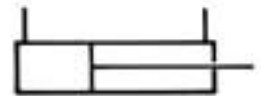




HYDRAULIC CYLINDERS

TIE ROD CYLINDERS
DB SERIES
Specification Sheet



The CROSS series DB tie rod type cylinders provide long life and reliable operation due to high quality materials and workmanship plus the many design features included in this cylinder design. An infinite number of stroke sizes are available as well as many standard and optional features.

GENERAL SPECIFICATIONS

Rated working pressure (max. relief valve setting at full flow) 2500 psi (172 bar)
(See pin recommendations page 3)

Maximum shock and surge pressure 4000 psi (276 bar)

Bore diameters

| | | | | | | |
|------|------|------|------|------|------|--------|
| 2.00 | 2.50 | 3.00 | 3.50 | 4.00 | 5.00 | inches |
| 51 | 64 | 76 | 89 | 102 | 127 | mm |

MATERIAL SPECIFICATIONS

Cylinder barrels ST52.3 steel alloy

Pistons High tensile strength gray iron or aluminum alloy

Rods Induction hardened C1045 steel alloy*

Base castings and rod clevises Ductile iron

Cylinder heads High tensile strength gray iron

Seals 70 durometer Buna N piston o-rings with Polyurethane back-ups

Double lipped Polyurethane u-cup rod seal

*Rods over 3/4" diameter, strokes up to 65"

STANDARD FEATURES

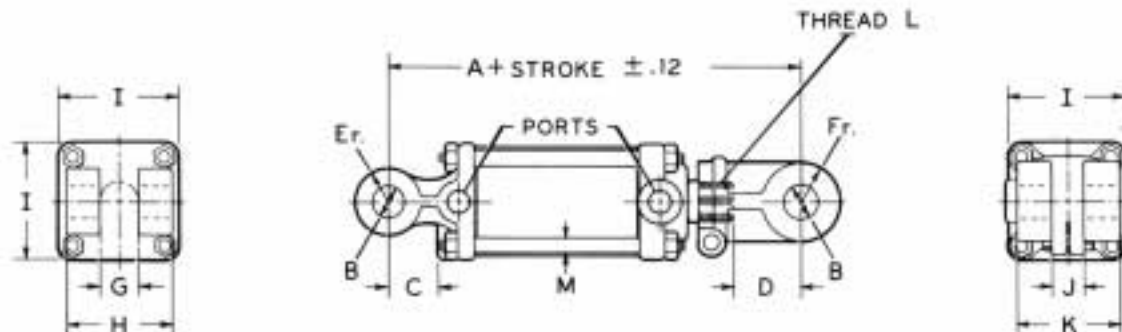
- Cylinder barrels are skived burnished precision finished to provide long seal life
- Rods are hardened, chrome plated and polished for long wear life and for protection from external damage and corrosion
- Rod wipers clean dirt and foreign matter from rod to insure long seal life
- High tensile strength tie rods with rolled threads for durability
- NPTF dryseal pipe thread ports in line with pins
- Double ported base allows connections to be made at 90° to pins

OPTIONAL FEATURES AVAILABLE

- SAE straight thread o-ring ports
- Pineye or single lug rod end mountings
- Hardened steel pins and bushings
- Breather plugs



DIMENSIONAL DATA in inches and (millimeters)

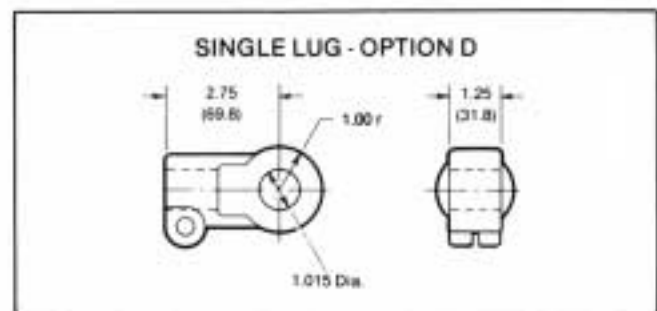
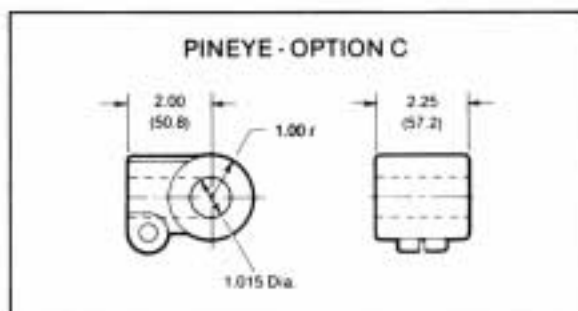


ALL DIMENSIONS ARE NOMINAL and ARE FOR STANDARD CONFIGURATIONS

| BORE DIA. | A | B | C | D | Er. | Fr. | G | H | I | J | K | L | M |
|---------------|----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|------------------|-----------------|-----------------|-----------------------------------|----------------|
| 2.00 (51) | 10.25 (260) | 1.015 (25.8) | 1.625 (41.3) | 2.125 (53.9) | .875 (22.2) | 1.000 (25.4) | 1.125 (28.6) | 2.500 (63.5) | 2.875 (73.0) | 1.125 (28.6) | 2.625 (66.7) | 1 ¹ / ₄ -12 | .375 (9.5) |
| 2.50 (64) | 10.25 (260) | 1.015 (25.8) | 1.625 (41.3) | 2.125 (53.9) | 1.000 (25.4) | 1.000 (25.4) | 1.125 (28.6) | 2.625 (66.7) | 3.250 (82.6) | 1.125 (28.6) | 2.625 (66.7) | 1 ¹ / ₄ -12 | .375 (9.5) |
| 3.00 (76) | 10.25 (260) | 1.015 (25.8) | 1.625 (41.3) | 2.125 (53.9) | 1.000 (25.4) | 1.000 (25.4) | 1.125 (28.6) | 2.625 (66.7) | 3.750 (95.3) | 1.125 (28.6) | 2.625 (66.7) | 1 ¹ / ₄ -12 | .500 (12.7) |
| 3.50 (89) | 10.25 (260) | 1.015 (25.8) | 1.625 (41.3) | 2.125 (53.9) | 1.000 (25.4) | 1.250 (31.8) | 1.250 (31.8) | 2.750 (69.8) | 4.250 (107.9) | 1.250 (31.8) | 2.750 (69.8) | 1 ¹ / ₄ -12 | .562 (14.3) |
| 4.00 (102) | 10.62 (270) | 1.015 (25.8) | 2.000 (50.8) | 2.125 (53.9) | 1.125 (28.6) | 1.250 (31.8) | 1.250 (31.8) | 2.875 (73.0) | 5.000 (127) | 1.250 (31.8) | 2.750 (69.8) | 1 ¹ / ₄ -12 | .625 (15.9) |
| 5.00 (127) | 12.25 (311) | 1.015 (25.8) | 2.312 (58.7) | 2.125 (53.9) | 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) | * | .750 (19.0) |

*1¹/₂-12 for cylinders in distributor program.

OPTIONAL ROD END MOUNTINGS



These rod end mountings are optionally available on the 2", 2¹/₂", 3", 3¹/₂" and 4" diameter bore size cylinders only. (Standard mounting clevis will be supplied unless otherwise specified.)



HYDRAULIC CYLINDERS

TIE ROD CYLINDERS
DB SERIES
Specification Sheet

CYLINDER PORTS AND RODS

| BORE DIA. | SIZE & TYPE PORTS | | STANDARD RODS* | | OPTIONAL RODS | |
|---------------|-------------------|-------------------------|------------------|---------------|------------------------------|------------------------|
| | STANDARD | OPTIONAL | DIA. | MAX. STROKE** | DIA. | MAX. STROKE** |
| 2.00 (51) | 3/8 NPTF | 9/16-18 SAE 1/4 NPTF | 1.062 (26.97) | 19" (483) | 1.125 (28.6) | 22" (559) |
| 2.50 (64) | 3/8 NPTF | 9/16-18 SAE 1/4 NPTF | 1.062 (26.97) | 14" (356) | 1.25 (25.4) | 21" (533) |
| 3.00 (76) | 1/2 NPTF | 3/4-16 SAE 3/8 NPTF | 1.250 (31.8) | 17" (432) | 1.500 (38.1) | 27" (686) |
| 3.50 (89) | 1/2 NPTF | 3/4-16 SAE 3/8 NPTF | 1.250 (31.8) | 14" (356) | 1.500 (38.1) | 22" (559) |
| 4.00 (102) | 1/2 NPTF | 3/4-16 SAE 3/8 NPTF | 1.500 (38.1) | 19" (483) | 1.250 (31.8) 2.000 (50.8) | 11" (279) 38" (965) |
| 5.00 (127) | 1/2 NPTF | 3/4-16 SAE 3/8 NPTF | 2.000 (50.8) | 28" (711) | 1.500 (38.1) | 13" (330) |

*Consult CROSS Full Line catalog for rod sizes applicable to distributor program.

**At 2500 psi rated operating pressure. Longer strokes are possible at reduced pressures. Additionally, smaller diameter rods can be provided for usage at lower pressures or shorter length strokes. Consult CROSS Sales Dept. for maximum stroke at given pressures. For extended cylinder lengths of over 30" (762 mm), 1" (25.4 mm) of stop tubing should be used for each additional 10" (254 mm) of stroke. Stroke limitation applies to compressive loading only.

CLEVIS PINS

| BORE DIA. | | STANDARD PINS | | | | OPTIONAL PINS | | | |
|-----------|-------|---------------|--------|-------------|-------|----------------|--------|-------------|-------|
| | | DIA. / MAT'L | | MAX. PRESS. | | DIA. / MAT'L | | MAX. PRESS. | |
| INCHES | mm | INCHES | mm | PSI | BAR | INCHES | mm | PSI | BAR |
| 2.00 | (51) | 1.00 | (25.4) | 2500 | (172) | NONE | | | |
| | | STEEL | | | | | | | |
| 2.50 | (64) | 1.00 | (25.4) | 2500 | (172) | NONE | | | |
| | | STEEL | | | | | | | |
| 3.00 | (76) | 1.00 | (25.4) | 2500 | (172) | NONE | | | |
| | | STEEL | | | | | | | |
| 3.50 | (89) | 1.00 | (25.4) | 2000 | (138) | 1.00 | (25.4) | 2500 | (172) |
| | | STEEL | | | | HARDENED STEEL | | | |
| 4.00 | (102) | 1.00 | (25.4) | 1500 | (103) | 1.00 | (25.4) | 2500 | (172) |
| | | STEEL | | | | HARDENED STEEL | | | |
| 5.00 | (127) | 1.00 | (25.4) | 1000 | (69) | 1.25 | (31.8) | 2500 | (172) |
| | | STEEL | | | | HARDENED STEEL | | | |

Hardened steel bushings are provided with hardened steel pins.



ORDERING INFORMATION

(Standard configurations will be supplied unless specified)

| SERIES | BORE DIA. INCH x 100 | STROKE INCH x 100 | ROD DIA. INCH x 100 | PORT SIZE and TYPE | END MOUNTING | CLEVIS PIN | OTHER |
|--------|----------------------------|-------------------------|---------------------------|-----------------------|--|---------------|-------------------------------|
| DB | 200 | AS REQUIRED | 106 | C 3/16-18 SAE | C CLEVIS (Standard) P PINEYE S SINGLE LUG | A | O NONE X SPECIFY |
| | 250 | | 125 | D 1/4-16 SAE | | 1.00 STL. | |
| | 300 | | 150 | N 1/4 NPTF | | B | |
| | 350 | | 200 | P 3/4 NPTF | | 1.00 HARD | |
| | 400 | | | R 1/2 NPTF | | C | |
| | 500 | | | S 3/4 NPTF | | 1.25 HARD | |
| | | | | | | D | |
| | | | | | | NONE | |
| | | | | | | (1.015 hole) | |
| | | | | | | E | |
| | | | | | | NONE | |
| | | | | | | (1.265 hole) | |

EXAMPLE: DB250-1500-106CCAO is a standard 2 1/2" bore diameter DB Series cylinder with 15" stroke, 1.062" dia.rod, 3/16 - 18 ports, standard clevis end mountings with 1" dia. steel clevis pins.

ASAE STANDARD CYLINDERS

The DB-ASAE cylinders are designed for use where ASAE 8" and 16" stroke cylinders are required. To obtain an ASAE cylinder, the following model number may be used. Characteristics of these cylinders are shown for reference purposes as there are no options available. (Contact CROSS Sales Department for DB-ASAE cylinders with SAE straight thread o-ring ports).

| MODEL NUMBER | BORE DIA. INCHES | STROKE INCHES | ROD DIA. INCHES | CLOSED CENTER DIM. INCHES | PORT SIZE & TYPE | CLEVIS PIN | WEIGHT LBS. |
|-----------------|---------------------|------------------|--------------------|------------------------------|---------------------|---------------|----------------|
| 208DB-ASAE | 2 | 8 | 1 1/16 | 20 1/4 | 3/8" NPTF | 1" | 18 |
| 2508DB-ASAE | 2 1/2 | 8 | 1 1/16 | 20 1/4 | 3/8" NPTF | 1" | 20 |
| 308DB-ASAE | 3 | 8 | 1 1/4 | 20 1/4 | 1/2" NPTF | 1" | 24 |
| 3508DB-ASAE | 3 1/2 | 8 | 1 1/4 | 20 1/4 | 1/2" NPTF | 1" | 30 |
| 408DB-ASAE | 4 | 8 | 1 1/4 | 20 1/4 | 1/2" NPTF | 1" | 37 |
| 508DB-ASAE | 5 | 8 | 1 1/2 | 20 1/4 | 1/2" NPTF | 1" * | 66 |
| 316DB-ASAE | 3 | 16 | 1 1/4 | 31 1/2 | 1/2" NPTF | 1 1/4" | 35 |
| 3516DB-ASAE | 3 1/2 | 16 | 1 1/2 | 31 1/2 | 1/2" NPTF | 1 1/4" | 51 |
| 416DB-ASAE | 4 | 16 | 2 | 31 1/2 | 1/2" NPTF | 1 1/4" | 65 |
| 516DB-ASAE | 5 | 16 | 2 | 31 1/2 | 1/2" NPTF | 1 1/4" | 88 |

* Limited to 1500 psi maximum operating pressure



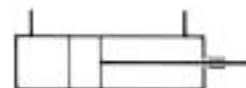
CROSS MANUFACTURING, INC.
100 Factory Street
Lewis, Kansas 67552
Phone: 620/324-5525 fax -5737



HYDRAULIC CYLINDERS

with Mechanical Depth Stop Option

TIE ROD CYLINDERS
DE-ASAE, DU SERIES
Specification Sheet



The CROSS series DE and DU tie rod cylinders have been designed for use where an 8" stroke ASAE mechanical depth stop cylinder may be required. The DE-ASAE incorporates the depth control collar. The DU cylinder features a threaded rod extension so that a mechanical depth control collar may be added if desired. For requirements not needing the depth control, refer to the CROSS DB series.

GENERAL SPECIFICATIONS

Rated working pressure (Max. relief valve setting at full flow)2500 psi (172 bar)*

Maximum shock and surge pressure4000 psi (276 bar)

| | | | | | | |
|--------------------------|------|------|------|------|------|--------|
| Bore diameters | 2.00 | 2.50 | 3.00 | 3.50 | 4.00 | inches |
| | 51 | 64 | 76 | 89 | 102 | mm |

*See pin recommendations on reverse.

MATERIAL SPECIFICATIONS

Cylinder barrelsC1025 steel alloy

PistonsHigh strength aluminum alloy

RodsInduction hardened C1045 steel alloy

Base castings and rod clevisesDuctile iron

Cylinder headsHigh tensile strength gray iron

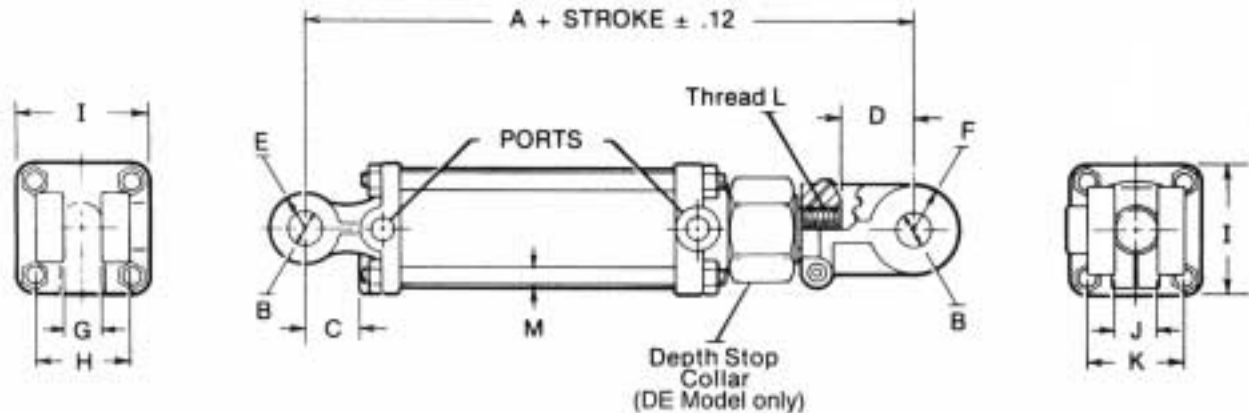
Seals70 durometer Buna N piston o-rings with Polyurethane back-ups
Double lipped Polyurethane u-cup seal

STANDARD FEATURES

- Mechanical depth stop collar (2 1/4" adjustment) (1 1/8" adjustment on 4" bore) on DE
- 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
- Double ported base allows connections to be made at 90° to pins
- NPTF dryseal pipe thread ports
- Standard ASAE 8" stroke



DIMENSIONAL DATA in inches and (millimeters)



ALL DIMENSIONS ARE NOMINAL AND ARE FOR STANDARD CONFIGURATIONS.

| BORE DIA. | A | B | C | D | E | F | G | H | I | J | K | L | M |
|---------------|----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|------------------|-----------------|-----------------|---------------|----------------|
| 2.00 (51) | 12.25 (311) | 1.015 (25.8) | 1.625 (41.3) | 2.125 (53.9) | .875 (22.2) | 1.000 (25.4) | 1.125 (28.6) | 2.500 (63.5) | 2.875 (73.0) | 1.125 (28.6) | 2.625 (66.7) | 1 1/16 -12 | .375 (9.5) |
| 2.50 (64) | 12.25 (311) | 1.015 (25.8) | 1.625 (41.3) | 2.125 (53.9) | 1.000 (25.4) | 1.000 (25.4) | 1.125 (28.6) | 2.625 (66.7) | 3.250 (82.6) | 1.125 (28.6) | 2.625 (66.7) | 1 1/16 -12 | .375 (9.5) |
| 3.00 (76) | 12.25 (311) | 1.015 (25.8) | 1.625 (41.3) | 2.125 (53.9) | 1.000 (25.4) | 1.000 (25.4) | 1.125 (28.6) | 2.625 (66.7) | 3.750 (95.2) | 1.125 (28.6) | 2.625 (66.7) | 1 1/4 -12 | .500 (12.7) |
| 3.50 (89) | 12.25 (311) | 1.015 (25.8) | 1.625 (41.3) | 2.125 (53.9) | 1.000 (25.4) | 1.000 (25.4) | 1.250 (31.8) | 2.750 (69.8) | 4.250 (107.9) | 1.250 (31.8) | 2.750 (69.8) | 1 1/4 -12 | .562 (14.3) |
| 4.00 (102) | 12.25 (311) | 1.015 (25.8) | 2.000 (50.8) | 2.125 (53.9) | 1.125 (28.6) | 1.000 (25.4) | 1.250 (31.8) | 2.875 (73.0) | 5.000 (127) | 1.250 (31.8) | 2.750 (69.8) | 1 1/4 -12 | .625 (15.9) |

PIN RECOMMENDATIONS: For pressures above 2000 psi on 3 1/2" bore or 1500 psi on 4" bore, hardened pins and bushings are required.

ORDERING INFORMATION

Characteristics of the DE-ASAE and DU cylinders are shown for reference purposes. (Contact CROSS Sales Department for DE-ASAE or DU cylinders with SAE straight thread o-ring ports or hardened pins and bushings.)

| MODEL NUMBER | BORE DIA. inches mm | ROD DIA. inches mm | PIN DIA. inches mm | PORT size type | WEIGHT lbs. Kg |
|--------------|------------------------|-----------------------|-----------------------|-------------------|-------------------|
| 208 | 2.00 (51) | 1.062 (27.0) | 1 (25.4) | 3/8 NPTF | 20 (9.07) |
| 2508 | 2.50 (64) | 1.062 (27.0) | 1 (25.4) | 3/8 NPTF | 21 (9.5) |
| 308 | 3.00 (76) | 1.250 (31.8) | 1 (25.4) | 1/2 NPTF | 25 (11.34) |
| 3508 | 3.50 (89) | 1.250 (31.8) | 1 (25.4) | 1/2 NPTF | 33 (14.97) |
| 408 | 4.00 (102) | 1.250 (31.8) | 1 (25.4) | 1/2 NPTF | 44 (19.96) |



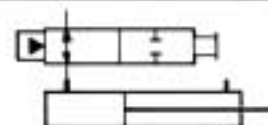
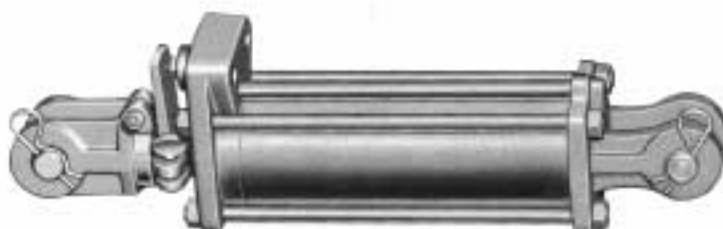
CROSS MANUFACTURING, INC.
100 Factory Street
Lewis, Kansas 67552
Phone 620/324-5525 fax -5737



HYDRAULIC CYLINDERS

with Hydraulic Depth Control

TIE ROD CYLINDERS
DC SERIES
Specification Sheet



The CROSS series DC tie rod type hydraulic cylinders feature hydraulic depth control with an infinitely variable adjustment from zero to maximum stroke. 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 | 3.00 | 3.50 | 4.00 | 5.00 | in. |
| | 76 | 89 | 102 | 127 | mm |

MATERIAL SPECIFICATIONS

Cylinder barrels ST 52.3 steel alloy
Pistons High strength aluminum or gray iron
Rods Introduction hardened C1045 steel alloy
Base castings and rod clevises Ductile iron
Cylinder heads High tensile strength gray iron
Seals70 durometer Buna N o-rings with polyurethane back-up rings
. Double lipped polyurethane u-cup rod seal

STANDARD FEATURES

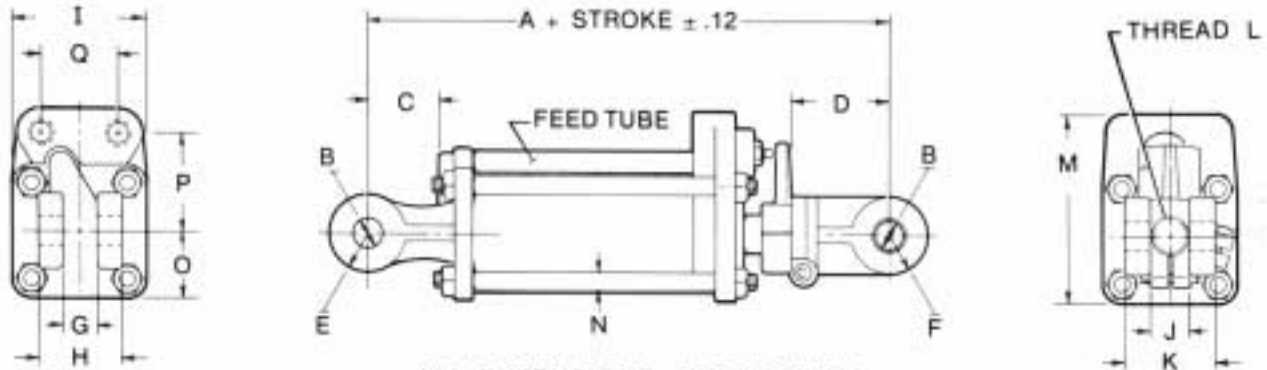
- Infinitely adjustable stroke from zero to maximum stroke
- Heavy duty rod clevis with hardened steel bushings
- Hardened steel pins
- Cylinder barrels are skived burnished precision finished to provide long seal life
- Rods are hardened, chrome plated and polished for long wear life and for protection 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
- NPTF dryseal pipe thread ports
- Standard ASAE 8" and 16" strokes

OPTIONAL FEATURES AVAILABLE

- SAE straight thread o-ring ports (top ported)
- 1.25 diameter hardened pins (standard on 16" stroke ASAE and 5.00 bore diameter cylinders)



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 | Q |
|---------------|----------------|-----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|--------------|-----------------|---------------|----------------|----------------|----------------|
| 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) | 2.50 (63.5) |
| 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) | 2.50 (63.5) |
| 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) | 2.50 (63.5) |
| 5.0" (127) | 12.25 (305) | 1.265 (32.1) | 2.28 (57.9) | 3.25 (82.5) | 1.41 (35.8) | 1.25 (31.8) | 1.34 (34.0) | 3.50 (88.9) | 6.00 (152) | 1.25 (31.8) | 2.75 (69.8) | 1 1/4 -12 | 7.26 (184.4) | .75 (19.0) | 3.0 (76.2) | 3.54 (89.9) | 2.50 (63.5) |

CYLINDER PORTS and RODS

| BORE DIA. | PORT SIZE & TYPE | | 8 INCH STROKE (20.25" RETRACTED) | | | 16 INCH STROKE (31.5" RETRACTED) | |
|--------------|------------------|----------|-------------------------------------|----------------|----------------|-------------------------------------|----------------|
| | STANDARD | OPTIONAL | STD. ROD | OPT. ROD. | | STD. ROD | OPT. ROD. |
| 3.0" (76) | 1/2" NPTF | 3/4-16 | 1.25 (31.8) | 1.50 (38.1) | | 1.25 (31.8) | 1.50 (38.1) |
| 3.5" (89) | | | 1.25 (31.8) | 1.50 (38.1) | 1.75 (44.4) | 1.50 (38.1) | NONE |
| 4" (102) | 1/2" NPTF | 3/4-16 | 1.25 (31.8) | 1.50 (38.1) | 2.00 (50.8) | 1.75* (44.4) | 2.00 (50.8) |
| 5" (127) | 1/2" NPTF | 3/4-16 | 2.00 (50.8) | 1.75 (44.4) | | 2.00 (50.8) | NONE |

* Limited to 2300 psi maximum working pressure.

ORDERING INFORMATION

| SERIES | BORE DIA. (in. x 100) | STROKES (in. x 100) | ROD DIA. (in. x 100) | PORT SIZE & TYPE |
|--------|--------------------------|------------------------|-------------------------|------------------|
| DC | 300 | 800 1600 | 125 | D |
| | 350 | | 150 | 3/4 - 16 SAE |
| | 400 | | 175 | R |
| | 500 | | 200 | 1/2 NPTF |

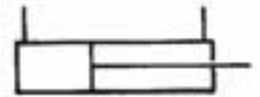


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HYDRAULIC CYLINDERS

TIE ROD CYLINDERS
DH SERIES
Specification Sheet



The DH cylinder is rated to a full 3000 psi working pressure and designed for tough applications. It is the cylinder of choice for today's higher pressure systems. Upgraded castings and heavy duty seals assure peak performance and a long and dependable service life.

GENERAL SPECIFICATIONS

Rated continuous working pressure (Max. relief valve setting at full flow) . . .3000 psi
(207 bar)
Maximum proof pressure6000 psi (414bar)

| | | | | | | |
|--------------------------|------|------|------|------|------|--------|
| Bore diameters | 2.00 | 2.50 | 3.00 | 3.50 | 4.00 | inches |
| | 51 | 64 | 76 | 89 | 102 | mm |

MATERIAL SPECIFICATIONS

Cylinder barrels ST52.3 steel alloy
Pistons Aluminum alloy
Rods Induction hardened C1045 steel alloy
Base castings and rod clevises Ductile iron
Cylinder heads High tensile strength grey iron on 2" and 2 1/2" bores
Ductile iron 3" bore and up
Seals O-ring with backup on tube; Wear ring and teflon seal on piston
Double lipped polyurethane u-cup rod seal

STANDARD FEATURES

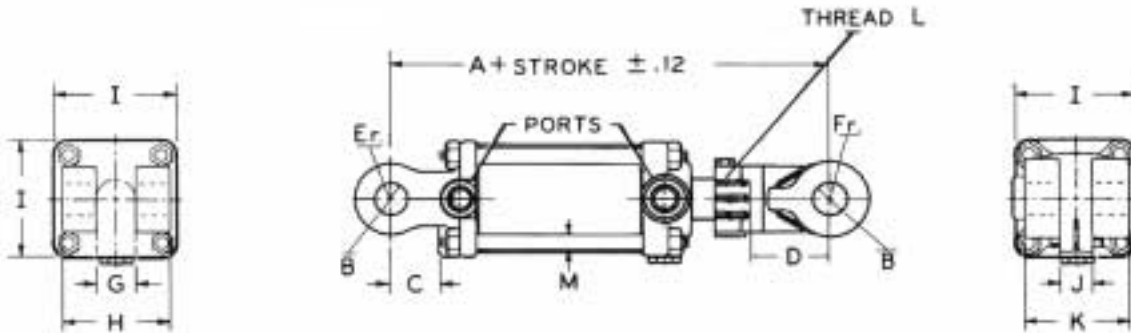
- Cylinder barrels are skived burnished precision finished to provide long seal life
- Rods are hardened, chrome plated and polished for long wear life and for protection from external damage corrosion
- Rod wipers clean dirt and foreign matter from rod to insure long seal life
- High tensile strength tie rods with rolled threads for durability
- Double ported base allows connections to be made at 90° to pins
- SAE straight thread o-ring ports
- Hardened steel pins 3", 3 1/2" and 4" bore

OPTIONAL FEATURES

- Bushings
- Breather plugs



DIMENSIONAL DATA in inches and (millimeters)



ALL DIMENSIONS ARE NOMINAL and ARE FOR STANDARD CONFIGURATIONS

| BORE DIA. | A | B | C | D | Er | Fr | G | H | I | J | K | L | M |
|---------------|----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|------------------|-----------------|-----------------|----------|----------------|
| 2.00 (51) | 10.25 (260) | 1.015 (25.8) | 1.625 (41.3) | 2.125 (53.9) | .875 (22.2) | 1.000 (25.4) | 1.125 (28.6) | 2.500 (63.5) | 2.875 (73.0) | 1.125 (28.6) | 2.625 (66.7) | 1 1/8-12 | .375 (9.5) |
| 2.50 (64) | 10.25 (260) | 1.015 (25.8) | 1.625 (41.3) | 2.125 (53.9) | 1.000 (25.4) | 1.000 (25.4) | 1.125 (28.6) | 2.625 (66.7) | 3.250 (82.6) | 1.125 (28.6) | 2.625 (66.7) | 1 1/8-12 | .375 (9.5) |
| 3.00 (76) | 10.25 (260) | 1.015 (25.8) | 1.938 (49.2) | 2.125 (53.9) | 1.125 (28.6) | 1.125 (28.6) | 1.125 (28.6) | 2.625 (66.7) | 3.750 (95.3) | 1.125 (28.6) | 2.625 (66.7) | 1 1/8-12 | .500 (12.7) |
| 3.50 (89) | 10.25 (260) | 1.015 (25.8) | 2.000 (50.8) | 2.125 (53.9) | 1.125 (28.6) | 1.125 (28.6) | 1.250 (31.8) | 2.750 (69.8) | 4.250 (107.9) | 1.125 (28.6) | 2.625 (66.7) | 1 1/8-12 | .562 (14.3) |
| 4.00 (102) | 10.62 (270) | 1.015 (25.8) | 2.000 (50.8) | 2.125 (53.9) | 1.125 (28.6) | 1.125 (28.6) | 1.250 (31.8) | 2.875 (73.0) | 5.000 (127) | 1.125 (28.6) | 2.625 (66.7) | 1 1/8-12 | .625 (15.9) |

SEE DH-ASAE Cylinders on Page 4 for special closed center and clevis pins specifications on certain 8 & 16 inch stroke cylinders.

Port Sizes: 9/16-18 SAE are standard on 2" & 2 1/2" bores
 3/4 - 16 SAE standard on 3" through 4" bores
 NPTF threads are not available



HYDRAULIC CYLINDERS

TIE ROD CYLINDERS
DH SERIES
Specification Sheet

STANDARD DH CYLINDER SIZES

| Description | Rod Dia. * | Closed Center | ** |
|-------------|------------|---------------|------|
| 208DH-ASAE | 1.06 | 20.25 | 3000 |
| 210DH | 1.06 | 20.25 | 3000 |
| 212DH | 1.06 | 22.25 | 3000 |
| 214DH | 1.06 | 24.25 | 3000 |
| 216DH | 1.12 | 26.25 | 3000 |
| 218DH | 1.12 | 28.25 | 3000 |
| 220DH | 1.12 | 30.25 | 2387 |
| 224DH | 1.12 | 34.25 | 1783 |
| 230DH | 1.12 | 40.25 | 1225 |
| 2508DH-ASAE | 1.25 | 20.25 | 3000 |
| 2510DH | 1.25 | 20.25 | 3000 |
| 2512DH | 1.25 | 22.25 | 3000 |
| 2514DH | 1.25 | 24.25 | 3000 |
| 2516DH | 1.25 | 26.25 | 3000 |
| 2518DH | 1.25 | 28.25 | 2802 |
| 2520DH | 1.25 | 30.25 | 2363 |
| 2524DH | 1.25 | 34.25 | 1752 |
| 2530DH | 1.25 | 40.25 | 1202 |
| 308DH-ASAE | 1.25 | 20.25 | 3000 |
| 310DH | 1.25 | 20.25 | 3000 |
| 312DH | 1.25 | 22.25 | 3000 |
| 314DH | 1.50 | 24.25 | 3000 |
| 316DH-ASAE | 1.50 | 31.50 | 3000 |
| 318DH | 1.50 | 28.25 | 3000 |
| 320DH | 1.50 | 30.25 | 3000 |
| 324DH | 1.50 | 34.25 | 2455 |
| 330DH | 1.50 | 40.25 | 1691 |
| 336DH | 1.50 | 46.25 | 1231 |
| 3508DH-ASAE | 1.25 | 20.25 | 3000 |
| 3510DH | 1.25 | 20.25 | 3000 |
| 3512DH | 1.50 | 22.25 | 3000 |
| 3514DH | 1.50 | 24.25 | 3000 |
| 3516DH-ASAE | 1.50 | 31.50 | 3000 |
| 3518DH | 1.50 | 28.25 | 3000 |
| 3520DH | 1.75 | 30.25 | 3000 |
| 3524DH | 1.75 | 34.25 | 3000 |
| 3530DH | 1.75 | 40.25 | 2333 |
| 3536DH | 1.75 | 46.25 | 1694 |
| 408DH-ASAE | 1.25 | 20.25 | 3000 |
| 410DH | 1.50 | 20.62 | 3000 |
| 412DH | 1.50 | 22.62 | 3000 |
| 414DH | 1.50 | 24.62 | 3000 |
| 416DH-ASAE | 2.00 | 31.50 | 3000 |
| 418DH | 2.00 | 28.62 | 3000 |
| 420DH | 2.00 | 30.62 | 3000 |
| 424DH | 2.00 | 34.62 | 3000 |
| 430DH | 2.00 | 40.62 | 3000 |
| 436DH | 2.00 | 46.62 | 2240 |

* Piston rods are sized with a safety factor of 2. ** Max. PSI at base port due to column loading.



ORDERING INFORMATION

| SERIES | BORE DIA. INCH X 100 | STROKE INCH X 100 | ROD DIA. INCH X 100 | PORT SIZE (SAE ONLY) | END MOUNT ING | CLEVIS PIN | OTHER |
|--------|----------------------------|----------------------|---------------------------|-------------------------|------------------|------------------|--------------|
| DH | 200 | AS | 106 | C - 9/16-18 SAE | C | A. 1.00 STEEL | 0 - NONE |
| | 250 | REQUIRED | 112 | D - 3/4-16 SAE | CLEVIS (STD.) | B. 1.00 HARD | X SPECIFY |
| | 300 | | 125 | | | C. 1.25 HARD | |
| | 350 | | 150 | | | | |
| | 400 | | 175 | | | | |
| | | | 200 | | | | |

ASAE STANDARD CYLINDERS

The DH-ASAE cylinders are designed for use where 8" and 16" stroke ASAE cylinders are required to match specifications on certain types of equipment. Pin sizes and closed centers are standardized on these cylinders to match ASAE specifications. Therefore, no additional options are available.

| MODEL NUMBER | BORE DIA. INCHES | STROKE INCHES | ROD DIA. INCHES | CLOSED CTR. DIM. INCHES | PORTING | CLEVIS PIN | WEIGHT LBS. |
|--------------|---------------------|------------------|--------------------|----------------------------|-------------|------------|-------------|
| 208DH-ASAE | 2 | 8 | 1.06 | 20.25 | 9/16-18 SAE | 1" | 18 |
| 2508DH-ASAE | 2 1/2 | 8 | 1.25 | 20.25 | 9/16-18 SAE | 1" | 20 |
| 308DH-ASAE | 3 | 8 | 1.25 | 20.25 | 3/4-16 SAE | 1" | 24 |
| 3508DH-ASAE | 3 1/2 | 8 | 1.25 | 20.25 | 3/4-16 SAE | 1" | 30 |
| 408DH-ASAE | 4 | 8 | 1.25 | 20.25 | 3/4-16 SAE | 1" | 37 |
| 316DH-ASAE | 3 | 16 | 1.50 | 31.50 | 3/4-16 SAE | 1 1/4" | 35 |
| 3516DH-ASAE | 3 1/2 | 16 | 1.50 | 31.50 | 3/4-16 SAE | 1 1/4" | 51 |
| 416DH-ASAE | 4 | 16 | 2.00 | 31.50 | 3/4-16 SAE | 1 1/4" | 65 |



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Lewis, Kansas 67552
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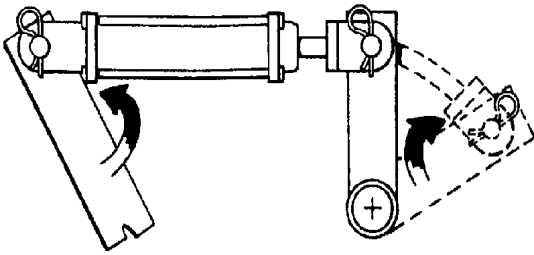


HYDRAULIC CYLINDER SAFETY

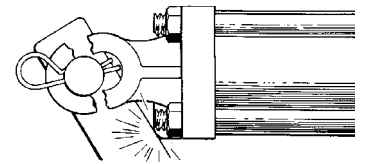
General Cautions:

- Always use a relief or bypass in your hydraulic system to prevent personal injury and/or breakage of equipment or components. Never operate a cylinder above rated pressures.
- Never use a cylinder as a transport device.
- Use correct fittings and proper hydraulic oil - Contact CROSS if you have questions.

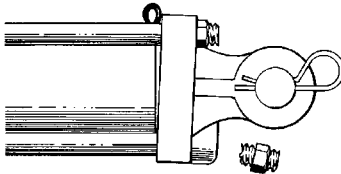
Binding



Check clevis clearances before, during and after extending the cylinder and before using the cylinder under pressure to avoid possible injury, or bent or broken rods or clevises caused by binding.

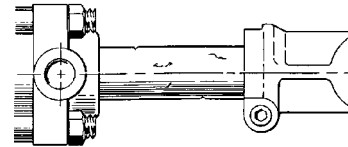


Too much pressure causes...



Extruded static seals and/or broken tie rods. Check pressure rating of cylinder against pump pressure of the tractor.

Rough or scored rod



Protect the rod at all times and make sure that nothing hits or rubs it when it is extended. Rough places on the rod damage the seals and reduce their normal life resulting in the necessity for frequent replacement.

Dirty Oil

Oil must be filtered to a minimum of 25 microns. Filters should be changed regularly - spin-on types after 50 hours of initial use and then after every two hundred fifty hours of use. Use of a condition indicator is recommended. Consult your tractor or implement owner's manual for filtration and changing recommendations for internal systems

Pinhole Leaks

If you observe a pinhole leak, discontinue use of the component. If oil has penetrated your skin or contacted your eye, seek medical attention immediately!



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