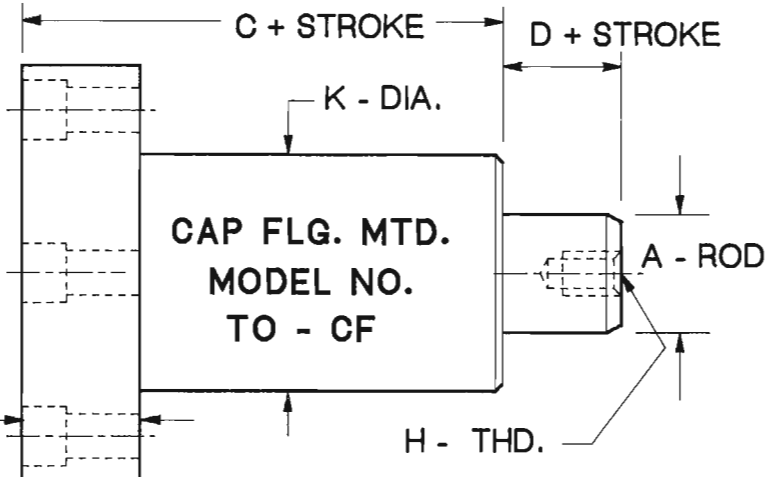
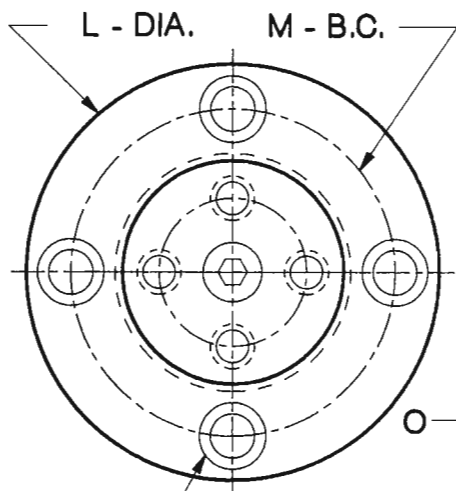
50625 Cherry Hill Road • Canton, Michigan 48188
1 (800) 318-3000 • (734) 495-0000 • FAX: (734) 495-0085



4-HOLES EQUALLY SPACED FOR N-SIZE SOCKET HEAD CAP SCREW

SPRING SIZE	A	C	D	H	K	L	M	N	O
012	3/8 9.5	2.00 51	.06 1.5	—	1.06 27	2.50 63.5	1.87 47.5	1/4	.75 19
020	1/2 12.6	2.00 51	.06 1.5	—	1.18 29	2.62 66.5	2.00 51	1/4	.75 19
031	5/8 16	2.00 51	.06 1.5	M6	1.49 38	2.87 73	2.25 57	1/4	.75 19
043	3/4 19	2.00 51	.06 1.5	M6	1.57 40	3.00 76	2.38 60	5/16	.75 19
075	1 25.4	2.75 70	.12 3	M8	1.97 50	3.50 89	2.75 70	3/8	1.00 25.4
150	1-3/8 35	2.75 70	.12 3	M8	2.56 65	4.50 114.5	3.50 89	1/2	1.00 25.4
METRIC 175	1-1/2 38	2.75 70	.12 3	M8	2.56 65	4.50 114.5	3.50 89	1/2	1.00 25.4

METRIC

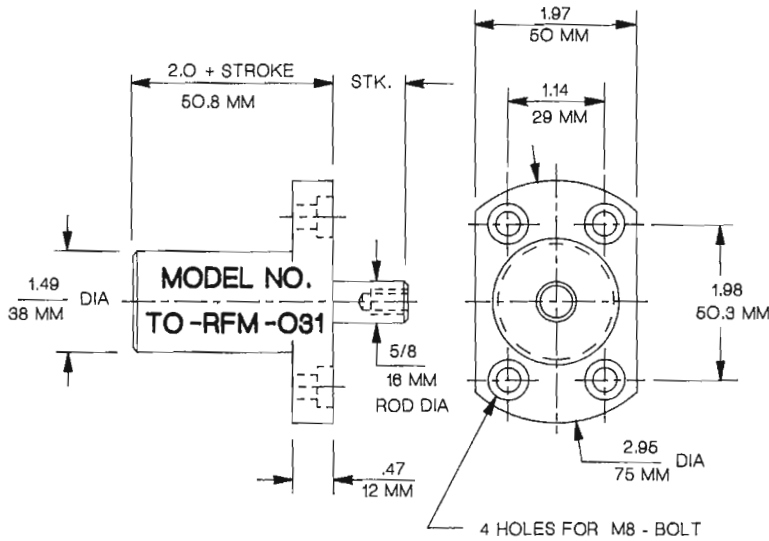


4 - HOLES EQUALLY SPACED FOR N - SIZE SOCKET HEAD CAP SCREW

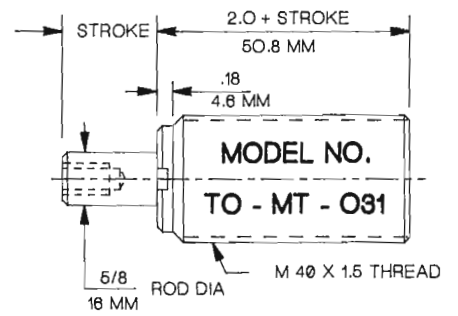


DE-STA-CO Cylinders, Inc.

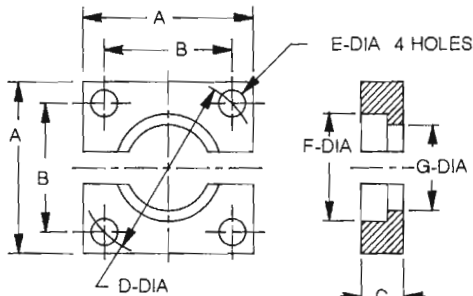
50625 Cherry Hill Road • Canton, Michigan 48188
1 (800) 318-3000 • (734) 495-0000 • FAX: (734) 495-0085



METRIC FLANGE MOUNT



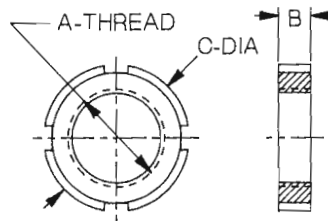
METRIC THREADED BODY



FLANGE PLATES

PART NO.	RAM DIA	A	B	C	D	E	F	G
TO-51-012	3/8 9.5	1.75 44.5	1.25 31.8	.31 7.9	1.77 44.9	.28 7.1	1.06 27	.94 24
TO-51-020	1/2 12.6	2.00 50.8	1.38 34.9	.31 7.9	1.94 49.4	.28 7.1	1.18 29	1.02 26
TO-51-031	5/8 16	2.50 63.5	1.63 41.3	.50 12.5	2.30 58.4	.34 8.1	1.49 38	1.38 35
TO-51-043	3/4 19	2.75 69.9	1.88 47.1	.50 12.5	2.65 67.3	.41 10.3	1.57 40	1.41 36
TO-51-075	1 25.4	2.95 75	2.22 57	.50 12.5	3.15 80	.51 13	2.12 54	1.85 47
TO-51-150	1-3/8 35	3.94 100	2.89 74	.50 12.5	4.09 104	.51 13	2.56 65	2.32 59
TO-51-175	1-1/2 38	3.94 100	2.89 74	.50 12.5	4.09 104	.51 13	2.56 65	2.32 59

METRIC



THREADED BODY NUTS

THREAD ONTO SPRING BODY
USED AS JAM NUTS TO LOCK
GAS SPRING INTO PLACE

PART NO.	RAM DIA	A	B	C
TO-7715-012	3/8 9.5	M30 x 1.5	.38 9.5	1.88 47.6
TO-7715-020	1/2 12.6	M34 x 1.5	.38 9.5	2.00 50.8
TO-7710-031	5/8 16	M38 x 1.5	.43 11	2.25 57
TO-7715-031	5/8 16	M40 x 1.5	.43 11	2.25 57
TO-7715-043	3/4 19	M44 x 1.5	.43 11	2.38 60
TO-7715-075	1 25.4	M56 x 1.5	.50 12.7	2.75 70
TO-7715-150	1 3/8 35	M68 x 1.5	.50 12.7	3.50 89
TO-7715-175	1 1/2 38	M68 x 1.5	.50 12.7	3.50 89



DE-STA-CO Cylinders, Inc.

50625 Cherry Hill Road • Canton, Michigan 48188
1 (800) 318-3000 • (734) 495-0000 • FAX: (734) 495-0085

ORDERING INFORMATION

SPRING SIZE

- 012 - 250 # (1/8 TON)
- 020 - 400 # (1/5 TON)
- 031 - 625 # (5/16 TON)
- 043 - 875 # (7/16 TON)
- 075 - 1500 # (3/4 TON)
- 150 - 3000 # (1-1/2 TON)
- 175 - 3500 # (1-3/4 TON)

(INITIAL FORCE AT 2000 P.S.I.)

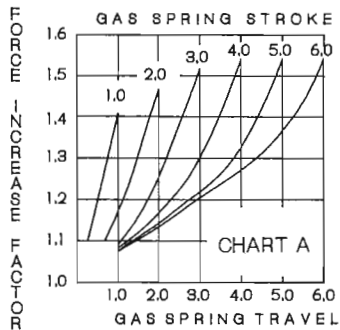
TO SERIES

ORDERING EXAMPLE

15 - TO - 0 - 012 x 2 - 2000

QUANTITY 15
 MODEL NO. TO - 0
 SPRING SIZE 012
 STROKE (1/2 INCH OR 12.5 M.M INCREMENTS)
 PRECHARGE PRESSURE 2000 PSI MAX

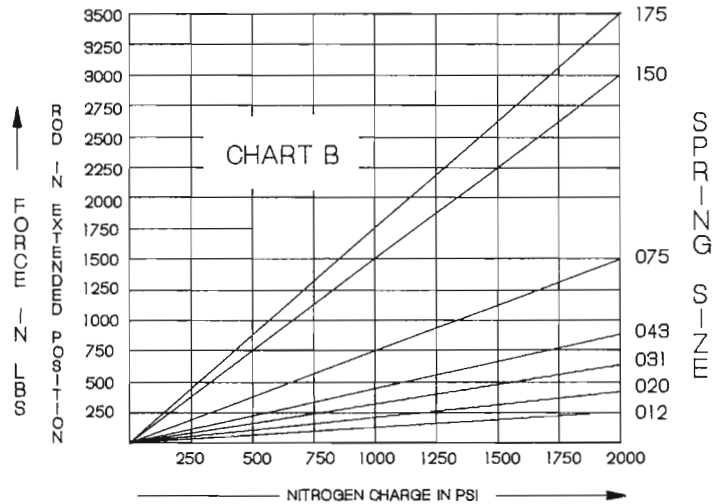
FORCE INCREASE DIAGRAM



GAS SPRING FORCE VALUES

- 1) DETERMINE STROKE OF GAS SPRING
- 2) SELECT ACTUAL TRAVEL FROM CHART 'A'
- 3) READ ACROSS CHART 'A' TO FIND FORCE INCREASE FACTOR
- 4) MULTIPLY FORCE INCREASE FACTOR BY INITIAL FORCE (FROM CHART 'B') TO DETERMINE ACTUAL FORCE ON ROD

TO-SERIES INITIAL FORCE CHART

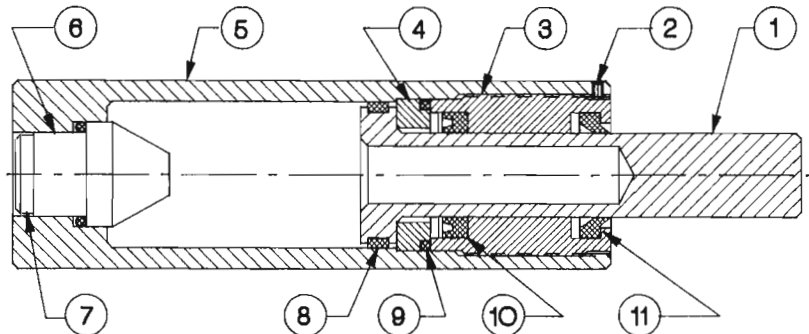


GAS SPRING INITIAL FORCE

- 1) SELECT SIZE OF GAS SPRING
- 2) DETERMINE NITROGEN CHARGE (2000 PSI MAX)
- 3) READ ACROSS TO FIND INITIAL FORCE OF GAS SPRING

PARTS LIST

- | | |
|------------------|-----------------|
| 1) PISTON ROD | 7) PLUG |
| 2) LOCK SCREW | 8) PISTON RIDER |
| 3) HEAD | 9) HEAD SEAL |
| 4) STOP RING | 10) ROD SEAL |
| 5) TUBE ASSEMBLY | 11) ROD WIPER |
| 6) VALVE SEALS | |



TO-SERIES SEAL KIT

INCLUDES PARTS:
6, 8, 9, 10, 11

SPRING SIZE	KIT NO.
012	TO-012-SK
020	TO-020-SK
031	TO-031-SK
043	TO-043-SK
075	TO-075-SK
150	TO-150-SK
175	TO-175-SK

TO-SERIES REPAIR KIT

INCLUDES PARTS:
6, 3, 8, 9, 10, 11

SPRING SIZE	KIT NO.
012	TO-012-RK
020	TO-020-RK
031	TO-031-RK
043	TO-043-RK
075	TO-075-RK
150	TO-150-RK
175	TO-175-RK



DE-STA-CO Cylinders, Inc.

50625 Cherry Hill Road • Canton, Michigan 48188
 1 (800) 318-3000 • (734) 495-0000 • FAX: (734) 495-0085

Limited Express Warranty

D.C.I. herein supplies only a **LIMITED EXPRESS WARRANTY** for all products the Company manufactures or assembles for a period of one year from the date of manufacture as follows. It will only repair or replace any parts which its inspection proves to be defective in material or workmanship occurring within twelve (12) months from its date of delivery to its original purchaser when the product has been used under conditions in which it was designed to operate. We will not accept any charges for removal, installation, assembly or any other charges in connection with replacement or repair of the product(s). No warranty is extended against corrosion, erosion or chemical attack, and the liability of the Company under this warranty for loss or damage of any nature, whether based on contract or tort, shall not exceed the purchase price of the equipment manufactured by the Company. The Company shall not be liable for any consequential, contingent, punitive or incidental damages. At our option we retain the right to have the product(s) repaired on site or returned to our manufacturing plant for our inspection, repair and testing of the units. All product(s) under warranty which are alleged to be defective are to be returned to the factory freight prepaid, to our plant. A complete explanation is required of the alleged defects and circumstances of such claimed failure.

The above supplied limited warranty is in lieu of any other warranties including any implied warranty of merchantability of fitness for a particular purpose. The Company neither assumes nor authorizes any other person to assume for it any other liability in connection with the products hereby purchased.

REPRESENTATIONS

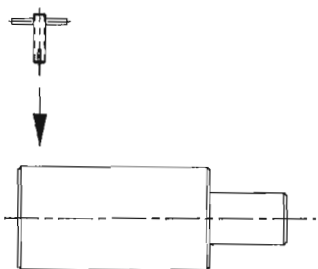
If manufacturer representatives or other persons or entities in soliciting a sale of our product have made oral or written statement about the merchandise described in this contract or the literature of the Company or its statements, such statements do not constitute warranties, shall not be relied on by the buyer, and are not part of this contract of sale. The entire contract is embodied in this writing except as to engineering details and specifications. This writing constitutes the final expression of the parties' agreement, and it is a complete and exclusive statement of the terms of that agreement.

LIMITATION OF REMEDY

The parties agree that the purchaser's sole and exclusive remedy against the seller shall be for the repair or replacement of defective parts as provided herein. The purchaser agrees that no other remedy (including, but not limited to, incidental or consequential damages for lost profits, lost sales, lost production, injury to person or property or for indemnification for loss or expense thereto, or any other incidental or consequential loss) shall be available to purchaser. The sole purpose of the stipulated exclusive remedy shall be to delimit seller's obligation to purchaser. This exclusive remedy shall not be deemed to have failed of its essential purpose so long as the seller is willing and able to repair or replace defective parts in the prescribed manner.

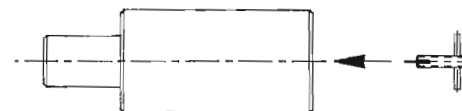
EXCLUSION OF WARRANTIES

The parties agree that the implied warranties of **MERCHANTABILITY** and **FITNESS** for a particular purpose are **EXCLUDED** from this transaction and shall not apply to the goods sold.



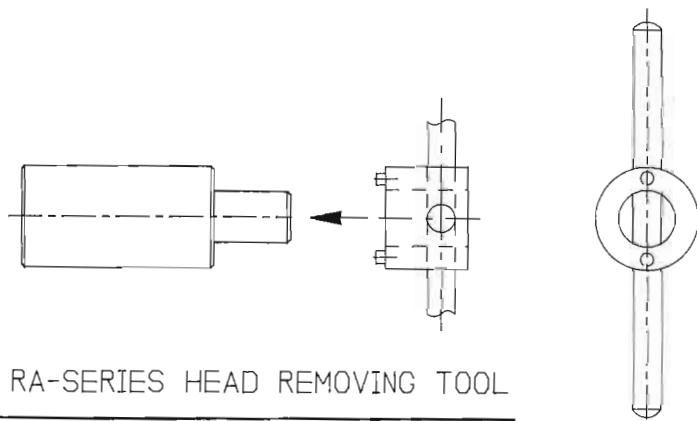
RA-SERIES DRAIN DOWN TOOL

PART NO. RA-9925



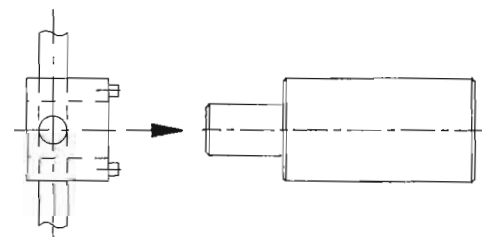
TO-SERIES DRAIN DOWN TOOL

PART NO. TO-9925



RA-SERIES HEAD REMOVING TOOL

SPRING SIZE	PART NO.
075	HRT-075-R
150	HRT-150-R
175	HRT-175-R
300	HRT-300-R
500	HRT-500-R
700	HRT-700-R



TO-SERIES HEAD REMOVING TOOL

SPRING SIZE	PART NO.
012	HRT-012-T
020	HRT-020-T
031	HRT-031-T
043	HRT-043-T
075	HRT-075-T
150	HRT-150-T
175	HRT-175-T

WGBenjey *Cylinders*

Formerly DE-STA-CO Cylinders

2293 Werth Road, Alpena, MI 49707
Phone: 800-942-2957 Fax: 866-942-3297
E-mail: wgbcylinders@benjey.com