



REPHASING CYLINDERS

DCR SERIES

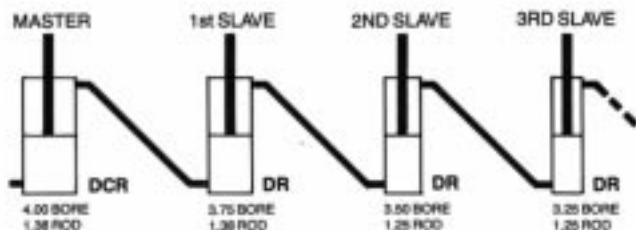


DR SERIES



DCR and DR cylinders incorporate an internal piston bypass for synchronizing (rephasing) cylinders in a series circuit. The DCR also features a hydraulic depth control with adjustment from 0" to 8" stroke for use as a master cylinder in a system with DR slave cylinders. These systems are widely used on folding tillage tool implements. All cylinders are plumbed in series as shown in the sample system. Bores and rod diameters are volumetrically matched so that all cylinder rods move equally when stroked. At the end of each stroke the system is resynchronized through the piston bypass in each cylinder.

SAMPLE SYSTEM



DCR SERIES

MODEL NUMBER	BORE DIA. (INCH)	STROKE (INCH)	CLOSED CTR LGTH (INCH)	ROD DIA. (INCH)	CLEVIS PIN DIA. (INCH)	WEIGHT (LBS)
3508DCR	3½	8	20¼	1¼	1	36
408DCR	4			1½		
508DCR	5			1½	1½	67

DR SERIES

MODEL NUMBER	BORE DIA (INCH)	STROKE (INCH)	CLOSED CTR LGTH (INCH)	ROD DIA. (INCH)	CLEVIS PIN DIA (INCH)	WEIGHT (LBS)
308DR	3	8	20¼	1¼	1	24
32508DR	3¼					27
3508DR	3½					30
37508DR	3¾					34
408DR	4			1½	1¼	37
42508DR	4¼					45
4508DR	4½			1½	1¼	52
47508DR	4¾					59
508DR	5	66				

FEATURES:

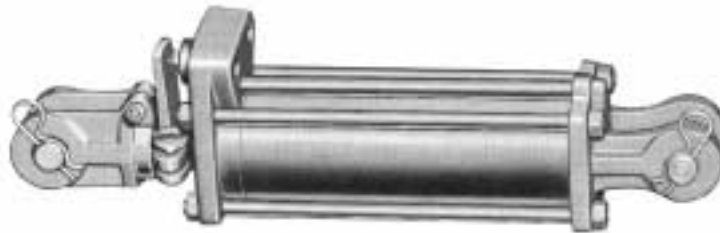
- 2500 psi work pressure (4000 psi max. shock)
- Precision skived & burnished barrel for long seal life
- Hardened and chrome plated rod
- Close tolerance head seals to prevent system contamination
- Clevis mounting
- ¾-16 SAE ports
- Top porting on DCR
- Ports in line with pins on DR



HYDRAULIC CYLINDERS

with Depth Control & Rephasing

TIE ROD CYLINDERS
DCR SERIES
Specification Sheet



The CROSS DCR series tie rod type hydraulic cylinders feature hydraulic depth control with an infinitely variable adjustment from zero to maximum stroke. An internal mechanism permits the DCR cylinder to be used as a master cylinder in a rephasing system using the DR cylinders as slave units. Long life and reliable operation are provided by the many design features plus high quality workmanship and materials.

GENERAL SPECIFICATIONS

Rated working pressure (Max. relief valve setting at full flow) 2500 psi (172 bar)
Maximum shock and surge pressure 4000 psi (276 bar)

Bore diameters	3.0	3.5	4.0	4.5	5.0	inches
	76	89	102	114	127	mm

MATERIAL SPECIFICATIONS

Cylinder barrels C1025 steel alloy
Pistons High strength aluminum alloy
Rods Induction hardened C1045 steel alloy
Base castings and rod clevises Ductile iron
Cylinder heads High tensile strength gray iron
Seals O-rings with backup on tube & rod; wear ring and teflon seal on piston

STANDARD FEATURES

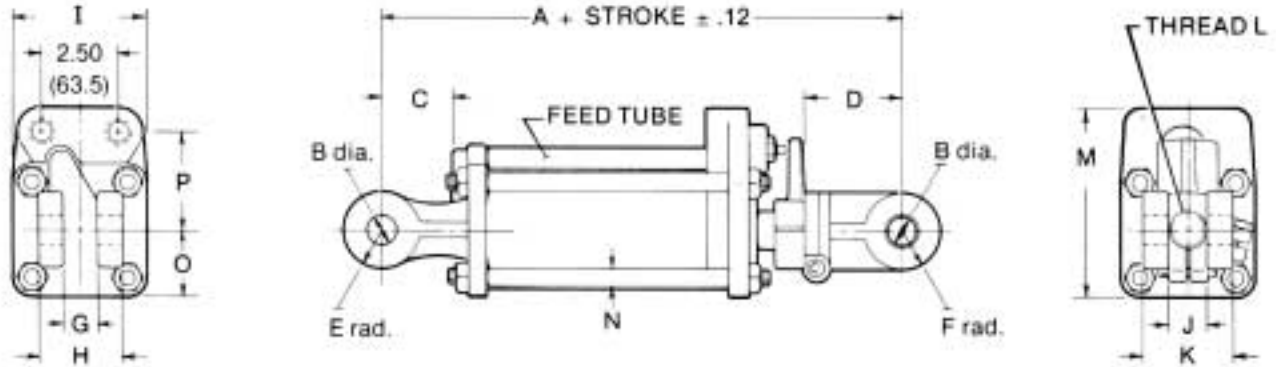
- Infinitely adjustable stroke from zero to maximum stroke
- Heavy duty rod clevis with hardened steel bushings
- Hardened steel pins
- Cylinder barrels are skived burnished precision finished to provide long seal life
- Rods are hardened, chrome plated and polished for long wear life and for protection from external damage and corrosion
- Rod wipers clean dirt and foreign matter from rod to insure long seal life
- High tensile strength tie rods with rolled threads for durability
- SAE straight thread o-ring ports (top ported)
- Standard ASAE 8" stroke

OPTIONAL FEATURES AVAILABLE

- NPTF dryseal pipe thread ports
- 1.25 diameter hardened pins (standard on 4.50 and 5.00 bore diameter cylinders) strokes to 16"



DIMENSIONAL DATA in inches and (millimeters)



ALL DIMENSIONS ARE NOMINAL

BORE DIA.	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
3.0" (76)	12.25 (305)	1.015 (25.8)	2.38 (60.4)	3.25 (82.5)	1.25 (31.8)	1.25 (31.8)	1.12 (28.4)	2.75 (69.8)	3.75 (95.2)	1.25 (31.8)	2.75 (69.8)	1 1/4 -12	5.88 (149.4)	.50 (12.7)	1.88 (47.8)	3.25 (82.6)
3.5" (89)	12.25 (305)	1.015 (25.8)	2.38 (60.4)	3.25 (82.5)	1.25 (31.8)	1.25 (31.8)	1.12 (28.4)	2.75 (69.8)	4.25 (108)	1.25 (31.8)	2.75 (69.8)	1 1/4 -12	6.12 (155.4)	.56 (14.2)	2.12 (53.8)	3.25 (82.6)
4.0" (102)	12.25 (305)	1.015 (25.8)	2.38 (60.4)	3.25 (82.5)	1.25 (31.8)	1.25 (31.8)	1.12 (28.4)	2.75 (69.8)	5.00 (127)	1.25 (31.8)	2.75 (69.8)	1 1/4 -12	6.69 (169.9)	.62 (15.7)	2.50 (63.5)	3.44 (87.4)
4.5" (114)	12.25 (305)	1.265 (32.1)	2.28 (57.9)	3.25 (82.5)	1.38 (35.0)	1.25 (31.8)	1.09 (27.7)	3.12 (79.2)	5.75 (146)	1.25 (31.8)	2.75 (69.8)	1 1/2 -12	7.24 (183.9)	.75 (19.0)	2.88 (73.2)	3.54 (89.9)
5.0" (127)	12.25 (305)	1.265 (32.1)	2.35 (59.7)	3.25 (82.5)	1.41 (35.8)	1.25 (31.8)	1.34 (34.0)	3.50 (88.9)	6.00 (152.4)	1.25 (31.8)	2.75 (69.8)	1 1/2 -12	7.26 (184.4)	.75 (19.0)	3.00 (76.2)	3.38 (85.9)

ORDERING INFORMATION

SERIES	BORE DIA. (in. x 100)	STROKES (in. x 100)	ROD DIA. (in. x 100)	PORT SIZE & Type
DCR	300	800	125	D * 1/2-16 SAE E 7/8-14 SAE R 1/2 NPTF
	350	800	125	
	400	800	138	
	450	800	150	
	500	800	150	

*Standard



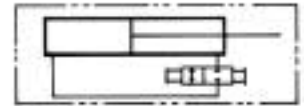
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100 Factory Street
Lewis, Kansas 67552
Phone 620/324-5525 fax -5737



HYDRAULIC CYLINDERS

with Rephasing

TIE ROD CYLINDERS
DR SERIES
Specification Sheet



The CROSS series DR tie rod type cylinders provide long life and reliable operation due to high quality materials and workmanship. These cylinders incorporate an internal mechanism for automatic rephasing (synchronizing) in a series circuit. The DR cylinders may be used as master or slave units or as slave units with DCR cylinders with hydraulic depth control.

GENERAL SPECIFICATIONS

Rated system pressure (max. relief valve setting at full flow) 2500 psi (172 bar)
 Differential pressure 2500 psi (172 bar)
 Maximum shock and surge pressure 4000 psi (276 bar)

Bore diameters	3.00	3.25	3.50	3.75	4.00	4.25	4.50	4.75	5.00	inches
	76	83	89	95	102	108	114	121	127	mm

MATERIAL SPECIFICATIONS

Cylinder barrels C1025 steel alloy
 Pistons High strength aluminum alloy
 Rods Induction hardened C1045 steel alloy
 Base castings and rod clevises Ductile iron
 Cylinder heads High tensile strength gray iron
 Seals o-ring with backup on tube and rod; wear ring and teflon seal on piston

STANDARD FEATURES

- Rephasing at end of extend stroke
- Hardened steel pins and heavy duty rod clevis with bushings
- Cylinder barrels are skived burnished precision finished to provide long seal life
- Rods are hardened, chrome plated and polished for long wear life and for protection from external damage and corrosion
- Rod wipers clean dirt and foreign matter from rod to insure long seal life
- High tensile strength tie rods with rolled threads for durability
- SAE straight thread o-ring ports in line with pins
- Double ported base allows optional connections to be made 90° to pins
- Standard ASAE 8" stroke

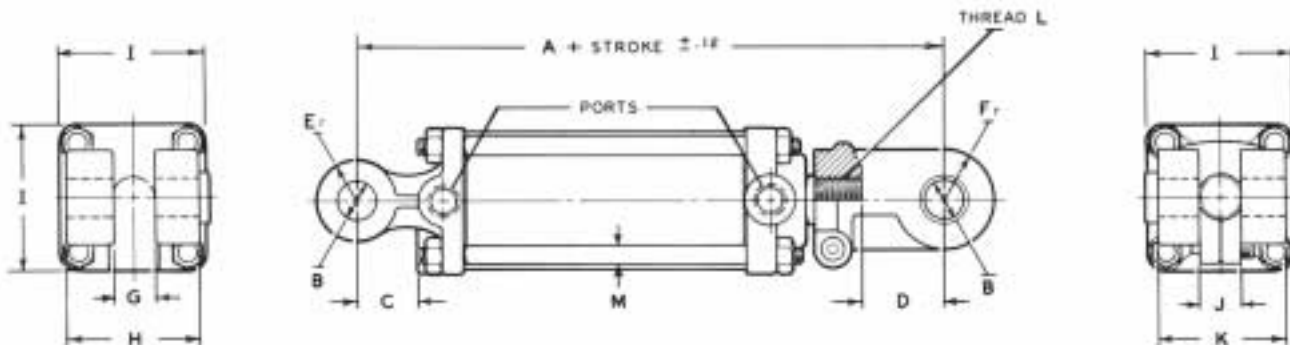
OPTIONAL FEATURES AVAILABLE

- NPTF dryseal pipe thread ports
- Strokes to 16"
- Rephasing at end of retract stroke

* Subject to compressive load limits on cylinder rod. Contact CROSS Engineering Department.



DIMENSIONAL DATA in inches and (millimeters)



ALL DIMENSIONS ARE NOMINAL

BORE DIA.	A	B	C	D	Er.	Fr.	G	H	I	J	K	L -12UNF	M
3.00 (76)	20.25 (514.4)	1.015 (25.8)	1.625 (41.3)	2.125 (54.0)	1.000 (25.4)	1.250 (31.8)	1.125 (28.6)	2.625 (66.7)	3.750 (95.3)	1.250 (28.6)	2.750 (69.8)	1 1/4	.500 (12.7)
3.25 (83)	20.25 (514.4)	1.015 (25.8)	1.625 (41.3)	2.125 (54.0)	1.000 (25.4)	1.250 (31.8)	1.250 (31.8)	2.750 (69.8)	4.250 (108.0)	1.250 (28.6)	2.750 (69.8)	1 1/4	.562 (14.3)
3.50 (89)	20.25 (514.4)	1.015 (25.8)	1.625 (41.3)	2.125 (54.0)	1.000 (25.4)	1.250 (31.8)	1.250 (31.8)	2.750 (69.8)	4.250 (108.0)	1.250 (28.6)	2.750 (69.8)	1 1/4	.562 (14.3)
3.75 (95)	20.25 (514.4)	1.015 (25.8)	2.000 (50.8)	2.125 (54.0)	1.125 (28.6)	1.250 (31.8)	1.250 (31.8)	2.875 (73.0)	5.000 (127.0)	1.250 (28.6)	2.750 (69.8)	1 1/4	.625 (15.9)
4.00 (102)	20.25 (514.4)	1.015 (25.8)	2.000 (50.8)	2.125 (54.0)	1.125 (28.6)	1.250 (31.8)	1.250 (31.8)	2.875 (73.0)	5.000 (127.0)	1.250 (28.6)	2.750 (69.8)	1 1/4	.625 (15.9)
4.25 (108)	20.25 (514.4)	1.265*	2.000 (50.8)	2.125 (54.0)	1.375 (34.9)	1.250 (31.8)	1.250 (31.8)	3.125 (79.4)	5.500 (139.7)	1.250 (28.6)	2.750 (69.8)	1 1/4	.750 (19.0)
4.50 (114)	20.25 (514.4)	1.265*	2.000 (50.8)	2.125 (54.0)	1.375 (34.9)	1.250 (31.8)	1.250 (31.8)	3.125 (79.4)	5.500 (139.7)	1.250 (28.6)	2.750 (69.8)	1 1/2	.750 (19.0)
4.75 (121)	20.25 (514.4)	1.265*	2.312 (58.7)	2.125 (54.0)	1.500 (38.1)	1.250 (31.8)	1.375 (34.9)	3.500 (88.9)	6.000 (152.4)	1.250 (28.6)	2.750 (69.8)	1 1/2	.750 (19.0)
5.00 (127)	20.25 (514.4)	1.265*	2.312 (58.7)	2.125 (54.0)	1.500 (38.1)	1.250 (31.8)	1.375 (34.9)	3.500 (88.9)	6.000 (152.4)	1.250 (28.6)	2.750 (69.8)	1 1/2	.750 (19.0)

*1.015 optional. Must be specified on order.

ORDERING INFORMATION

SERIES	BORE DIA. (inches x 100)	STROKE (inches x 100)	ROD DIAMETER (inches x 100)	PORT SIZE & TYPE
DR	300, 325, 350	800	125	**D — 1/4-16 SAE
	375, 400, 425	800	138	E — 1/2-14 SAE
	450, 475, 500	800	150	R — 1/2 NPTF

**Standard



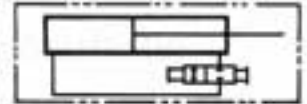
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HYDRAULIC CYLINDERS

with Rephasing

TIE ROD CYLINDERS
DP SERIES
Specification Sheet



The CROSS DP cylinders are designed for a series circuit commonly used on folding tillage equipment. The volume of oil in the rod end of the largest cylinder is closely matched to the volume in the base end of the second cylinder. This principle is used throughout the series of cylinders. The DP cylinders incorporate an internal mechanism, a small (externally protected) hole in the tube wall, that allows resynchronization at the end of the stroke by allowing fluid to bypass the piston to the next cylinder.

GENERAL SPECIFICATIONS

Rated system pressure (max. relief valve setting at full flow)* 2500 psi (172 bar)
 Differential pressure 2500 psi (172 bar)
 Maximum shock and surge pressure 4000 psi (276 bar)

Bore diameters.....	3.00	3.25	3.50	3.75	4.00	4.25	4.50	4.75	5.00	inches
	76	83	89	95	102	108	114	121	127	mm

MATERIAL SPECIFICATIONS

Cylinder tube ST52.3 alloy
 Pistons High strength aluminum alloy
 Rods Induction hardened C1045 steel alloy
 Base castings and rod clevises Ductile iron
 Cylinder heads High tensile strength gray iron
 Seals o-ring with backup on tube; wear ring and teflon seal on piston;
 Double lipped polyurethane u-cup rod seal

STANDARD FEATURES

- Rephasing at end of extend stroke
- Hardened steel pins and heavy duty rod clevis with bushings
- Cylinder tubes are skived burnished precision finished to provide long seal life
- Rods are hardened, chrome plated and polished for long wear life and for protection from external damage and corrosion
- Rod wipers clean dirt and foreign matter from rod to insure long seal life
- High tensile strength tie rods with rolled threads for durability
- SAE straight thread o-ring ports in line with pins
- Double ported base allows optional connections to be made 90° to pins
- Standard ASAE 8" stroke

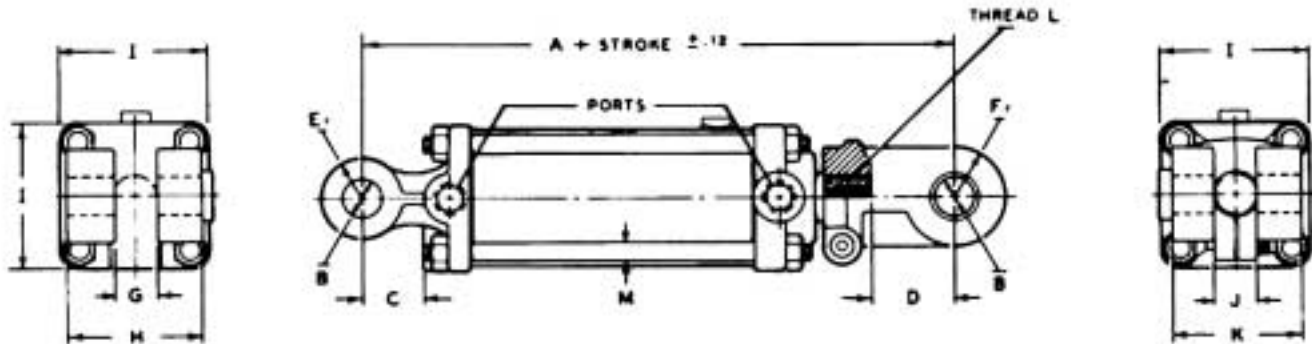
OPTIONAL FEATURES AVAILABLE

- NPTF dryseal pipe thread ports
- Strokes to 16"
- Rephasing at end of retract stroke

*Subject to compressive load limits on cylinder rod. Contact CROSS Engineering Department.



DIMENSIONAL DATA in inches and (millimeters)



ALL DIMENSIONS ARE NOMINAL

BORE DIA	A**	B	C	D	Er.	Fr.	G	H	I	J	K	L -12UNF	M
3 00 (76)	12 25 (311 2)	1 015 (25 8)	1 625 (41 3)	2 125 (54 0)	1 000 (25 4)	1 250 (31 8)	1 125 (28 6)	2 625 (66 7)	3 750 (95 3)	1 250 (31 8)	2 750 (69 8)	1 1/4	500 (12 7)
3 25 (83)	12 25 (311 2)	1 015 (25 8)	1 625 (41 3)	2 125 (54 0)	1 000 (25 4)	1 250 (31 8)	1 250 (31 8)	2 750 (69 8)	4 250 (108 0)	1 250 (31 8)	2 750 (69 8)	1 1/4	562 (14 3)
3 50 (89)	12 25 (311 2)	1 015 (25 8)	1 625 (41 3)	2 125 (54 0)	1 000 (25 4)	1 250 (31 8)	1 250 (31 8)	2 750 (69 8)	4 250 (108 0)	1 250 (31 8)	2 750 (69 8)	1 1/4	562 (14 3)
3 75 (95)	12 25 (311 2)	1 015 (25 8)	2 000 (50 8)	2 125 (54 0)	1 125 (28 6)	1 250 (31 8)	1 250 (31 8)	2 875 (73 0)	5 000 (127 0)	1 250 (31 8)	2 750 (69 8)	1 1/4	625 (15 9)
4 00 (102)	12 25 (311 2)	1 015 (25 8)	2 000 (50 8)	2 125 (54 0)	1 125 (28 6)	1 250 (31 8)	1 250 (31 8)	2 875 (73 0)	5 000 (127 0)	1 250 (31 8)	2 750 (69 8)	1 1/4	625 (15 9)
4 25 (108)	12 25 (311 2)	1.265*	2 000 (50 8)	2 125 (54 0)	1 375 (34 9)	1 250 (31 8)	1 250 (31 8)	3 125 (79 4)	5 500 (139 7)	1 250 (31 8)	2 750 (69 8)	1 1/4	750 (19 0)
4 50 (114)	12 25 (311 2)	1.265*	2 000 (50 8)	2 125 (54 0)	1 375 (34 9)	1 250 (31 8)	1 250 (31 8)	3 125 (79 4)	5 500 (139 7)	1 250 (31 8)	2 750 (69 8)	1 1/2	750 (19 0)
4 75 (121)	12 25 (311 2)	1.265*	2 312 (58 7)	2 125 (54 0)	1 500 (38 1)	1 250 (31 8)	1 375 (34 9)	3 500 (88 9)	6 000 (152 4)	1 250 (31 8)	2 750 (69 8)	1 1/2	750 (19 0)
5 00 (127)	12 25 (311 2)	1.265*	2 312 (58 7)	2 125 (54 0)	1 500 (38 1)	1 250 (31 8)	1 375 (34 9)	3 500 (88 9)	6 000 (152 4)	1 250 (31 8)	2 750 (69 8)	1 1/2	750 (19 0)

*1 015 optional. Must be specified on order.

** REPRESENTATIVE FOR 8" STROKE

ORDERING INFORMATION For SAMPLE SYSTEM see CROSS Full Line Catalog page 9.

SERIES	BORE DIA. (inches x 100)	STROKE (inches x 100)	ROD DIAMETER (inches x 100)	PORT SIZE & TYPE
DP	300, 325, 350	800	125	**D — 1/4-16 SAE
	375, 400, 425	800	138	E — 1/4-14 SAE
	450, 475, 500	800	150	R — 1/2 NPTF

**Standard



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