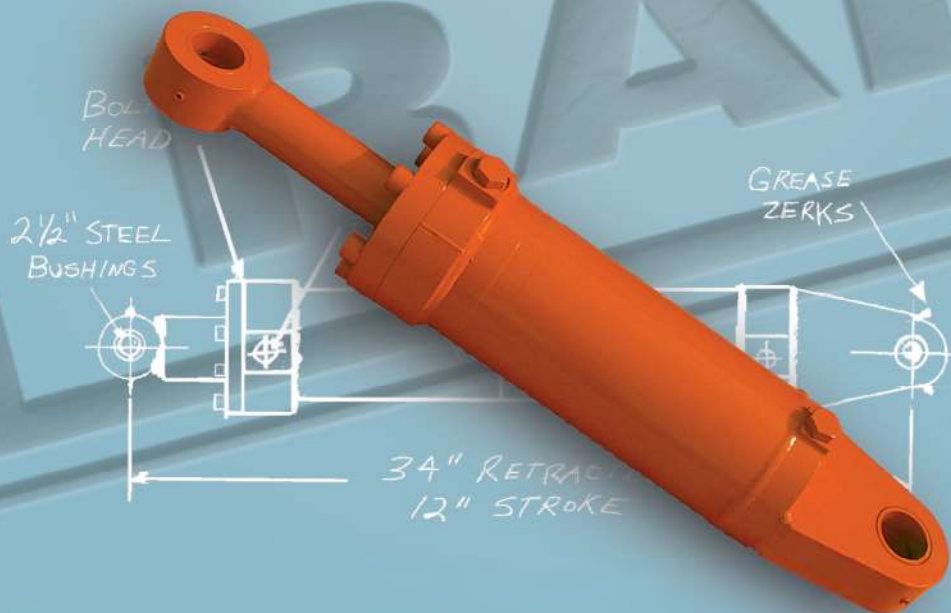




HYDRAULIC CYLINDERS & OEM SERVICES



OEM HYDRAULIC CYLINDER SPECIALISTS



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RAM Industries Inc. was established in 1973 in Yorkton, Saskatchewan. In the early years, the Company focused on meeting demand for hydraulic and pneumatic cylinders from agricultural manufacturers across the region. RAM's reputation as a reliable cylinder supplier quickly grew.

Fifty years and five factory expansions later, custom cylinder design and manufacturing remains at the core of RAM's operations and expertise. Today, RAM Industries serves a diverse range of clients in industries that include oil & gas, construction, mining, forestry, transportation, agriculture, material handling, and industrial equipment manufacturers.

As a custom manufacturer, RAM establishes a close technical rapport with every client to share ideas and gather information regarding cylinder fit and performance requirements. RAM has extensive experience working with purchasers, procurement experts, engineering teams, consultants, manufacturing specialists, maintenance managers, and entrepreneurs developing new product innovations that require custom cylinders.

RAM can supply cylinder products from pre-engineered cylinder drawings; however complete design services are often the norm. Designs may evolve from a basic list of technical specifications or a Customer's conceptual idea.

RAM has extensive experience delivering cylinder solutions to meet requirements such as cost reduction objectives, hydraulic system space limitations, or performance improvements. Reverse engineering for replacement or repair cylinders, and re-engineering foreign cylinders to meet North American dimensional and material standards are also available.

Our technical sales and engineering teams will work closely with you to design and build a cylinder solution for your specific needs.

RAM's flexible manufacturing setup simultaneously accommodates multiple cylinder designs, low and high volume orders, basic to sophisticated machining, and a wide range of cylinder sizes. RAM uses ERP tracking to closely monitor production progress of your order. We are committed to ensuring the right number of cylinders are shipped on time, every time, at the cost and quality standards you expect.

RAM has become synonymous with quality built, reliable cylinder solutions.

Join the growing list of companies that trust their reputation and equipment performance on the RAM name!

RAM CYLINDER APPLICATIONS

RAM has extensive experience serving a wide range of original equipment manufacturers and industries. Examples of our cylinder expertise includes designs for the following applications:

AGRICULTURE

- Seeding Equipment
- Tillage
- Bale Processors
- Tree Shakers
- Grain Augers
- Manure Spreaders
- Sprayers
- Harvesting Machinery
- Animal Squeeze Chutes
- Orchard Gondolas

CONSTRUCTION

- Articulating Trucks
- Drills
- Backhoes
- Graders
- Dozers
- Paving Equipment
- Construction Cranes
- Excavators
- Land Scrapers
- Pay Loaders

MINING & FORESTRY

- Rock Diggers
- Conveyors
- Stackers
- Mine Crushers
- Log Loaders
- Saw Mill Equipment
- Log Splitters
- Tree Spades
- Brush Cutters
- Lumber Sorters

MATERIAL HANDLING

- Drum Crushers
- Vacuum Trucks
- River Dredging
- Snow Plows
- Street Sweepers
- Aerial Man Lifts
- Attachments
- Warehouse Equipment
- Sanding Trucks
- Forklifts

OIL & GAS

- Artificial Lifts
- Oil Rig Movers
- Fracking Systems
- Drilling Equipment
- Gas Compression
- Catwalks
- Mast Raising
- Service Rigs
- Pipe Handlers
- Top Drives

TRANSPORTATION

- Wreckers
- Boat Cranes
- Truck Box Hoists
- Trailers
- Loading Dock Levelers
- Tow Trucks
- Aircraft Mover/Lifters
- Helicopter Grapples
- Garbage Trucks
- Deicing Equipment

COMMERCIAL

- Golf Course Equipment
- Cellular Towers
- Car Crushers
- Wheelchair Lifts
- Turf Equipment
- Security Barricades
- Elevators
- Personal Lift Systems
- Compactors
- Trenchless Pipe Equipment

INDUSTRIAL

- Hammer Mills
- Press Brakes
- Hydraulic Torque Wrenches
- Solar Panel Arrays
- Waste Grinders
- Oil Filter Crusher
- Plastic Molding Equipment
- Rail Line Repair Equipment
- Manufacturing Jigs



RAM QUALITY

Since 2000, RAM Industries Inc. has maintained ISO 9001 Certification for cylinder manufacturing and custom machining services. ISO is defined by the International Organization for Standardization as standards that “ensure products and services are safe, reliable and of good quality.” The ISO 9001 standards specifically set out criteria by which RAM developed its Quality System. It is based on a number of ISO management principles that retain a strong focus on the customer throughout all processes in the organization.

At the start of each relationship, field sales personnel and RAM's experienced engineering team will guide clients through the technical specifications of their cylinder and machining needs. Engineering services use 2D and 3D modeling to provide critical dimensions and simulated images of each cylinder design. These files can be integrated into equipment engineering files, and are beneficial tools for final design verification.

On-site visits, meetings, technical support, and prototype services are also available to confirm cylinder fit and function with your equipment before full orders proceed to production.

The RAM Quality System continues through all manufacturing stages up to final assembly. One hundred percent of cylinders are tested before they are individually packaged and shipped.

After every delivery, customers continue to receive support in the form of installation and technical guidance, parts, warranty and repair assistance. This is part of RAM's full service approach to every relationship.

RAM's Quality Committee oversees a regular schedule of internal and external quality audits. The audit process provides valuable feedback to the entire organization for continuous improvement of the Quality System. This ultimately benefits the many RAM customers who rely on consistent delivery of quality cylinders custom manufactured to their needs.

RAM is also experienced meeting quality requirements specific to other quality standards or independent bodies (ex: American Petroleum Institute standards, Mill Certifications, etc.).

The RAM team recognizes your equipment and reputation demands cylinders that meet your unique needs. Trust RAM to deliver the quality product and service you expect.

YORK WELDED SERIES

YORK Welded hydraulic cylinders are high-quality welded cylinders. Designed for performance, YORK welded cylinders have heavy duty pistons and piston stems. The internally threaded gland reduces the cross section and is easily removed for maintenance. YORK welded cylinders are well suited for light to medium duty applications.

STANDARD FEATURES

- | | |
|--|---|
| Intended Use: Double acting applications | Piston Material: Ductile iron 65-45-12 (ASTM A536) |
| Rated Pressure: 3000 PSI | Piston Locknut: High tensile grade C |
| Rod Material: High tensile SAE C1045, ground and polished hard chrome plated | Ports: SAE |
| Barrel Material: High tensile SAE C1026/St52.3 cold drawn tube precision honed for extended seal life | Port Plugs: High quality steel |
| Gland Material: Ductile iron 65-45-12 (ASTM A536) | Internal Seals: North American |
| | Paint Finish: 2 part urethane black |
| | Testing: 100% full cycle tested |

YORK CROSS TUBE



Bore Size (inches)	A	B	C	D	E	F	G	H	I	Ports
1.50	8.00	0.765	1.25	1.25	2.25	2.00	1.88	0.63	4.06	SAE-6
2.00	8.00	1.015	1.75	1.50	2.75	2.25	2.38	0.75	2.81	SAE-6
2.50	8.00	1.015	1.75	1.50	3.25	2.25	2.88	0.75	2.56	SAE-6
3.00	8.00	1.015	1.75	1.50	3.75	2.25	3.38	0.75	2.44	SAE-8
3.50	8.00	1.015	1.75	2.00	4.25	2.25	3.88	1.00	2.13	SAE-8
4.00	8.00	1.265	2.00	2.25	4.75	2.75	4.50	1.13	1.81	SAE-8

Measurements for A, B, C, D, E, F, G, H, I are in inches.

All specifications are subject to change without notice.

Bore Size (inches)	RAM Part Number	Stroke (inches)	Rod Diameter (inches)	Pin Center to Center (inches)		Ports	Pin Diameter Nominal (inches)	Maximum Rated Pressure & Column Load on Full Extension		Shipping Weight (lbs)
				Retracted	Extended			Pressure (PSI)	Load (lbf)	
1.50	R4507500	4	1.000	12	16	SAE-6	0.750	3000	5300	6
	R4507501	6		14	20					7
	R4507502	8		16	24					8
	R4507503	10		18	28					9
	R4507504	16		24	40					12
	R4507505	20		28	48					14
	R4507506	24		32	56					16
2.00	R4507507	4	1.250	12	16	SAE-6	1.000	3000	9425	10
	R4507508	6		14	20					12
	R4507509	8		16	24					13
	R4507510	10		18	28					14
	R4507511	12		20	32					16
	R4507512	14		22	36					17
	R4507513	16		24	40					19
	R4507514	18		26	44					20
	R4507515	20		28	48					21
	R4507516	24		32	56					24
	R4507517	30		38	68					29
	R4507518	32		40	72					30
	R4507519	36		44	80					33
	R4507520	40		48	88					36
	R4507521	48		56	104					42
2.50	R4507522	4	1.500	12	16	SAE-6	1.000	3000	14725	14
	R4507523	6		14	20					16
	R4507524	8		16	24					18
	R4507525	10		18	28					19
	R4507526	12		20	32					21
	R4507527	14		22	36					23
	R4507528	16		24	40					25
	R4507529	18		26	44					27
	R4507530	20		28	48					29
	R4507531	24		32	56					33
	R4507532	30		38	68					39
	R4507533	32		40	72					40
	R4507534	36		44	80					44
	R4507535	40		48	88					48
	R4507536	48		56	104					56

All specifications are subject to change without notice.
All weights are approximate shipping weights.

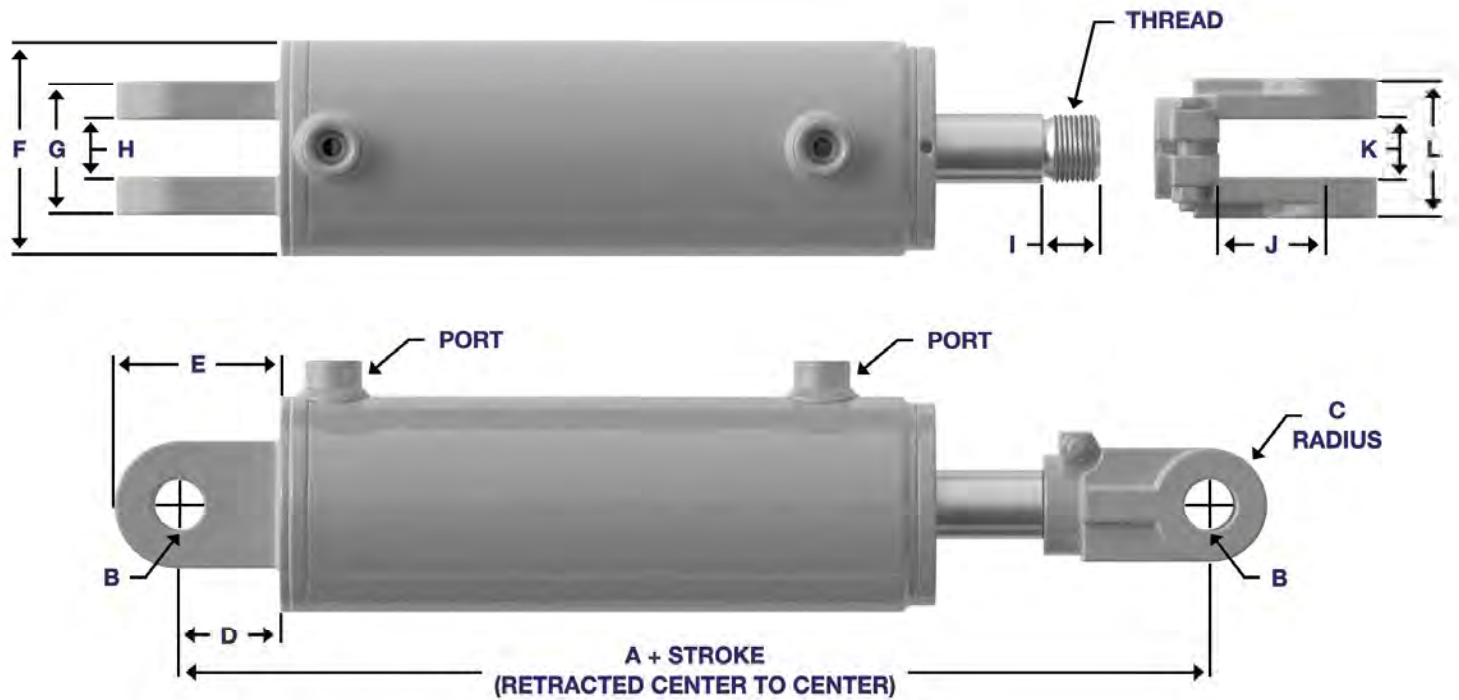
Bore Size (inches)	RAM Part Number	Stroke (inches)	Rod Diameter (inches)	Pin Center to Center (inches)		Ports	Pin Diameter Nominal (inches)	Maximum Rated Pressure & Column Load on Full Extension		Shipping Weight (lbs)
				Retracted	Extended			Pressure (PSI)	Load (lbf)	
3.00	R4507537	4	1.500	12	16	SAE-8	1.000	3000	21205	17
	R4507538	6		14	20					19
	R4507539	8		16	24					21
	R4507540	10		18	28					23
	R4507541	12		20	32					26
	R4507542	14		22	36					28
	R4507543	16		24	40					30
	R4507544	18		26	44					32
	R4507545	20		28	48			34		
	R4507546	24		32	56			38		
	R4507547	30		38	68			44		
	R4507548	32		40	72			46		
	R4507549	36		44	80			50		
	R4507550	40		48	88			55		
R4507551	48	56	104	63						
3.50	R4507552	4	1.750	12	16	SAE-8	1.000	3000	28860	24
	R4507553	6		14	20					26
	R4507554	8		16	24					29
	R4507555	10		18	28					31
	R4507556	12		20	32					34
	R4507557	14		22	36					37
	R4507558	16		24	40					39
	R4507559	18		26	44					42
	R4507560	20		28	48			44		
	R4507561	24		32	56			50		
	R4507562	30		38	68			57		
	R4507563	32		40	72			60		
	R4507564	36		44	80			65		
	R4507565	40		48	88			70		
R4507566	48	56	104	80						
4.00	R4507567	4	2.000	12	16	SAE-8	1.250	3000	37700	32
	R4507568	6		14	20					35
	R4507569	8		16	24					39
	R4507570	10		18	28					43
	R4507571	12		20	32					47
	R4507572	14		22	36					50
	R4507573	16		24	40					54
	R4507574	18		26	44					58
	R4507575	20		28	48			62		
	R4507576	24		32	56			69		
	R4507577	30		38	68			80		
	R4507578	32		40	72			84		
	R4507579	36		44	80			91		
	R4507580	40		48	88			98		
R4507581	48	56	104	113						

*Conforms to ASAE (American Society of Agricultural Engineers) specifications.

All specifications are subject to change without notice.
All weights are approximate shipping weights.



YORK CLEVIS



Bore Size (inches)	A	B	C	D	E	F	G	H	I	J	K	L	Ports	Thread
2.00	10.25*	1.015	1.13	2.00	3.25	2.38	2.13	1.13	1.13	2.00	1.13	2.75	SAE-6	1.250 - 12UNF
2.50	10.25*	1.015	1.13	2.00	3.25	2.88	2.13	1.13	1.13	2.00	1.13	2.75	SAE-6	1.250 - 12UNF
3.00	10.25*	1.015	1.13	2.00	3.25	3.38	2.13	1.13	1.13	2.00	1.13	2.75	SAE-8	1.250 - 12UNF
3.50	10.25*	1.015	1.13	2.00	3.25	3.88	2.38	1.13	1.13	2.00	1.13	2.75	SAE-8	1.250 - 12UNF
4.00	10.25*	1.015	1.13	2.00	3.25	4.50	2.63	1.13	1.13	2.00	1.13	2.75	SAE-8	1.250 - 12UNF

Measurements for A, B, C, D, E, F, G, H, I, J, K, L are in inches.

* For the standard ASAE (8" stroke) cylinders this dimension is 12.25".
All specifications are subject to change without notice.

Bore Size (inches)	RAM Part Number	Stroke (inches)	Rod Diameter (inches)	Pin Center to Center (inches)		Ports	Pin Diameter Nominal (inches)	Maximum Rated Pressure & Column Load on Full Extension		Shipping Weight (lbs)
				Retracted	Extended			Pressure (PSI)	Load (lbf)	
2.00	R4507600	4	1.250	14.25	18.25	SAE-6	1.000	3000	9425	13
	R4507601	6		16.25	22.25					14
	R4507602*	8		20.25	28.25					16
	R4507603	10		20.25	30.25					17
	R4507604	12		22.25	34.25					18
	R4507605	14		24.25	38.25					20
	R4507606	16		26.25	42.25			21		
	R4507607	18		28.25	46.25			23		
	R4507608	20		30.25	50.25			24		
	R4507609	24		34.25	58.25			27		
	R4507610	30		40.25	70.25			31		
	R4507611	32		42.25	74.25			33		
	R4507612	36		46.25	82.25			35		
	R4507613	40		50.25	90.25			38		
R4507614	48	58.25	106.25	44						
2.50	R4507615	4	1.500	14.25	18.25	SAE-6	1.000	3000	14725	16
	R4507616	6		16.25	22.25					18
	R4507617*	8		20.25	28.25					20
	R4507618	10		20.25	30.25					21
	R4507619	12		22.25	34.25					23
	R4507620	14		24.25	38.25					26
	R4507621	16		26.25	42.25			27		
	R4507622	18		28.25	46.25			29		
	R4507623	20		30.25	50.25			31		
	R4507624	24		34.25	58.25			35		
	R4507625	30		40.25	70.25			41		
	R4507626	32		42.25	74.25			42		
	R4507627	36		46.25	82.25			46		
	R4507628	40		50.25	90.25			50		
	R4507629	48		58.25	106.25			58		

*Conforms to ASAE (American Society of Agricultural Engineers) specifications.

All specifications are subject to change without notice.

RAM York Cylinder Components			
Size	Item	RAM Part Number	Shipping Weight (lbs)
Fits 1 1/4" Shaft	Shaft Clevis	R7600455	3.30
Fits 1 1/2" Shaft	Shaft Clevis	R7600455	3.30
Fits 1 3/4" Shaft	Shaft Clevis	R7600455	3.30
Fits 2" Shaft	Shaft Clevis	R7600455	3.30
1" x 2 7/8"	Pin	R3006631	0.80
1" x 2 1/4"	Pin	R3006632	0.60
Hairpin Clip	Clip	R3006300	0.02

All specifications are subject to change without notice.
All weights are approximate shipping weights.

RAM York Cylinder Seal Kits		
Bore Size (inches)	RAM Part Number	Rod Diameter (inches)
1.50	R3607500	1.000
2.00	R3607507	1.250
2.50	R3607522	1.500
3.00	R3607537	1.500
3.50	R3607552	1.750
4.00	R3607567	2.000

All specifications are subject to change without notice.
All weights are approximate shipping weights.



Bore Size (inches)	RAM Part Number	Stroke (inches)	Rod Diameter (inches)	Pin Center to Center (inches)		Ports	Pin Diameter Nominal (inches)	Maximum Rated Pressure & Column Load on Full Extension		Shipping Weight (lbs)
				Retracted	Extended			Pressure (PSI)	Load (lbf)	
3.00	R4507630	4	1.500	14.25	18.25	SAE-8	1.000	3000	21205	19
	R4507631	6		16.25	22.25					21
	R4507632*	8		20.25	28.25					24
	R4507633	10		20.25	30.25					25
	R4507634	12		22.25	34.25					27
	R4507635	14		24.25	38.25					29
	R4507636	16		26.25	42.25					31
	R4507637	18		28.25	46.25					33
	R4507638	20		30.25	50.25					35
	R4507639	24		34.25	58.25					40
	R4507640	30		40.25	70.25					46
	R4507641	32		42.25	74.25					48
	R4507642	36		46.25	82.25					52
	R4507643	40		50.25	90.25					56
R4507644	48	58.25	106.25	64						
3.50	R4507645	4	1.750	14.25	18.25	SAE-8	1.000	3000	28860	23
	R4507646	6		16.25	22.25					26
	R4507647*	8		20.25	28.25					30
	R4507648	10		20.25	30.25					31
	R4507649	12		22.25	34.25					34
	R4507650	14		24.25	38.25					36
	R4507651	16		26.25	42.25					39
	R4507652	18		28.25	46.25					41
	R4507653	20		30.25	50.25					44
	R4507654	24		34.25	58.25					49
	R4507655	30		40.25	70.25					57
	R4507656	32		42.25	74.25					60
	R4507657	36		46.25	82.25					65
	R4507658	40		50.25	90.25					70
R4507659	48	58.25	106.25	80						
4.00	R4507660	4	2.000	14.25	18.25	SAE-8	1.000	3000	37700	30
	R4507661	6		16.25	22.25					33
	R4507662*	8		20.25	28.25					39
	R4507663	10		20.25	30.25					41
	R4507664	12		22.25	34.25					45
	R4507665	14		24.25	38.25					48
	R4507666	16		26.25	42.25					52
	R4507667	18		28.25	46.25					56
	R4507668	20		30.25	50.25					59
	R4507669	24		34.25	58.25					67
	R4507670	30		40.25	70.25					78
	R4507671	32		42.25	74.25					82
	R4507672	36		46.25	82.25					89
	R4507673	40		50.25	90.25					96
R4507674	48	58.25	106.25	111						

*Conforms to ASAE (American Society of Agricultural Engineers) specifications.

All specifications are subject to change without notice.
All weights are approximate shipping weights.

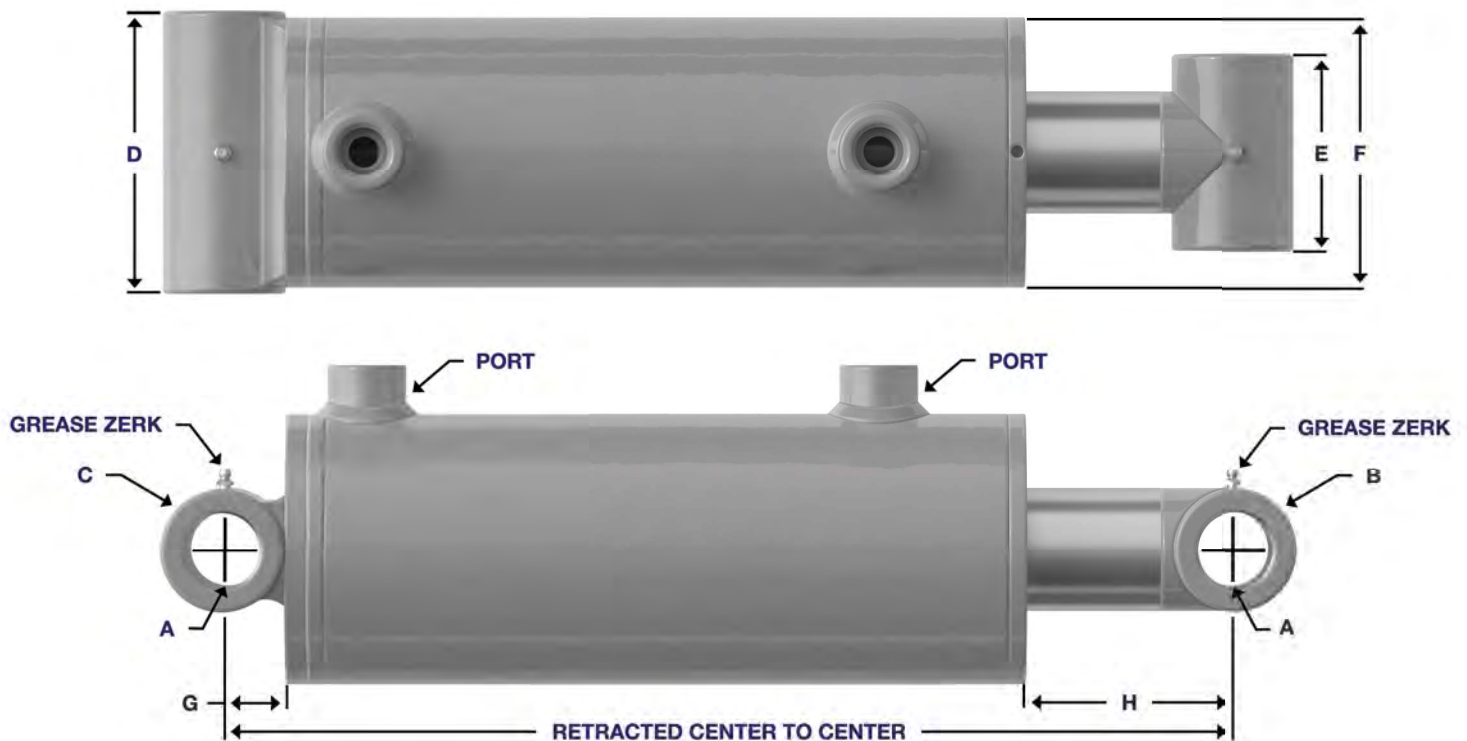


HEAVY DUTY YORK - CROSS TUBE

RAM YORK Heavy Duty Cross Tube is a high quality welded cylinder designed for heavy loads and extreme duty. The rod and base ends are welded cross tubes with grease zerks. Designed to last, this cylinder has a heavy duty piston with high pressure seal and wear ring and a over sized piston stem. The internally threaded gland reduces the cross section and features wear rings to reduce friction and increase rod support. The gland is easily removed for maintenance. YORK Heavy Duty cylinders are well suited for equipment in construction, agricultural, oil and gas sector, waste/recycling and transportation.

STANDARD FEATURES

Intended Use:	Double acting applications	Piston Locknut:	High tensile grade C
Rated Pressure:	3000 PSI	End Mounts:	Cross tube
Rod Material:	High tensile SAE C1045, ground and polished hard chrome plated	Ports:	SAE
Barrel Material:	High tensile SAE C1026/St52.3 cold drawn tube precision honed for extended seal life	Port Plugs:	High quality steel
Gland Material:	Ductile iron 65-45-12 (ASTM A536)	Internal Seals:	North American
Piston Material:	Ductile iron 65-45-12 (ASTM A536)	Paint Finish:	2 part urethane black
		Testing:	100% full cycle tested



Bore Size (inches)	A	B	C	D	E	F	G	H	Ports
5.00	1,515	2,50	2,50	5,75	4,00	5,50	1,25	2,75	SAE-12
6.00	1,515	2,50	2,50	6,75	4,00	6,50	1,25	2,75	SAE-12
8.00	2,515	4,00	4,00	9,00	5,00	8,75	2,00	3,50	SAE-16

Measurements for A, B, C, D, E, F, G, H are in inches.

All Specifications are subject to change without notice.

Bore Size (inches)	RAM Part Number	Stroke (inches)	Rod Diameter (inches)	Pin Center to Center (inches)		Ports	Pin Diameter Nominal (inches)	Maximum Rated Pressure & Column Load on Full Extension		Shipping Weight (lbs)
				Retracted	Extended			Pressure (PSI)	Load (lbf)	
5.00	R4508545	8	2.500	19	27	SAE-12	1.500	3000	58900	68
	R4508546	12		23	35					79
	R4508547	16		27	43					89
	R4508548	20		31	51					99
	R4508549	24		35	59					109
	R4508550	30		41	71					124
	R4508551	36		47	83			140		
	R4508552	48		61	109			178		
	R4508553	54		68	122			197		
	R4508554	60		75	135			217		
6.00	R4508555	8	3.000	19	27	SAE-12	1.500	3000	84823	88
	R4508556	12		23	35					101
	R4508557	16		27	43					115
	R4508558	20		31	51					128
	R4508559	24		35	59					142
	R4508560	30		41	71					163
	R4508561	36		47	83			183		
	R4508562	48		61	109			234		
	R4508563	54		68	122			259		
	R4508564	60		75	135			285		
8.00	R4508796	8	4.000	24	32	SAE-16	2.500	3000	150795	250
	R4508797	12		28	40					275
	R4508798	16		32	48					300
	R4508799	20		36	56					325
	R4508800	24		40	64					350
	R4508801	30		46	76					385
	R4508802	36		52	88					425
	R4508803	48		66	114					500
	R4508804	54		73	127					540
	R4508805	60		80	140					580

All specifications are subject to change without notice.
All weights are approximate shipping weights.

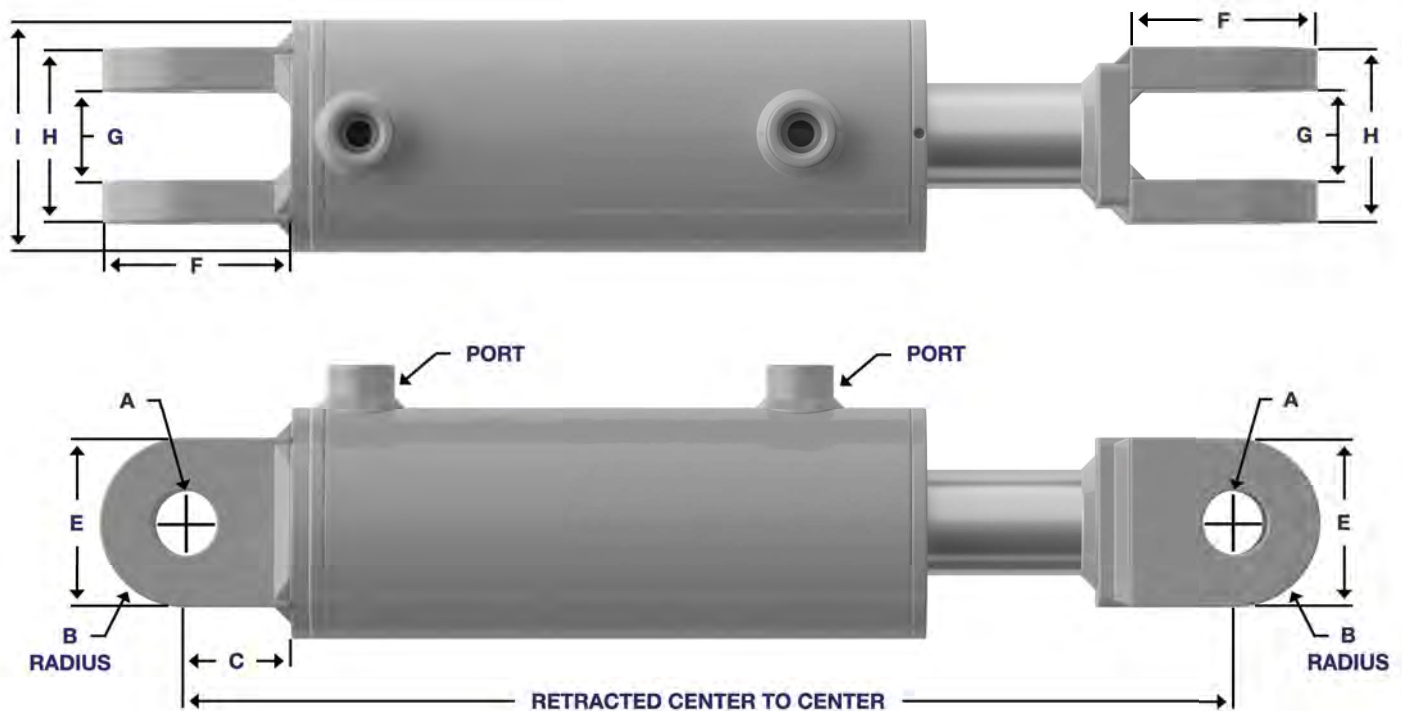


HEAVY DUTY YORK - CLEVIS

RAM YORK Heavy Duty Clevis is a high quality welded cylinder designed for heavy loads and extreme duty. The rod and base ends are welded high strength steel clevises. Designed to last, this cylinder has a heavy duty piston with high pressure seal and wear ring and an over sized piston stem. The internally threaded gland reduces the cross section and features wear rings to reduce friction and increase rod support. The gland is easily removed for maintenance. YORK Heavy Duty cylinders are well suited for equipment in construction, agricultural, oil and gas sector, waste/recycling and transportation.

STANDARD FEATURES

Intended Use:	Double acting applications	Piston Material:	Ductile iron 65-45-12 (ASTM A536)
Rated Pressure:	3000 PSI	Piston Locknut:	High tensile grade C
Rod Material:	High tensile SAE C1045, ground and polished hard chrome plated	End Mounts:	Clevis
Barrel Material:	High tensile SAE C1026/St52.3 cold drawn tube precision honed for extended seal life	Ports:	SAE
Gland Material:	Ductile iron 65-45-12 (ASTM A536)	Port Plugs:	High quality steel
		Internal Seals:	North American
		Paint Finish:	2 part urethane black
		Testing:	100% full cycle tested



Bore Size (inches)	A	B	C	D	E	F	G	H	I	Ports
5.00	1.515	2.00	2.50	4.50	4.00	4.50	2.13	4.13	5.50	SAE-12
6.00	1.515	2.00	2.50	4.50	4.00	4.50	2.13	4.13	6.50	SAE-12
8.00	2.515	3.00	3.50	6.00	6.00	6.50	3.13	6.13	8.75	SAE-16

Measurements for A, B, C, D, E, F, G, H, I are in inches.

All specifications are subject to change without notice.

Bore Size (inches)	RAM Part Number	Stroke (inches)	Rod Diameter (inches)	Pin Center to Center (inches)		Ports	Pin Diameter Nominal (inches)	Maximum Rated Pressure & Column Load on Full		Shipping Weight (lbs)								
				Retracted	Extended			Pressure (PSI)	Load (lbf)									
5.00	R4509389	8	2.500	22	30	SAE-12	1.500	3000	58900	87								
	R4509390	12		26	38						98							
	R4509391	16		30	46							108						
	R4509392	20		45	65								118					
	R4509393	24		38	62									128				
	R4509394	30		44	74										143			
	R4509395	36		50	86											159		
	R4509396	48		64	112												197	
	R4509397	54		71	125			216										
	R4509398	60		78	138				236									
6.00	R4509399	8	3.000	22	30	SAE-12	1.500	3000	84823	107								
	R4509400	12		26	38						120							
	R4509401	16		30	46							134						
	R4509403	20		45	65								147					
	R4509404	24		38	62									161				
	R4509405	30		44	74										182			
	R4509406	36		50	86											202		
	R4509407	48		64	112												253	
	R4509408	54		71	125			278										
	R4509409	60		78	138				304									
8.00	R4509410	8	4.000	28	36	SAE-16	2.500	3000	150795	299								
	R4509411	12		32	44						324							
	R4509412	16		36	52							349						
	R4509413	20		40	60								374					
	R4509414	24		44	68									399				
	R4509415	30		50	80										434			
	R4509416	36		56	92											474		
	R4509417	48		70	118												549	
	R4509418	54		77	131													589
	R4509419	60		84	144													

All specifications are subject to change without notice.
All weights are approximate shipping weights.



STABILIZER

RAM Mechanical Locking Stabilizer cylinders replace manual systems used to position equipment at a desired location and height. Traditional methods to secure equipment are the use of crank type trailer jacks, manual jacking and blocking systems, or the use of fixed hydraulic lifting jacks and wood blocking to set equipment in place.

The primary advantages of replacing these manual methods of stabilizing equipment with a RAM Mechanical Locking Stabilizer cylinder are operator ease, speed, and accuracy. These unique cylinders provide infinite adjustments over a long range which means operators can more quickly and precisely set equipment in the field before use. Furthermore, the positive locking feature provides greater assurance there will be no creeping from the desired settings.

RAM offers a standard, pre-engineered line up of Mechanical Locking Stabilizer cylinders in Standard and Ball End designs for quick order turnaround. Each model includes a wide range of standard features to accommodate many OEM applications.

Standard Stabilizer cylinder sizes range in bore diameters from 4" to 6", and stroke lengths from 12" to 30".

All standard RAM Stabilizer cylinders are pressure rated up to 3000 PSI. Every RAM Stabilizer cylinder model features an external adjustable solid or split ring mechanism that locks the Stabilizer in position and eliminates the need for manual blocking.

RAM Mechanical Locking Stabilizer cylinders are commonly used for levelling and outrigger applications, such as:

Aggregate:

- Crushers
- Screen decks
- Conveyors
- Grizzlies, etc.

Trailers used for fixed location deployment:

- Mobile radar
- Communication towers
- Observation trailers, etc.

Oil and Gas Sector:

- Service rigs
- Coiled tubing rigs
- Drilling rigs
- Catwalks
- Pipe ruls, etc.

Mobile Cranes:

- Commercial and industrial crane applications



STANDARD FEATURES

Intended Use: Leveling and outrigger applications
Rated Pressure: 3000 PSI
Rod Material: High tensile SAE C1026/St2.3 DOM, hard chrome plated
Barrel Material: High tensile SAE C1026/St52.3 cold drawn tube precision honed for extended seal life
Gland Material: Ductile iron 65-45-12 (ASTM A536)
Piston Material: Ductile iron 65-45-12 (ASTM A536)

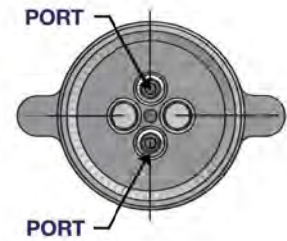
Piston Locknut: High tensile grade C
Locking Nut: 44W steel
Locking Thread: 4 TPI acme
Ports: NPTF
Port Plugs: High quality steel
Internal Seals: North American
Paint Finish: 2 part urethane black
Testing: 100% full cycle tested

BUILT TO YOUR SPECIFICATIONS

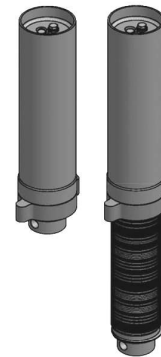
- Ball end mounts
- Solid locking nut
- Split locking nut
- Jacking pad
- Custom mounts
- Internal pilot operated check valve
- Internal counterbalance valve
- ORB ports
- Side ports
- Custom stroke length



STANDARD STABILIZER SOLID LOCKING NUT



Bore Size (inches)	A	B	C	D	E	F	Ports	Thread
4.00	13.25	1.28	3.50	1.25	2.50	5.50	1/4 NPTF	5.00-4 ACME 2G
5.00	13.25	1.28	4.50	1.25	2.50	6.75	1/4 NPTF	6.00-4 ACME 2G
6.00	13.25	1.28	4.50	1.25	2.50	8.00	1/4 NPTF	7.00-4 ACME 2G



Measurements for A, B, C, D, E, F are in inches.

All specifications are subject to change without notice.

Bore Size (inches)	RAM Part Number	Stroke (inches)	Rod Diameter (inches)	Overall Length (inches)		Ports	Pin Diameter Nominal (inches)	Cylinder Push* (lbf)	Maximum Load** (lbf)	Shipping Weight (lbs)
				Retracted	Extended					
4.00	R4507400	12.00	3.500	25.25	37.25	1/4 NPTF	1.250	37700	129000	104
	R4506811	14.75		28.00	42.75					114
	R4507402	20.00		33.25	53.25					133
	R4507404	24.00		37.25	61.25					148
	R4507406	30.00		43.25	73.25					169
5.00	R4507408	12.00	3.500	25.25	37.25	1/4 NPTF	1.250	58900	156100	140
	R4506812	14.75		28.00	42.75					153
	R4507319	20.00		33.25	53.25					177
	R4507410	24.00		37.25	61.25					195
	R4507412	30.00		43.25	73.25					222
6.00	R4507414	12.00	4.500	25.25	37.25	1/4 NPTF	1.250	84800	212800	216
	R4506813	14.75		28.00	42.75					235
	R4507416	20.00		33.25	53.25					272
	R4506931	24.00		37.25	61.25					300
	R4507418	30.00		43.25	73.25					341

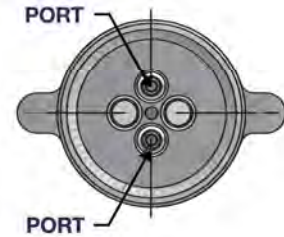
* Cylinder push is calculated at the design pressure of 3000 PSI.

** Maximum Load is based on a SF of 2, and is applicable when the stabilizer is in the locked position.

All specifications are subject to change without notice.

All weights are approximate shipping weights.

STANDARD STABILIZER SPLIT LOCKING NUT



Bore Size (inches)	A	B	C	D	E	F	Ports	Thread
4.00	13.25	1.28	3.50	1.25	2.50	5.50	1/4 NPTF	5.00-4 ACME 2G
5.00	13.25	1.28	4.50	1.25	2.50	6.75	1/4 NPTF	6.00-4 ACME 2G
6.00	13.25	1.28	4.50	1.25	2.50	8.00	1/4 NPTF	7.00-4 ACME 2G

Measurements for A, B, C, D, E, F are in inches.

All specifications are subject to change without notice.

Bore Size (inches)	RAM Part Number	Stroke (inches)	Rod Diameter (inches)	Overall Length (inches)		Ports	Pin Diameter Nominal (inches)	Cylinder Push* (lbf)	Maximum Load** (lbf)	Shipping Weight (lbs)
				Retracted	Extended					
4.00	R4507420	12.00	3.500	25.25	37.25	1/4 NPTF	1.250	37700	129000	104
	R4507421	14.75		28.00	42.75					114
	R4507422	20.00		33.25	53.25					133
	R4507423	24.00		37.25	61.25					148
	R4507424	30.00		43.25	73.25					169
5.00	R4507425	12.00	3.500	25.25	37.25	1/4 NPTF	1.250	58900	156100	140
	R4507426	14.75		28.00	42.75					153
	R4507427	20.00		33.25	53.25					177
	R4507428	24.00		37.25	61.25					195
	R4507429	30.00		43.25	73.25					222
6.00	R4507430	12.00	4.500	25.25	37.25	1/4 NPTF	1.250	84800	212800	216
	R4507431	14.25		28.00	42.75					235
	R4507432	20.00		33.25	53.25					272
	R4507433	24.00		37.25	61.25					300
	R4507434	30.00		43.25	73.25					341

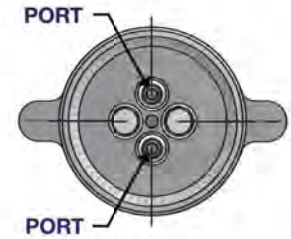
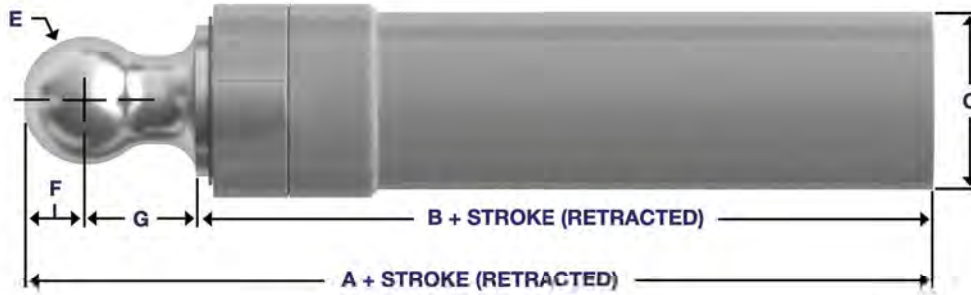
* Cylinder push is calculated at the design pressure of 3000 PSI.

** Maximum Load is based on a SF of 2, and is applicable when the stabilizer is in the locked position.

All specifications are subject to change without notice.

All weights are approximate shipping weights.

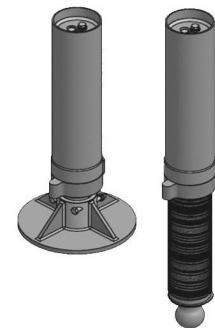
BALL END STABILIZER SOLID LOCKING NUT



Bore Size (inches)	A	B	C	D	E	F	G	H	Ports	Thread
4.00	14.88	10.75	5.50	3.63	4.00	1.30	2.00	12.00	1/4 NPTF	5.00-4 ACME 2G
5.00	17.50	10.75	6.75	5.75	4.00	1.93	3.38	16.00	1/4 NPTF	6.00-4 ACME 2G
6.00	17.50	10.75	8.00	5.75	4.00	1.93	3.38	16.00	1/4 NPTF	7.00-4 ACME 2G

Measurements for A, B, C, D, E, F, G, H are in inches.

All specifications are subject to change without notice.



Bore Size (inches)	RAM Part Number	Stroke (inches)	Rod Diameter (inches)	Overall Length (inches)		Ports	Pin Diameter Nominal (inches)	Cylinder Push* (lbf)	Maximum Load** (lbf)	Shipping Weight (lbs)
				Retracted	Extended					
4.00	R4507700	12.00	3.500	28.38	40.38	1/4 NPTF	4.000	37700	129000	128
	R4507701	14.75		30.81	45.56					138
	R4507702	20.00		40.06	56.06					157
	R4507703	24.00		46.05	64.06					172
	R4507704	30.00		44.88	76.05					193
5.00	R4507705	12.00	3.500	28.06	40.06	1/4 NPTF	4.000	58900	156100	214
	R4506903	14.75		30.81	45.56					226
	R4507206	20.00		36.06	56.06					251
	R4507706	24.00		40.06	64.06					269
	R4507707	30.00		46.05	76.05					296
6.00	R4507708	12.00	4.500	28.06	40.06	1/4 NPTF	4.000	84800	212800	290
	R4507709	14.75		30.81	45.56					309
	R4507710	20.00		36.06	56.06					345
	R4507711	24.00		40.06	64.06					374
	R4507712	30.00		46.05	76.05					415

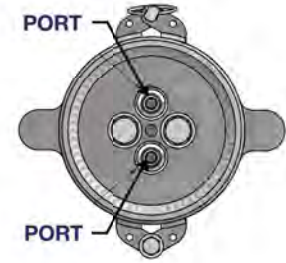
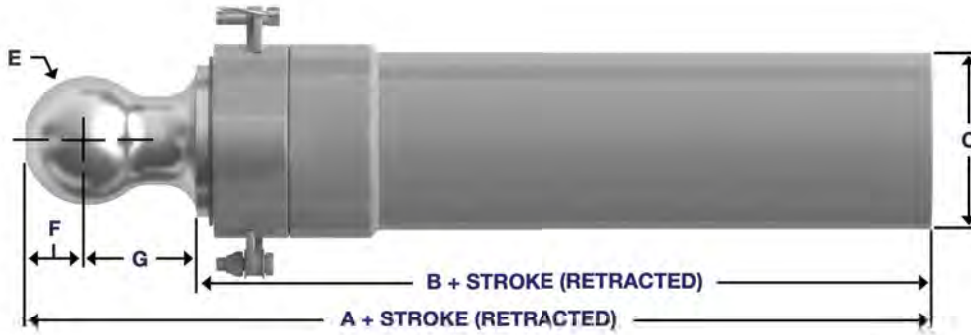
* Cylinder push is calculated at the design pressure of 3000 PSI.

** Maximum Load is based on a SF of 2, and is applicable when the stabilizer is in the locked position.

All specifications are subject to change without notice.

All weights are approximate shipping weights.

BALL END STABILIZER SPLIT LOCKING NUT



Bore Size (inches)	A	B	C	D	E	F	G	H	Ports	Thread
4.00	14.88	10.75	5.50	3.63	4.00	1.30	2.00	12.00	1/4 NPTF	5.00-4 ACME 2G
5.00	17.50	10.75	6.75	5.75	4.00	1.93	3.38	16.00	1/4 NPTF	6.00-4 ACME 2G
6.00	17.50	10.75	8.00	5.75	4.00	1.93	3.38	16.00	1/4 NPTF	7.00-4 ACME 2G

Measurements for A, B, C, D, E, F, G, H are in inches.

All specifications are subject to change without notice.

Bore Size (inches)	RAM Part Number	Stroke (inches)	Rod Diameter (inches)	Overall Length (inches)		Ports	Pin Diameter Nominal (inches)	Cylinder Push* (lbf)	Maximum Load** (lbf)	Shipping Weight (lbs)
				Retracted	Extended					
4.00	R4507713	12.00	3.500	28.38	40.38	1/4 NPTF	4.000	37700	129000	128
	R4507714	14.75		30.81	45.56					138
	R4507715	20.00		40.06	56.06					157
	R4507716	24.00		46.05	64.06					172
	R4507717	30.00		44.88	76.05					193
5.00	R4507718	12.00	3.500	28.06	40.06	1/4 NPTF	4.000	58900	156100	214
	R4507719	14.75		30.81	45.56					226
	R4507720	20.00		36.06	56.06					251
	R4507721	24.00		40.06	64.06					269
	R4507722	30.00		46.05	76.05					296
6.00	R4507723	12.00	4.500	28.06	40.06	1/4 NPTF	4.000	84800	212800	290
	R4507724	14.25		30.81	45.56					309
	R4507725	20.00		36.06	56.06					345
	R4507726	24.00		40.06	64.06					374
	R4507727	30.00		46.05	76.05					415

* Cylinder push is calculated at the design pressure of 3000 PSI.

** Maximum Load is based on a SF of 2, and is applicable when the stabilizer is in the locked position.

All specifications are subject to change without notice.

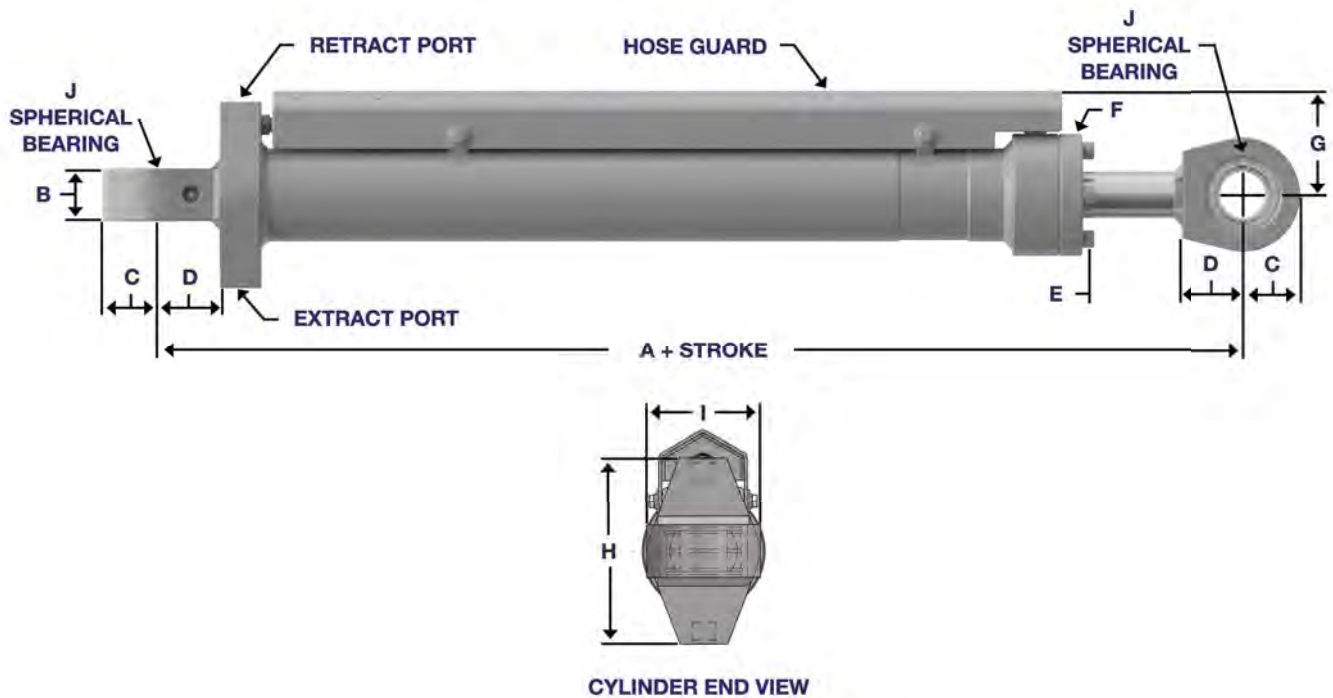
All weights are approximate shipping weights.

THUMB CYLINDERS

RAM Thumb cylinders are high quality welded cylinders. They are specifically designed for hydraulic thumb applications used on mini excavators, tracked excavators, wheeled excavators and backhoes.

The Thumb cylinder design offers many unique features to protect the cylinder and equipment when operating in rugged working conditions. The Thumb cylinder's construction was specifically designed to ensure a long working life, while simplifying any routine servicing requirements in the shop or on the job site. Standard features include:

- Steel guarded transfer hose
- Oversized spherical bearing mounts
- Custom seal package that includes wear rings and high pressure seals
- CAT style heavy duty nut
- Oversized piston stem
- Fixed cushions on both cylinder ends
- Bolt in gland with high tensile head bolts



Bore Size (inches)	A	B	C	D	E	F	G	H	I	J	Rod Diameter (inches)	Ports
3.00	11.50	1.75	2.00	2.25	0.75	4.38	4.81	7.00	4.25	1.50	1.75	SAE-8
3.50	13.00	2.25	2.44	2.63	0.75	5.25	5.19	8.00	4.75	2.00	2.00	SAE-12

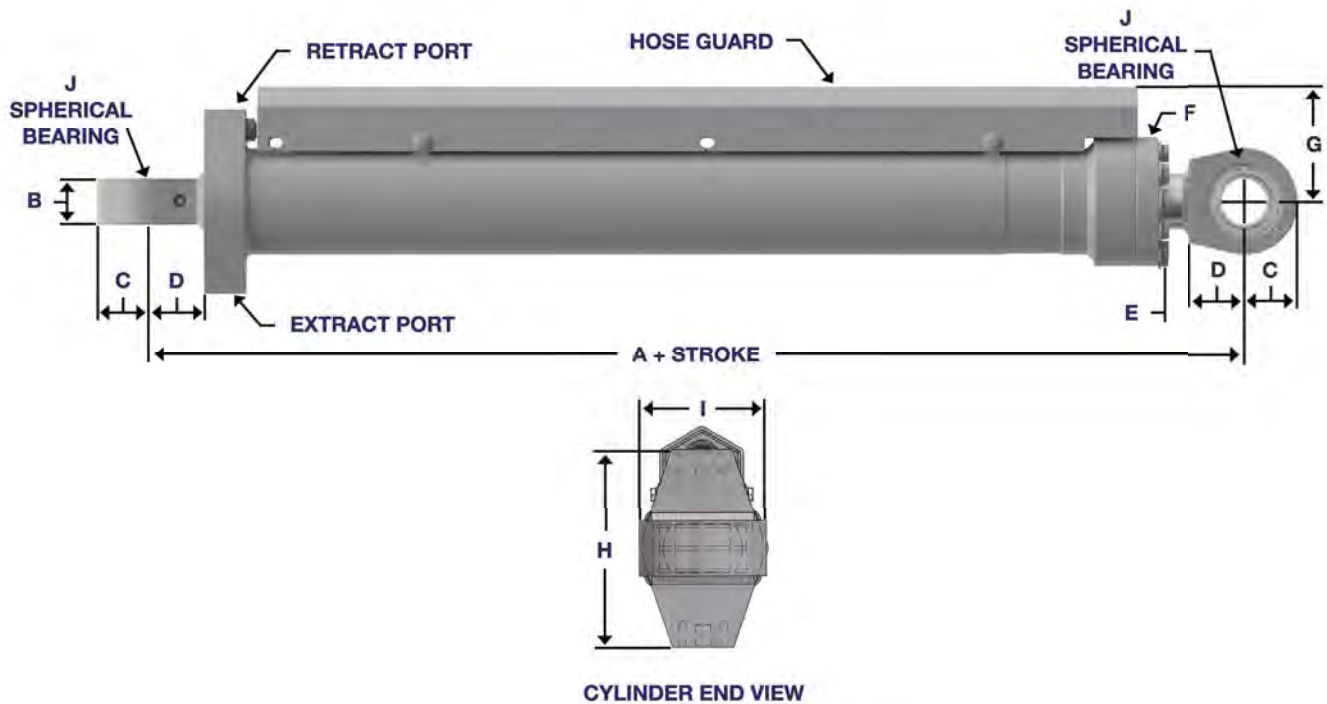
Measurements for A, B, C, D, E, F, G, H, I, J are in inches.

All specifications are subject to change without notice.

STANDARD FEATURES

Intended Use: Double acting applications
Rod Material: High tensile SAE C1045 induction hardened, ground and polished hard chrome plated
Barrel Material: High tensile SAE C1026/St52.3 cold drawn tube precision honed for extended seal life
Gland Material: Ductile iron 65-45-12 (ASTM A536)

Piston Material: Ductile iron 65-45-12 (ASTM A536)
Piston Locknut: CAT style high tensile grade C
End Mounts: Tangs with spherical bearing
Ports: SAE Code 61
Port Plugs: High quality steel
Internal Seals: North American
Paint Finish: 2 part urethane black
Testing: 100% full cycle tested



Bore Size (inches)	A	B	C	D	E	F	G	H	I	J	Rod Diameter (inches)	Ports
4.00	15.00	2.50	2.88	3.00	1.38	5.75	5.50	9.00	5.50	2.50	2.50	#12 (3/4) CODE 61
5.00	15.25	2.50	2.88	3.00	1.38	7.00	6.25	10.00	6.50	2.50	3.00	#12 (3/4) CODE 61

Measurements for A, B, C, D, E, F, G, H, I, J are in inches.

All specifications are subject to change without notice.

BIG BORE

RAM Big Bore cylinders achieve the power and pressure required for your equipment to move the heaviest loads. RAM Big Bore cylinders are heavy-duty, robust and often necessary for machinery that operates in tough working environments. With bore sizes from 10 inches up to 18 inches, RAM's Big Bore cylinders are up to the task!

The bore size, along with the desired operating pressure of the cylinder, determines the force output available. The bigger the bore, more force the cylinder can develop. Knowing the load your application needs to move and the hydraulic system pressure rating, will help determine the optimal bore size of your cylinders. With the increased cylinder size, the experts at RAM take every precaution to recommend internal componentry that will meet the performance requirements and the external operating conditions. Our priority is developing complete cylinder solutions that produce quality performance.

RAM is well-versed in the latest technologies in materials, cylinder componentry, cylinder design and manufacturing methods to ensure your cylinder functions exactly as required. RAM Big Bore cylinder designs can be customized specific to your application requirements. These cylinders are built to accommodate rough and rugged work environments and frequently need bolted construction to provide additional strength and easy serviceability.

Customized options include:

- High strength materials such as 4140, QT100, AR (Abrasion Resistant) and other high-yield strength carbon and alloy steels
- Increased shaft protection through induction hardened rods, thicker chrome, chrome over nickel and other material alternatives
- Leading edge large bore seal technologies for heavy duty use, high wear environments, and abrasion resistance
- Expanded seal sets to resist shock pressures
- Bellows for external shaft protection
- External guards for ports, hoses and oil lines
- Bolt in glands for added strength
- Hardened pins for added durability
- High pressure ports (SAE Code 61/62 4 bolt flange designs)
- Integrated valves (relief, counterbalance or PO check) to protect the cylinder, maintain position, and control the rate of extension and retraction to counteract external forces.

STANDARD FEATURES

Intended Use: Double acting extension

Rated Pressure: Up to 3000 PSI

Rod Material: High tensile SAE C1026/St2.3 DOM, hard chrome plated

Barrel Material: High tensile SAE C1026/St52.3 cold drawn tube precision honed for extended seal life

Gland Material: High strength steel glands and stops (1045 Q&T)

Piston Material: Ductile iron 65-45-12 (ASTM A536)

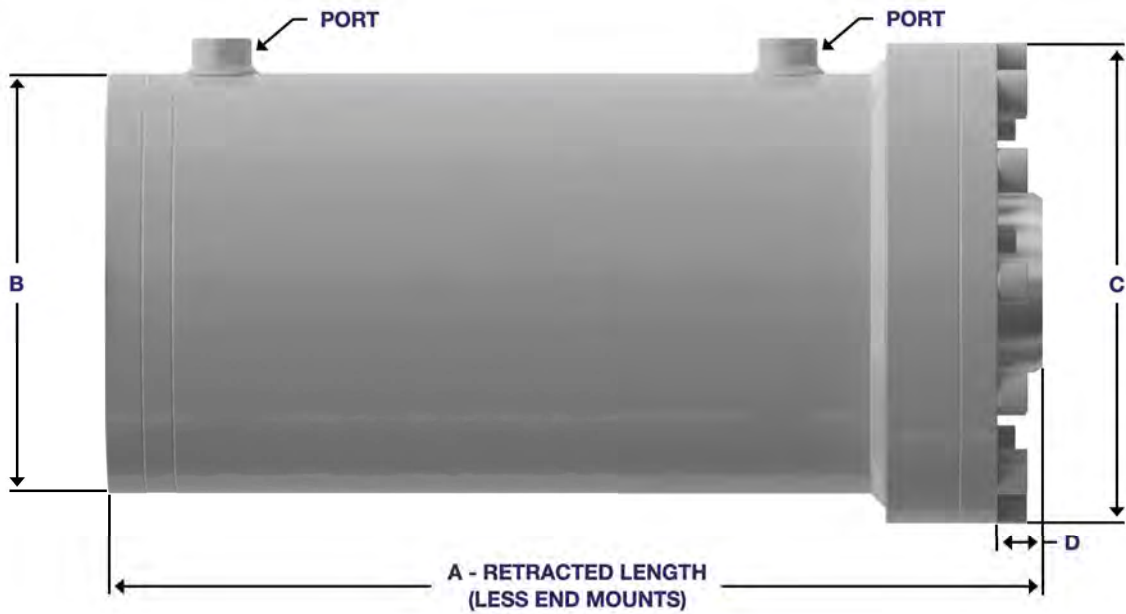
Ports: SAE standard; NPTF and Code 61/62 are also available

Port Plugs: High quality steel

Internal Seals: North American

Paint Finish: 2 part urethane black

Testing: 100% full cycle tested

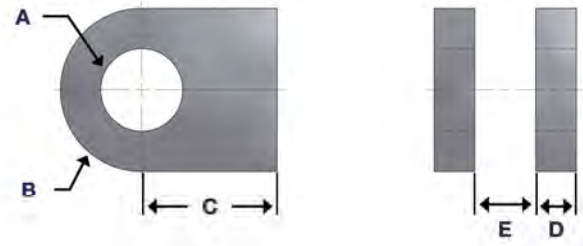
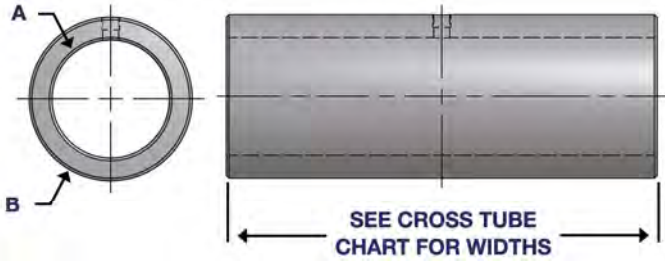


Bore (inches)	Rod Size	Extension Force at 3000 PSI (lbf)*	Retraction Force at 3000 PSI (lbf)*	Maximum Stroke	Retracted Length (No Mounts) A	B	C	D	Standard Ports
10.00	4.00	235,600	197,900	216	19.00 + Stroke	12.00	14.00	2.00	SAE-16
	5.00	235,600	176,700	216	19.00 + Stroke	12.00	14.00	2.00	SAE-16
	6.00	235,600	150,800	216	19.00 + Stroke	12.00	14.00	2.00	SAE-16
12.00	6.00	339,300	254,400	216	19.50 + Stroke	14.00	16.00	2.00	SAE-16
	7.00	339,300	223,800	216	19.50 + Stroke	14.00	16.00	2.00	SAE-16
	8.00	339,300	188,500	216	19.50 + Stroke	14.00	16.00	2.00	SAE-16
14.00	7.00	461,800	346,300	120	22.50 + Stroke	16.00	18.00	2.00	SAE-24
	8.00	461,800	311,000	120	22.50 + Stroke	16.00	18.00	2.00	SAE-24
	10.00	461,800	226,200	120	22.50 + Stroke	16.00	18.00	2.00	SAE-24
16.00	8.00	603,100	452,300	120	23.25 + Stroke	19.00	21.00	2.00	SAE-24
	9.00	603,100	412,300	120	23.25 + Stroke	19.00	21.00	2.00	SAE-24
	10.00	603,100	367,500	120	23.25 + Stroke	19.00	21.00	2.00	SAE-24
18.00	8.00	636,150*	510,500*	120	28.75 + Stroke	22.00	24.00	2.50	SAE-24
	9.00	636,150*	477,100*	120	28.75 + Stroke	22.00	24.00	2.50	SAE-24
	10.00	636,150*	439,800*	120	28.75 + Stroke	22.00	24.00	2.50	SAE-24

*note 18" bore cylinder is rated at 2500 PSI

All specifications are subject to change without notice

STANDARD MOUNTS



Cross Tube				
Bore	A	B	Width (Base)	Width (Rod)
10.00	3.53	5.50	12.50	8.00
12.00	4.03	6.00	14.50	10.00
14.00	5.03	8.00	16.50	10.00
16.00	6.03	9.50	19.50	12.00
18.00	6.53	10.00	22.50	14.00

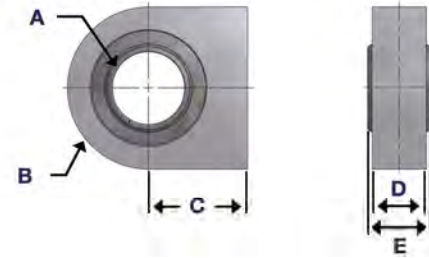
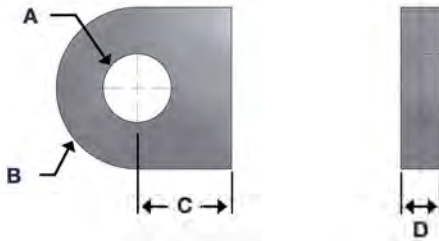
*All measurements are in inches

All specifications subject to change without notice

Clevis					
Bore	A	B	C	D	E
10.00	3.53	3.50	4.00	2.00	4.00
12.00	4.03	4.00	4.50	2.50	5.00
14.00	5.03	5.00	5.75	3.00	6.00
16.00	6.03	6.00	7.00	3.50	7.00
18.00	6.53	6.50	7.75	4.00	8.00

*All measurements are in inches

All specifications subject to change without notice



Tang				
Bore	A	B	C	D
10.00	3.53	3.50	4.00	4.00
12.00	4.03	4.00	4.50	5.00
14.00	5.03	5.00	5.75	6.00
16.00	6.03	6.00	7.00	7.00
18.00	6.53	6.50	7.75	8.00

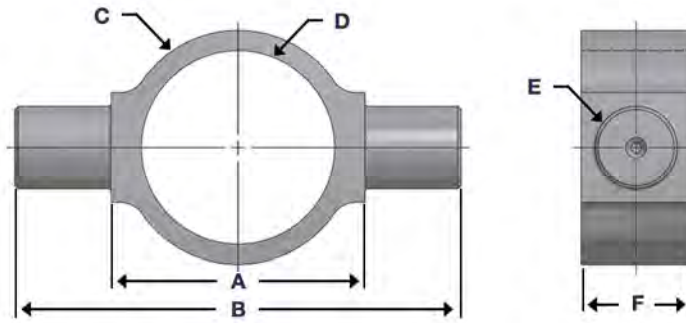
*All measurements are in inches

All specifications subject to change without notice

Tang with Bearing					
Bore	A	B	C	D	E
10.00	3.50	3.50	4.00	2.00	4.00
12.00	4.00	4.00	4.50	2.50	5.00
14.00	5.00	5.00	5.75	3.00	6.00
16.00	6.00	6.00	7.00	3.50	7.00
18.00	Consult Factory				

*All measurements are in inches

All specifications subject to change without notice



Trunnion						
Bore	A	B	C	D	E	F
10.00	3.50	14.00	15.00	10.00	3.500	4.00
12.00	4.00	16.00	17.00	12.00	4.000	4.50
14.00	4.50	18.00	19.00	14.00	4.500	5.00
16.00	Consult Factory					
18.00	Consult Factory					

*All measurements are in inches

All specifications subject to change without notice

MOUNT OPTIONS

In addition to standard mounting options, RAM will design and/or manufacture custom mounts in a wide array of styles and materials.

We can also offer unique mounting locations, including mid-barrel positioning for mounting flexibility.

Contact the RAM Engineering team today and let them help select the best option for your application.



CUSTOM HEAVY DUTY

RAM Heavy Duty cylinders are characterized as a robust cylinder design and are often necessary for machinery that operates in tough working environments. RAM understands the high demands placed on hydraulic cylinder performance in these rough and rugged conditions. These considerations include:

- Continuous cylinder cycling
- Heavy mechanical loads and weights
- Hot, cold, wet or dry operating conditions
- Equipment contact with earth, snow, salt, heavy/light, mixed or abrasive matter
- Higher operating pressures
- Frequency and magnitude of possible cylinder stress
- Fluid compatibility such as petroleum based, water based and fire resistant
- Environmental considerations through secondary sealing, containment and leak detection
- Field maintenance needs for cylinder accessibility, parts inter-changeability and easy teardown

The assessment of your equipment's operating environment is important, as RAM's expertise is in supplying cylinders that are specifically engineered for your application.

BUILT TO YOUR SPECIFICATIONS

Rated Pressure: Up to 5000 PSI	End Mounts: Trunnion, clevis, tang, cross tube, spherical bearing, custom bushing, flange, cross drilled holes
Rod Size: As required	Head Style: Bolt in flange type manufactured from ductile or steel
Rod Material: High tensile SAE C1045, ground and polished hard chrome plated	Ports: ORB, NPT, or Code 61 or 62 4-bolt flange
Barrel Size: As required	Port Plugs: High quality steel
Barrel Material: High tensile SAE C1026/St52.3 cold drawn tube precision honed for extended seal life	Internal Seals: North American
Gland Material: Ductile iron 65-45-12 (ASTM A536) or steel (AISI 1026)	Paint Finish: 2 part urethane black (or custom colors)
Piston Material: Ductile iron 65-45-12 (ASTM A536) or steel (AISI 1026)	Testing: 100% full cycle tested

A wide range of cylinder styles and sizes (bore & stroke) are available at RAM. We are well-versed in the latest technologies in materials, cylinder componentry, cylinder design and manufacturing methods to ensure your cylinder functions exactly as required.

Customized options include:

- High strength materials such as 4140, QT100, AR (Abrasion Resistant) and other high yield strength carbon and alloy steels
- Increased shaft protection through induction hardened rods, thicker chrome, chrome over nickel and other material alternatives
- Leading edge seal technologies for heavy duty use, high wear environments, and abrasion resistance
- Expanded seal sets to resist shock pressures
- Bellows for external shaft protection
- External guards for ports, hoses and oil lines
- Bolt in glands for added strength
- High pressure ports (SAE Code 61/62 4 bolt flange designs)
- Integrated valves (relief, counterbalance or PO check) to protect the cylinder, maintain position, and control the rate of extension and retraction to counteract external forces
- Safety lockout
- Position sensor technology for increased cylinder precision and control
- Replaceable bushings and bearings for easier serviceability
- Hardened pins for added durability
- Custom designed mounting configurations to accommodate increased surface contact



CUSTOM OVERSIZED

RAM Custom Oversized cylinders are characterized as large diameter and/or long stroke hydraulic cylinders built for specialty applications where significant force or movement is required. Typically these cylinders are over 8 inches in bore or over 10 feet in stroke.

A wide range of equipment relies on this type of cylinder design. Applications that use oversized cylinders are:

- Building moving equipment
- Hydroelectric dams
- Gerry platforms
- Rail running gear
- Oil rig moving platforms and walking systems
- Bridge installations
- Hay compressors
- Suspension systems
- Offshore cylinders for skidding
- Heave compensation
- Deck mating
- Jacking and dredging
- Surface mining equipment
- Bulk material handling equipment
- Tunnel boring equipment
- Steel roller mills
- Hydraulic presses

Rely on RAM for an oversized design that complements your specific application.

BUILT TO YOUR SPECIFICATIONS

Rated Pressure: Up to 5000 PSI

Rod Size: As required

Rod Material: High tensile SAE C1045, ground and polished hard chrome plated

Barrel Size: As required

Barrel Material: High tensile SAE C1026/St52.3 cold drawn tube precision honed for extended seal life

Stroke: Up to 100 feet

Gland Material: Ductile iron 65-45-12 (ASTM A536) or steel (AISI 1026)

Piston Material: Ductile iron 65-45-12 (ASTM A536) or Steel (AISI 1026)

End Mounts: Trunnion, clevis, tang, cross tube, spherical bearing, custom bushing, flange, cross drilled holes

Head Style: Flange type heads secured with SAE Grade 8 bolts

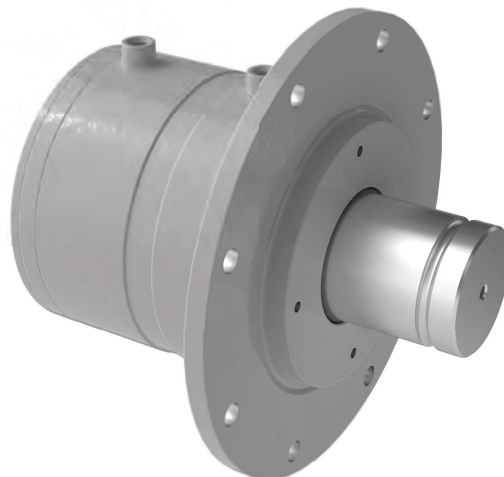
Ports: ORB, NPT, Code 61 or 62 4-bolt flange

Port Plugs: High quality steel

Internal Seals: North American

Paint Finish: 2 part urethane black

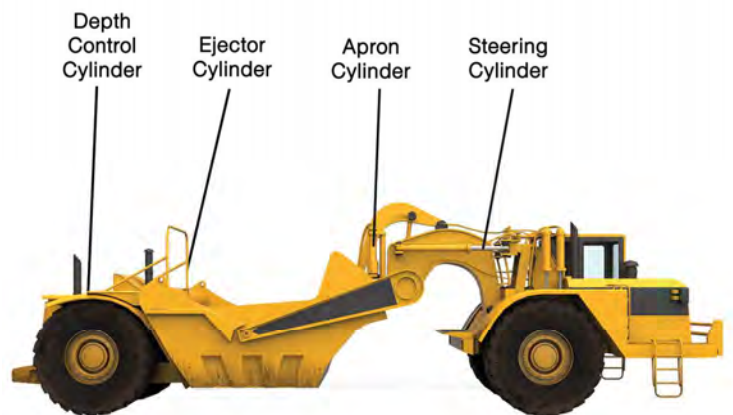
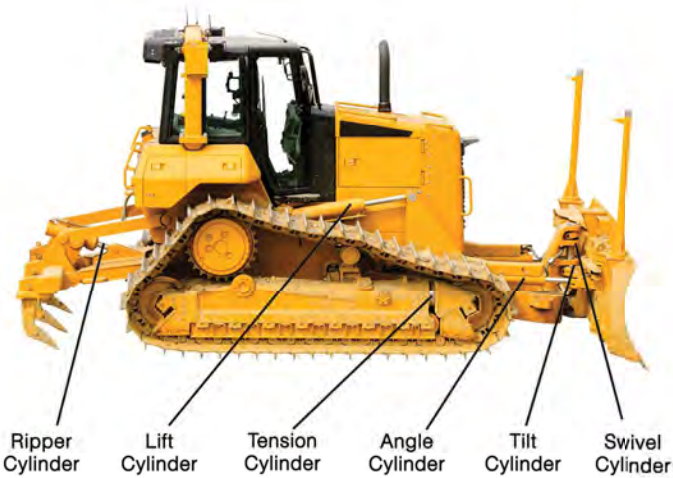
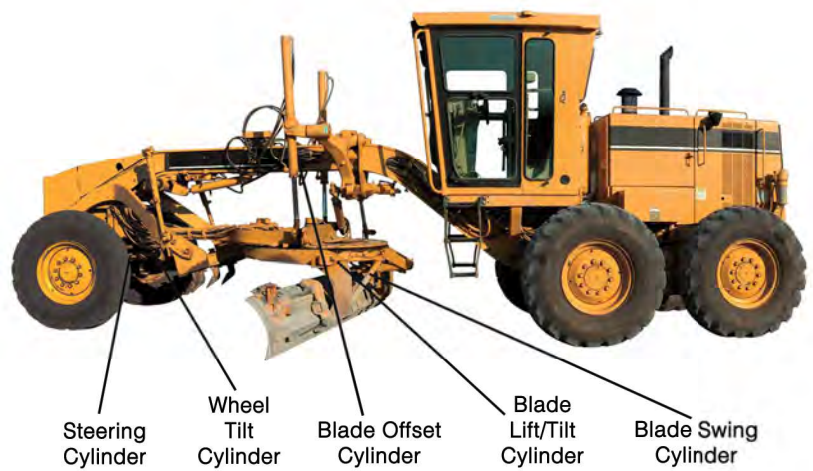
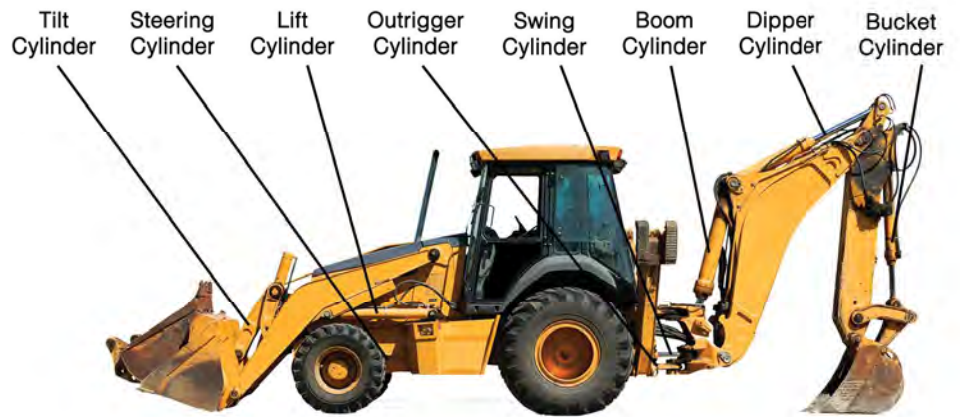
Testing: 100% full cycle tested



RAM hydraulic cylinders are used on a wide variety of construction and off-road equipment. Large bore and heavy duty fluid power components are often necessary for machinery that operates in rough and rugged conditions. These machines require high pressure ratings and frequently need bolted construction to maintain cylinder integrity under heavy loads.

RAM has 50 years of expertise in the design and supply of hydraulic cylinders for Original Equipment Manufacturers in the construction industry. RAM custom designed cylinders consistently meet the quality and dependability expected by manufacturers and equipment users throughout North America.

RAM understands the rugged working conditions of the off-road equipment sector and the high demands placed on reliable hydraulic cylinder performance. Our cylinders are custom designed and built to accommodate the unique working environments of this equipment.



PIGGY-BACK CYLINDERS

RAM Piggy-back cylinders are two cylinders that are welded or yoked together in opposite directions. This cylinder design is very effective to provide maximum stroke in areas where space is constrained. For applications that require a shorter retraction length, these cylinders can double the stroke available while maintaining consistent force for the full extension and retraction.

There are many advantages of building your equipment with Piggy-back style cylinders:

- Useful in light to heavy duty applications
- Better retraction forces
- Simplified seal kits with consistent barrel diameter
- Pressure ratings up to 5000 PSI
- Barrel fed cylinders can incorporate smart sensors

There are many applications where this type of cylinder is well suited. Examples include - outrigger and stabilizer deployment, crane boom extensions, tow trucks underlift extension, wreckers, shutes and dump applications. Some unique applications also include manure spreaders, rock pickers, oil patch platforms and oil tubing injectors.

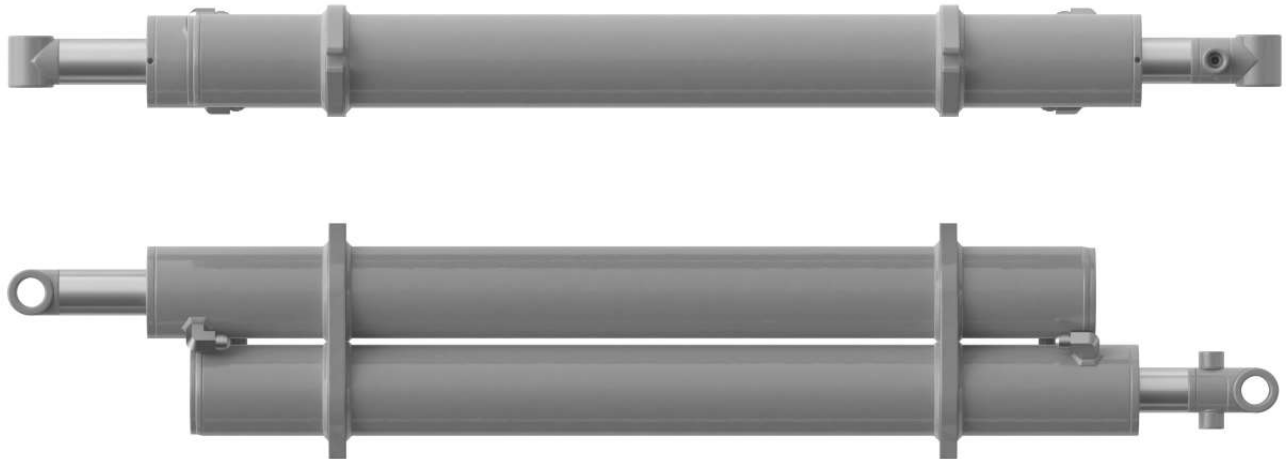
A wide range of sizes (bore & stroke) are available for RAM Piggy-back cylinders. We are well-versed in the latest technologies in materials, cylinder componentry, cylinder design and manufacturing methods to ensure your cylinder functions exactly as required. The assessment of your equipment's operating environment is important, as RAM's expertise is in supplying cylinders that are specifically engineered for your application.

Standard options include:

- High strength materials such as 4140, QT100, AR (Abrasion Resistant) and other high yield strength carbon and alloy steels
- Increased shaft protection through induction hardened rods, thicker chrome, chrome over nickel, and other material alternatives
- Leading edge seal technologies for heavy duty use, high wear environments, and abrasion resistance
- Expanded seal sets to resist shock pressures
- Bellows for external shaft protection
- External guards for ports, hoses and oil lines
- Bolt in glands for added strength
- High pressure ports (SAE Code 61/62 4 bolt flange designs)
- Integrated valve options (relief, counterbalance or PO check) to protect the cylinder, maintain position, and control the rate of extension and retraction to counteract external forces
- Safety lockout
- Position sensor technology for increased cylinder precision and control
- Replaceable bushings and bearings for easier serviceability
- Hardened pins for added durability
- Custom designed mounting configurations to accommodate specific requirements

BUILT TO YOUR SPECIFICATIONS

Rated Pressure:	Up to 5000 PSI	End Mounts:	Trunnion, cross tube
Rod Size:	Starting at 1 1/2"	Head Style:	Bolt in flange type manufactured from ductile or steel
Rod Material:	High tensile SAE C1045, ground and polished hard chrome plated	Ports:	ORB, NPT, or Code 61 or 62 4-bolt flange
Barrel Size:	Up to 14"	Port Plugs:	High quality steel
Barrel Material:	High tensile SAE C1026/St52.3 cold drawn tube precision honed for extended seal life	Internal Seals:	North American
Gland Material:	Ductile iron 65-45-12 (ASTM A536) or steel (AISI 1026)	Paint Finish:	2 part urethane black
Piston Material:	Ductile iron 65-45-12 (ASTM A536) or steel (AISI 1026)	Testing:	100% full cycle tested



SMART SENSOR

RAM Smart Sensor cylinders incorporate position sensing technology that streamlines equipment operation. With trends toward automation, position sensing hydraulic cylinders provide the smart integration required to complete an intelligent hydraulic system. With the increased demand for this technology, applications that utilize loading and unloading, transporting, lifting, and processing will benefit from these position sensing cylinders.

RAM cylinders incorporate Linear Displacement Transducers (LDTs), often referred to as linear position sensors. This technology can capture positional data and relay feedback through a signal to the hydraulic control system. The electronic feedback generates semi-automated or automated responses in the system triggering actions or sounding alarms as dictated by the specific application.

This innovative componentry achieves digital precision that responds to operational conditions as they occur. This real-time response creates efficiencies through automated responses and optimizes work for operators improving productivity and efficiency through increased output.

RAM can incorporate position sensing technologies in any custom designed hydraulic cylinder.

A variety of bore sizes, stroke lengths, and mounting options can be configured to meet your overall design and industry needs. When you are designing your intelligent systems, look to RAM Industries to provide smart hydraulic cylinders that will perfectly integrate into your system.

Applications where Smart Sensor cylinder technologies have been implemented include:

- Height control on spray booms
- GPS controlled steering
- Bucket position control
- Trailer outriggers
- Snowplow control sensing
- Stabilize cranes
- Asphalt depth control
- Height control on man lift booms
- Street sanding sensors
- Mold injection applications
- Wheelchair lifts

BUILT TO YOUR SPECIFICATIONS

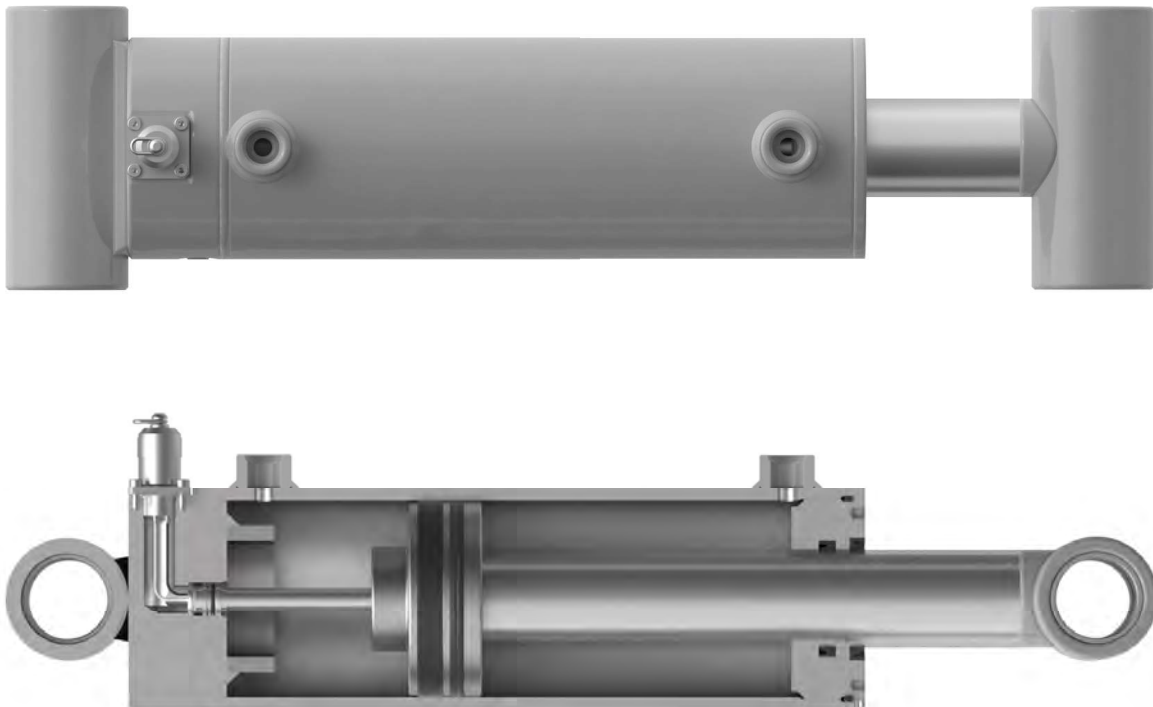
Rated Pressure:	Up to 4750 PSI	Temperature:	Output optional
Rod Size:	Up to 12" diameter	Velocity:	Output optional
Barrel Size:	Minimum 2.50" bore size	Power:	Various input options
Stroke:	2" to 120"	Transducer:	ATEX and IEC external approved linear transducer available
Resolution:	0.02" standard	Other:	High vibration & shock resistance
Connector:	M12		High cycle life
Output:	Analog or digital		

EXTERNAL SENSOR SOLUTION

An external sensor option involves mounting a transducer externally onto a standard carbon steel cylinder. The cylinder position is measured when a pre-fitted permanently embedded magnet in the piston is moved by hydraulic pressure. The externally mounted transducer allows equipment operators and maintenance personnel to access and replace the sensor if necessary, and can provide a more economical solution than an internal sensor. This method is recommended for cylinders that are not exposed to harsh environments.

INTERNAL SENSOR SOLUTION

An internal sensor option involves the transducer being configured for mounting inside a cylinder. This internal configuration features a hole that is gun drilled down the center of the cylinder rod. The cylinder end cap is machined to accommodate the transducer. This method usually consumes the least amount of space, however, the transducer is less accessible than mounting it externally. This method of internal mounting shields the transducer from external environmental conditions, thus increasing its life span.



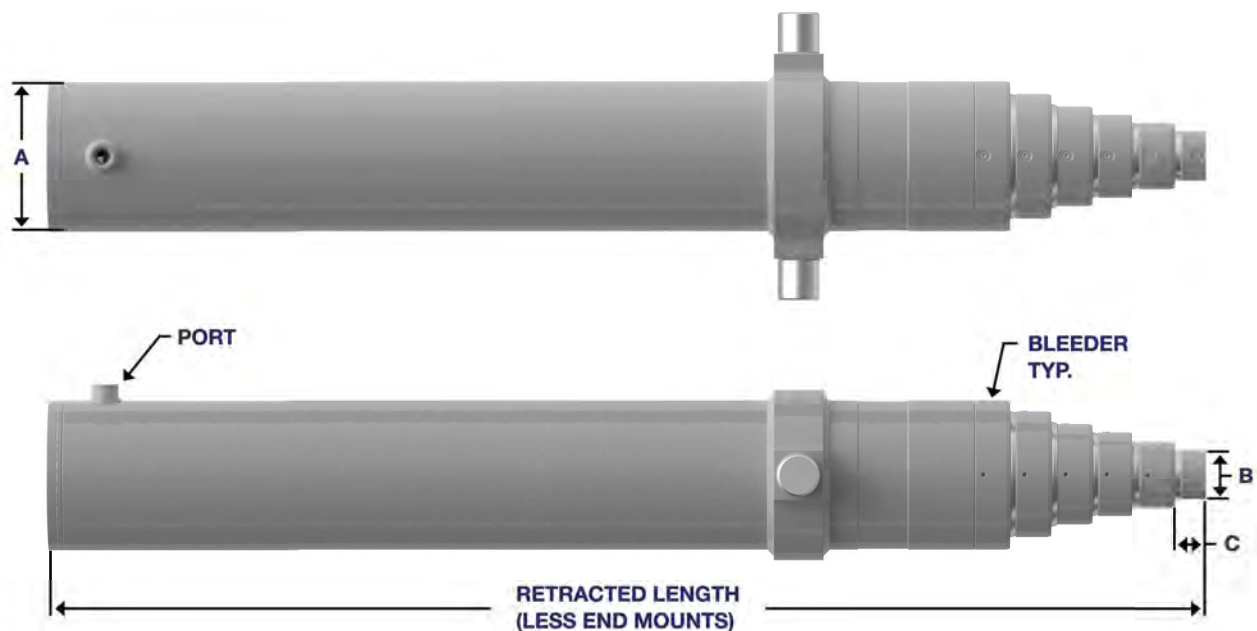
SINGLE ACTING TELESCOPIC

RAM is pleased to offer a full line of standard telescopic designs for your equipment. These designs are pre-engineered using in stock material and internal components for quick order turnaround. With 36 base designs to select from, all you need to do is pick the configuration, stroke and mounting option that works best for your application. RAM offers both Single and Double Acting designs with up to 5 stages, and a wide selection of standard mount configurations. Not sure what is the fit best for you? Contact the RAM engineering team and let them help you select the best design for your equipment needs.

The Single Acting Telescopic cylinder is the simplest of telescopic designs. A Single Acting Telescopic cylinder is extended using hydraulic pressure, but is retracted using external forces (i.e. gravity or mechanical load) once the pressure is removed. Single Acting cylinders offer a more compact design than a Double Acting design. RAM's standard design includes specially prepared chrome tubing, high quality seals and high strength internal components that can be easily serviced and replaced.

STANDARD FEATURES

Intended Use:	Single acting extension	Gland Material:	High strength steel glands and stops (1045 Q&T)
Rated Pressure:	3000 PSI	Piston Material:	Ductile iron 65-45-12 (ASTM A536)
Rod Material:	High tensile SAE C1026/St2.3 DOM, hard chrome plated	Ports:	SAE standard; NPTF also available
Barrel Material:	High tensile SAE C1026/St52.3 cold drawn tube precision honed for extended seal life	Port Plugs:	High quality steel
		Internal Seals:	North American
		Paint Finish:	2 part urethane black
		Testing:	100% full cycle tested



2 Stage Model	Bore Size (inches)	Rod Diameter (inches)	Maximum Load (lbf)	Closed Length (Less End Mounts) (inches)	A (inches)	B (inches)	C (inches)	Extended Port
CT-3.50-XX-2SA	3.50/2.50	3.00/2.00	14,700	(STROKE/2) + 12.25	4.00	2.00	2.00	#8 ORB
CT-4.50-XX-2SA	4.50/3.50	4.00/3.00	28,800	(STROKE/2) + 13.00	5.00	3.00	2.00	#10 ORB
CT-5.50-XX-2SA	5.50/4.50	5.00/4.00	47,700	(STROKE/2) + 13.75	6.00	4.00	2.00	#12 ORB
CT-6.75-XX-2SA	6.75/5.50	6.25/5.00	71,200	(STROKE/2) + 14.25	7.50	5.00	2.00	#16 ORB
CT-8.25-XX-2SA	8.25/6.75	7.50/6.25	107,300	(STROKE/2) + 14.50	9.00	6.25	2.00	#20 ORB
CT-9.75-XX-2SA	9.75/8.25	9.00/7.50	160,300	(STROKE/2) + 15.00	10.75	7.50	2.00	#20 ORB

3 Stage Model	Bore Size (inches)	Rod Diameter (inches)	Maximum Load (lbf)	Closed Length (Less End Mounts) (inches)	A (inches)	B (inches)	C (inches)	Extended Port
CT-4.50-XX-3SA	4.50/3.50/2.50	4.00/3.00/2.00	14,700	(STROKE/3) + 15.00	5.00	2.00	2.00	#8 ORB
CT-5.50-XX-3SA	5.50/4.50/3.50	5.00/4.00/3.00	28,800	(STROKE/3) + 15.75	6.00	3.00	2.00	#10 ORB
CT-6.75-XX-3SA	6.75/5.50/4.50	6.25/5.00/4.00	47,700	(STROKE/3) + 16.25	7.50	4.00	2.00	#12 ORB
CT-8.25-XX-3SA	8.25/6.75/5.50	7.50/6.25/5.00	71,200	(STROKE/3) + 16.50	9.00	5.00	2.00	#16 ORB
CT-9.75-XX-3SA	9.75/8.25/6.75	9.00/7.50/6.25	107,300	(STROKE/3) + 17.00	10.75	6.25	2.00	#20 ORB

4 Stage Model	Bore Size (inches)	Rod Diameter (inches)	Maximum Load (lbf)	Closed Length (Less End Mounts) (inches)	A (inches)	B (inches)	C (inches)	Extended Port
CT-5.50-XX-4SA	5.50/4.50/3.50/2.50	5.00/4.00/3.00/2.00	14,700	(STROKE/4) + 16.75	6.00	2.00	2.00	#8 ORB
CT-6.75-XX-4SA	6.75/5.50/4.50/3.50	6.25/5.00/4.00/3.00	28,800	(STROKE/4) + 17.25	7.50	3.00	2.00	#10 ORB
CT-8.25-XX-4SA	8.25/6.75/5.50/4.50	7.50/6.25/5.00/4.00	47,700	(STROKE/4) + 17.50	9.00	4.00	2.00	#12 ORB
CT-9.75-XX-4SA	9.75/8.25/6.75/5.50	9.00/7.50/6.25/5.00	71,200	(STROKE/4) + 18.00	10.75	5.00	2.00	#16 ORB

5 Stage Model	Bore Size (inches)	Rod Diameter (inches)	Maximum Load (lbf)	Closed Length (Less End Mounts) (inches)	A (inches)	B (inches)	C (inches)	Extended Port
CT-6.75-XX-5SA	6.75/5.50/4.50/3.50/2.50	6.25/5.00/4.00/3.00/2.00	14,700	(STROKE/5) + 18.25	7.50	2.00	2.00	#8 ORB
CT-8.25-XX-5SA	8.25/6.75/5.50/4.50/3.50	7.50/6.25/5.00/4.00/3.00	28,800	(STROKE/5) + 18.50	9.00	3.00	2.00	#10 ORB
CT-9.75-XX-5SA	9.75/8.25/6.75/5.50/4.50	9.00/7.50/6.25/5.00/4.00	47,700	(STROKE/5) + 19.00	10.75	4.00	2.00	#12 ORB

* When ordering provide model number, stroke and mounts required.
 * Actual load may be limited based on final configuration.

All specifications are subject to change without notice.

DOUBLE ACTING TELESCOPIC

Double Acting Telescopic cylinders are characterized as cylinders that are both extended and retracted with hydraulic pressure. A Double Acting Telescopic cylinder is a more complex design and involves additional sealing within the internal body of the cylinder to seal off the different stages. Passageways are machined into the internal components of the cylinder to allow for proper staging. These cylinders are usually specified when there is no external force to retract the cylinder. RAM's standard Double Acting Telescopic design includes specially prepared chrome tubing, high quality seals and high strength internal components that can be easily serviced and replaced when required.

STANDARD FEATURES

Intended Use: Double acting extension & retraction

Rated Pressure: 3000 PSI

Rod Material: High tensile SAE C1026/St2.3 DOM, hard chrome plated

Barrel Material: High tensile SAE C1026/St52.3 cold drawn tube precision honed for extended seal life

Gland Material: High strength steel glands and stops (1045 Q&T)

Piston Material: Ductile iron 65-45-12 (ASTM A536)

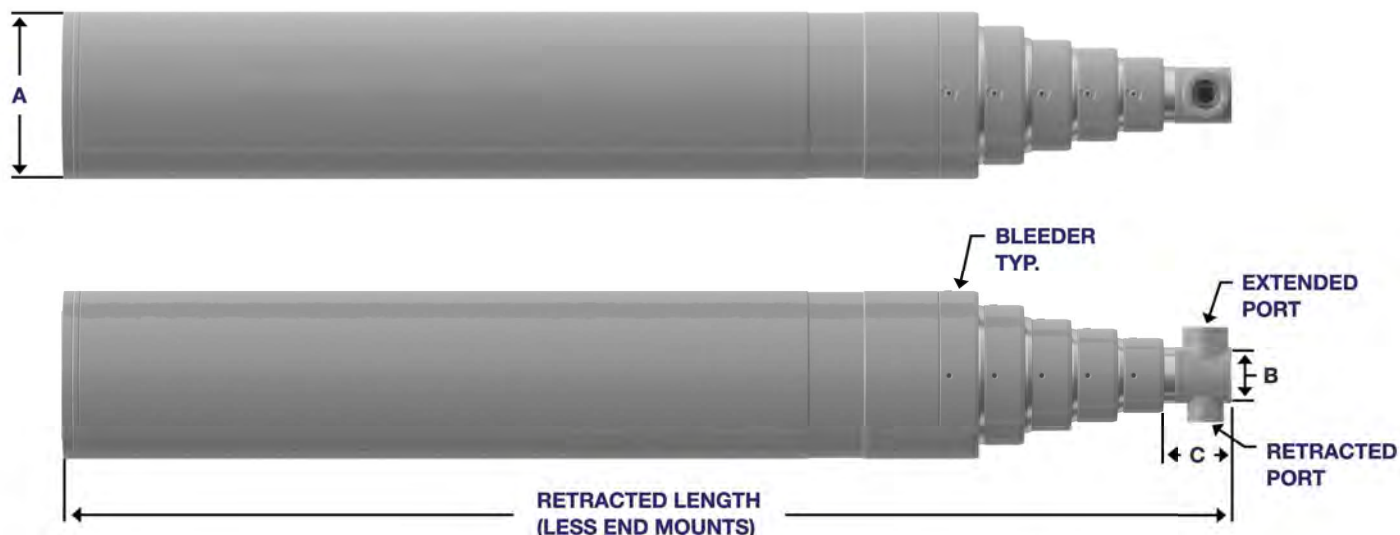
Ports: SAE ports; NPTF also available

Shipping Plugs: High quality steel

Internal Seals: North American made

Paint Finish: 2 part urethane black

Testing: 100% full cycle tested



2 Stage Model	Bore Size (inches)	Rod Diameter (inches)	Maximum Load (lbf)	Closed Length (Less End Mounts) (inches)	A (inches)	B (inches)	C (inches)	Extended Port	Retracted Port
CT-3.50-XX-2DA	3.50/2.50	3.00/2.00	14,700	(STROKE/2) + 13.25	4.00	2.00	2.63	#8 ORB	#6 ORB
CT-4.50-XX-2DA	4.50/3.50	4.00/3.00	28,800	(STROKE/2) + 14.00	5.00	3.00	2.63	#10 ORB	#8 ORB
CT-5.50-XX-2DA	5.50/4.50	5.00/4.00	47,700	(STROKE/2) + 14.75	6.00	4.00	2.88	#12 ORB	#10 ORB
CT-6.75-XX-2DA	6.75/5.50	6.25/5.00	71,200	(STROKE/2) + 15.50	7.50	5.00	3.38	#16 ORB	#12 ORB
CT-8.25-XX-2DA	8.25/6.75	7.50/6.25	107,300	(STROKE/2) + 16.50	9.00	6.25	3.88	#20 ORB	#16 ORB
CT-9.75-XX-2DA	9.75/8.25	9.00/7.50	160,300	(STROKE/2) + 17.00	10.75	7.50	3.88	#20 ORB	#16 ORB

3 Stage Model	Bore Size (inches)	Rod Diameter (inches)	Maximum Load (lbf)	Closed Length (Less End Mounts) (inches)	A (inches)	B (inches)	C (inches)	Extended Port	Retracted Port
CT-4.50-XX-3DA	4.50/3.50/2.50	4.00/3.00/2.00	14,700	(STROKE/3) + 16.00	5.00	2.00	2.63	#8 ORB	#6 ORB
CT-5.50-XX-3DA	5.50/4.50/3.50	5.00/4.00/3.00	28,800	(STROKE/3) + 16.75	6.00	3.00	2.63	#10 ORB	#8 ORB
CT-6.75-XX-3DA	6.75/5.50/4.50	6.25/5.00/4.00	47,700	(STROKE/3) + 17.50	7.50	4.00	2.88	#12 ORB	#10 ORB
CT-8.25-XX-3DA	8.25/6.75/5.50	7.50/6.25/5.00	71,200	(STROKE/3) + 18.50	9.00	5.00	3.38	#16 ORB	#12 ORB
CT-9.75-XX-3DA	9.75/8.25/6.75	9.00/7.50/6.25	107,300	(STROKE/3) + 19.50	10.75	6.25	3.88	#20 ORB	#16 ORB

4 Stage Model	Bore Size (inches)	Rod Diameter (inches)	Maximum Load (lbf)	Closed Length (Less End Mounts) (inches)	A (inches)	B (inches)	C (inches)	Extended Port	Retracted Port
CT-5.50-XX-4DA	5.50/4.50/3.50/2.50	5.00/4.00/3.00/2.00	14,700	(STROKE/4) + 17.75	6.00	2.00	2.63	#8 ORB	#6 ORB
CT-6.75-XX-4DA	6.75/5.50/4.50/3.50	6.25/5.00/4.00/3.00	28,800	(STROKE/4) + 18.00	7.50	3.00	2.63	#10 ORB	#8 ORB
CT-8.25-XX-4DA	8.25/6.75/5.50/4.50	7.50/6.25/5.00/4.00	47,700	(STROKE/4) + 19.00	9.00	4.00	2.88	#12 ORB	#10 ORB
CT-9.75-XX-4DA	9.75/8.25/6.75/5.50	9.00/7.50/6.25/5.00	71,200	(STROKE/4) + 20.00	10.75	5.00	3.38	#16 ORB	#12 ORB

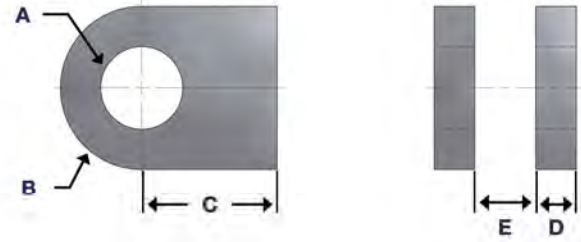
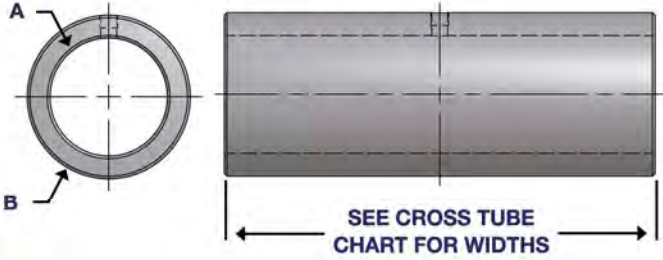
5 Stage Model	Bore Size (inches)	Rod Diameter (inches)	Maximum Load (lbf)	Closed Length (Less End Mounts) (inches)	A (inches)	B (inches)	C (inches)	Extended Port	Retracted Port
CT-6.75-XX-5DA	6.75/5.50/4.50/3.50/2.50	6.25/5.00/4.00/3.00/2.00	14,700	(STROKE/5) + 20.00	7.50	2.00	2.63	#8 ORB	#6 ORB
CT-8.25-XX-5DA	8.25/6.75/5.50/4.50/3.50	7.50/6.25/5.00/4.00/3.00	28,800	(STROKE/5) + 20.50	9.00	3.00	2.63	#10 ORB	#8 ORB
CT-9.75-XX-5DA	9.75/8.25/6.75/5.50/4.50	9.00/7.50/6.25/5.00/4.00	47,700	(STROKE/5) + 21.00	10.75	4.00	2.88	#12 ORB	#10 ORB

* When ordering provide model number, stroke and mounts required.

All specifications are subject to change without notice.



STANDARD TELESCOPIC MOUNTS



Cross Tube				
Bore	A	B	Width Base End	Minimum Recommended Length
3.50	1.015	1.75	4.25	Equal to the smallest cylinder shaft diameter + 0.25
4.50	1.265	2.00	5.25	
5.50	1.515	2.25	6.25	
6.75	2.015	3.00	7.75	
8.25	2.515	3.50	9.25	
9.75	3.030	4.00	11.00	

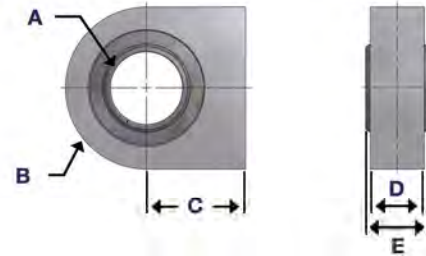
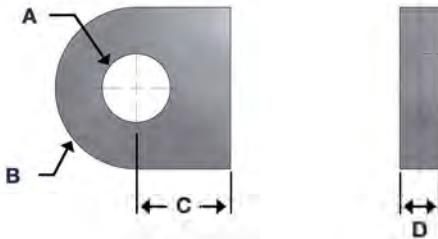
Clevis					
Bore	A	B	C	D	E
3.50	1.015	1.25	2.38	0.50	1.13
4.50	1.265	1.25	2.50	0.63	1.38
5.50	1.515	1.50	2.75	0.75	1.63
6.75	2.015	2.00	3.00	1.00	2.13
8.25	2.515	2.25	3.25	1.25	2.38
9.75	3.030	2.50	3.50	1.50	2.63

* All measurements are in inches.

All specifications are subject to change without notice.

* All measurements are in inches.

All specifications are subject to change without notice.



Tang				
Bore	A	B	C	D
3.50	1.015	1.00	1.75	1.00
4.50	1.265	1.25	2.00	1.50
5.50	1.515	1.50	2.25	1.75
6.75	2.015	2.00	2.75	2.00
8.25	2.515	2.25	3.00	2.50
9.75	3.03	2.50	3.25	3.00

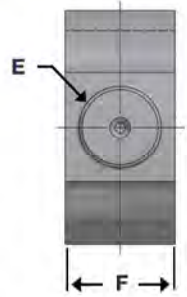
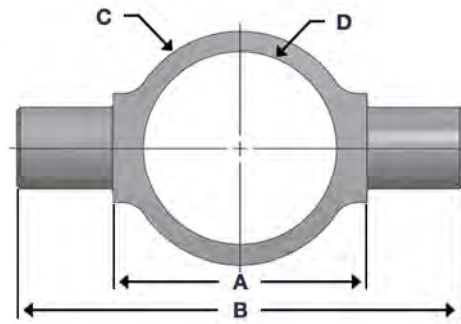
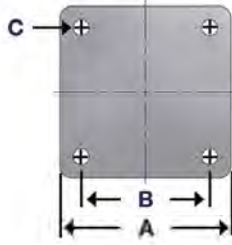
* All measurements are in inches.

All specifications are subject to change without notice.

Tang with Bearing					
Bore	A	B	C	D	E
3.50	1.00	1.375	2.00	1.38	0.88
4.50	1.25	1.875	2.50	1.88	1.09
5.50	1.50	2.375	3.00	2.38	1.31
6.75	2.00	2.875	3.50	2.88	1.75
8.25	2.50	3.313	4.25	3.31	2.19
9.75	3.00	3.750	4.50	3.75	2.63

* All measurements are in inches.

All specifications are subject to change without notice.



Flange				
Bore	A	B	C	D
3.50	5.50	4.00	0.53	0.75
4.50	7.00	5.25	0.66	1.00
5.50	8.00	6.00	0.78	1.25
6.75	9.50	7.25	1.03	1.50
8.25	11.25	8.50	1.28	1.75
9.75	13.50	10.00	1.53	2.00

* All measurements are in inches. All specifications are subject to change without notice.

Trunnion						
Bore	A	B	C	D	E	F
3.50	5.00	8.00	4.75	4.00	1.75	2.00
4.50	6.00	10.00	5.75	5.00	2.25	2.50
5.50	7.00	11.00	6.75	6.00	2.50	3.00
6.75	9.00	14.00	8.50	7.50	3.00	3.50
8.25	10.50	15.50	10.00	9.00	3.00	3.50
9.75	12.50	18.50	12.00	10.75	3.50	4.00

* All measurements are in inches. All specifications are subject to change without notice.

CUSTOM TELESCOPIC MOUNTS

In addition to standard mounting options, RAM will design and/or manufacture custom mounts in a wide array of styles and materials.

We can also offer unique mounting locations, mid barrel or on each stage, for additional support.

Contact the RAM Engineering team today and let them help select the best option for your application.



TRUCK AND TRAILER HOIST CYLINDERS

RAM Truck and Trailer Hoist cylinders are high quality single acting telescopic cylinders. They are specifically designed for use on dump truck bodies, dump trailers, and other general hoist applications.

The RAM Truck and Trailer Hoist cylinder design features enhanced capabilities over competitive designs including relative ease of installation and interchangeability with existing cylinders. One key feature of the RAM Truck and Trailer Hoist cylinder is its optimized internal componentry. RAM uses high quality materials to ensure a long working cylinder life for your equipment.

DEPENDABLE LIFTING CAPACITY

Rated at up to 3000 PSI, RAM Truck and Trailer Hoist cylinders are built with high strength materials to provide reliable performance for lifting capacity. A superior internal seal design ensures the cylinder can operate efficiently and reliably in truck hoist applications.

OPTIMIZED INTERNAL COMPONENTRY

With extensive experience in truck hoist design and manufacturing, RAM recognizes the demand for performance required for this specialized application. RAM Truck and Trailer Hoist cylinders feature high quality rod seals, high strength guide rings, and heavy duty wipers as standard features on all models. All of these features enhance the internal durability of the cylinder's components.

CYLINDER INTERCHANGEABILITY

The RAM Truck and Trailer Hoist cylinder line is designed to be interchangeable with existing industry standard cylinders, including many OEM dump body and trailer cylinders. All RAM hydraulic cylinders offer easy installation and cross compatibility.

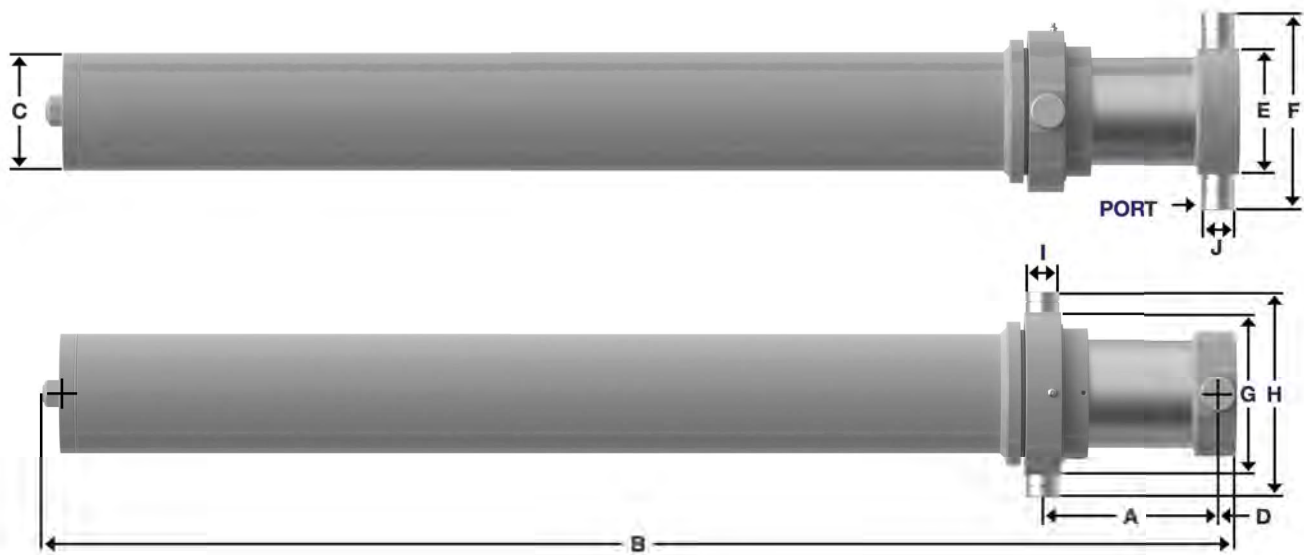
RAM understands there are many different variations of Truck and Trailer Hoist cylinders. RAM can modify standard cylinder designs to accommodate OEM specifications. Customized options include:

- Non-standard strokes
- Special port requirements
- Custom valve blocks
- Custom mounting designs

TRUNNION MOUNT TELESCOPIC CYLINDER STANDARD FEATURES

Intended Use: Single acting truck box hoist
Rated Pressure: 3000 PSI
Rod Material: High tensile steel, ground and polished
 hard chrome plated
Barrel Material: High tensile steel/St52.3
 cold drawn tube

End Mounts: High strength steel trunnions with
 greaseable bearings, greaseable grooves
Ports: SAE standard
Internal Seals: Heavy duty urethane seals
Paint Finish: 2 part urethane black
Testing: 100% full cycle tested



RAM Part Number	RAM Model Number	Stroke (inches)	A	B	C	D	E	F	G	H	I	Ports	Shipping Weight (lbs)
R4508806	CT-5.08-140.00-3	140	6.25	60.90	6.77	2.00	7.00	11.00	9.00	11.50	1.88	SAE-12	394
R4509002	CT-5.87-150.00-4	150	7.63	60.24	7.56	2.00	8.00	12.00	10.19	13.19	2.25	SAE-16	510
R4509011	CT-6.65-185.00-4	185	9.63	64.38	8.62	2.50	9.00	13.00	12.00	15.00	2.25	SAE-16	667
R4509012	CT-6.65-182.00-4	185	9.63	64.38	8.62	2.50	9.00	13.00	11.19	14.19	2.25	SAE-16	673

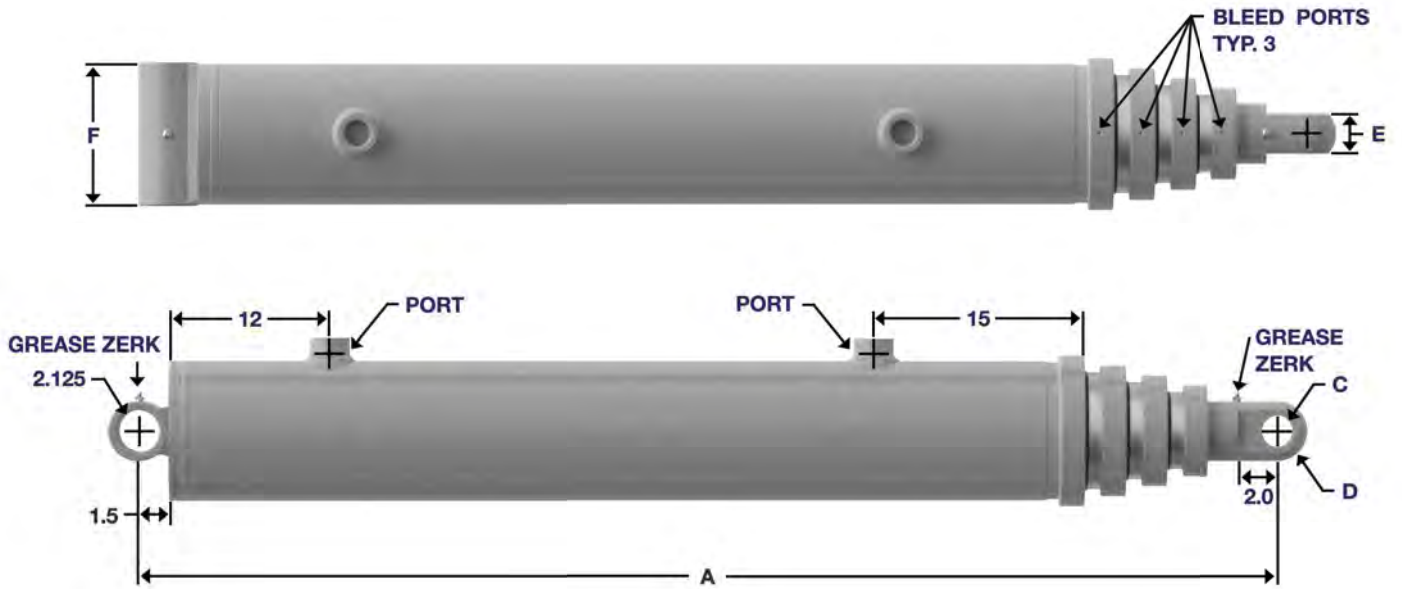
Measurements for A, B, C, D, E, F, G, H, I are in inches.

All specifications are subject to change without notice.
 Weights are approximate shipping weights

PIN TO PIN TELESCOPIC CYLINDER STANDARD FEATURES

Intended Use: Single acting trailer box hoist
Rated Pressure: 2500 PSI
Rod Material: High tensile steel, ground and polished
 hard chrome plated
Barrel Material: High tensile steel/St52.3
 cold drawn tube

End Mounts: High strength steel mounts with
 grease zerks
Ports: SAE standard
Internal Seals: Proven v-packing design
Paint Finish: 2 part urethane black
Testing: 100% full cycle tested



RAM Part Number	RAM Model Number	Stroke (inches)	A	B	C	D	E	F	Ports	Weight (lbs)
R4509123	CT-6.00-156.00-4	156	53.63	7.00	2.06	1.50	1.75	7.13	SAE-16	305
R4509124	CT-8.00-265.00-5	265	71.00	9.45	2.06	1.50	2.00	9.50	SAE-16	730
R4509125	CT-9.38-265.00-5	265	71.38	10.88	2.06	1.50	2.00	10.88	SAE-16	950

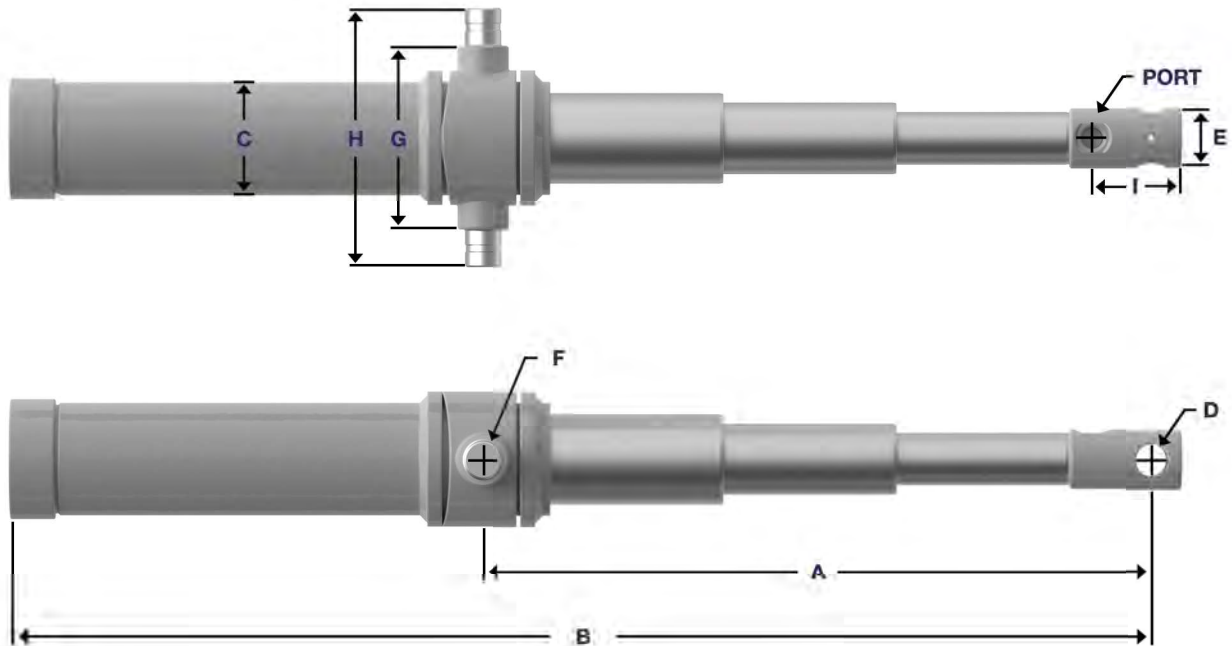
Measurements for A, B, C, D, E, F are in inches.

All specifications are subject to change without notice.
 Weights are approximate shipping weights.

SMALL TRAILER TELESCOPIC CYLINDER STANDARD FEATURES

Intended Use: Single acting small trailer box hoist
Rated Pressure: 3000 PSI
Rod Material: High tensile steel, ground and polished
 hard chrome plated
Barrel Material: High tensile steel/St52.3
 cold drawn tube

End Mounts: High strength steel pivoting trunnion
 Machined pin eye with spherical rod end
Ports: SAE standard
Internal Seals: Heavy duty urethane seals
Paint Finish: 2 part urethane black
Testing: 100% full cycle tested



Size	RAM Part Number	RAM Model Number	Stroke (inches)	A	B	C	D	E	F	G	H	I	Ports	Weight (lbs)
7 Ton	R4509139	CT-3.00-78.00-3	78	7.00	35.50	3.75	1.063	2.00	1.25	6.50	9.00	3.00	SAE-8	70
	R4509140	CT-3.00-90.00-3	90	7.00	39.50	3.75	1.063	2.00	1.25	6.50	9.00	3.00	SAE-8	75
	R4509141	CT-3.00-108.00-3	108	7.00	45.00	3.75	1.063	2.00	1.25	6.50	9.00	3.00	SAE-8	100
12 Ton	R4509142	CT-3.63-78.00-3	78	7.00	34.75	4.43	1.063	2.00	1.50	7.50	10.50	3.00	SAE-8	108
	R4509143	CT-3.63-90.00-3	90	7.00	38.75	4.43	1.063	2.00	1.50	7.50	10.50	3.00	SAE-8	110
	R4509144	CT-3.63-108.00-3	108	7.00	44.75	4.43	1.063	2.00	1.50	7.50	10.50	3.00	SAE-8	135
	R4509145	CT-3.63-120.00-3	120	7.00	48.75	4.43	1.063	2.00	1.50	7.50	10.50	3.00	SAE-8	145
	R4509146	CT-3.63-144.00-3	144	7.00	56.75	4.43	1.063	2.00	1.50	7.50	10.50	3.00	SAE-8	165

Measurements for A, B, C, D, E, F, G, H, I are in inches.

All specifications are subject to change without notice.
 Weights are approximate shipping weights.

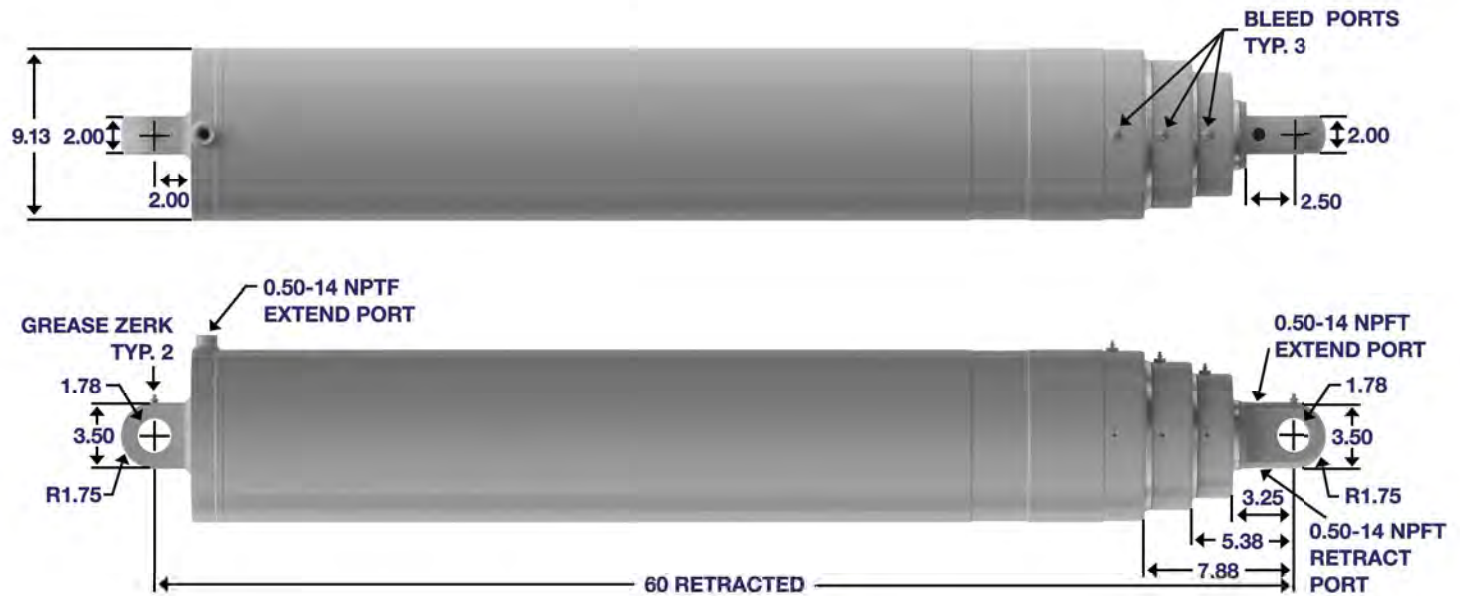
MAST RAISING

RAM Industries produces Mast Raising Telescopic cylinders to accommodate the needs of the oil and gas industry. When deployed, most masts do not have an even center of gravity. RAM Mast Raising cylinders are a unique hybrid of single and double-acting designs. The first stages of the cylinder are single-acting, with the last stage being double-acting to pull the weight of the load back over the center.

RAM's standard mast raising cylinder designs are frequently used on smaller service rigs. These cylinders comply with industry standards and offer a 60-inch retracted length and 8.50 inch base bore size with 2500 PSI operating pressure. RAM ensures these cylinders are well supported internally to withstand the loading demands during deployment. The default mount includes tang mounting on the rod and base with standard grease zerks to provide lubrication to the joint.

RAM also has experience producing larger or even smaller mast raising cylinders. RAM offers 50 years of cylinder design and manufacturing experience to accommodate customized hydraulic solutions for your application.

Contact RAM Industries to discuss your mast raising cylinder needs.



RAM Model: CW-8.50-131.50-8.00
Part Number: R4507986

SPECIFICATIONS (inches)

Single Acting with Double Acting Third Stage

Pressure Rating: 2500 PSI

Bore Sizes: 8.50 / 7.25 / 6.25

Shaft Sizes: 8.00 / 6.75 / 3.75

Stroke Length: 131.50

Operating Parameters @ 2500 PSI			
Stage	Push (lbf)	Pull (lbf)	Stroke (inches)
1	125600	-	42.25
2	89400	-	44.00
3	76700	49050	45.25

All specifications are subject to change without notice

STANDARD FEATURES

Intended Use: Single acting with double acting assist

Rated Pressure: 2500 PSI

Rod Material: High tensile SAE C1026/St52.3, ground and polished hard chrome plated

Barrel Material: High tensile SAE C1026/St52.3 cold drawn tube precision honed for extended seal life

Gland Material: Ductile iron 65-45-12 (ASTM A536) or steel (AISI 1026)

Piston Material: Ductile iron 65-45-12 (ASTM A536) or steel (AISI 1026)

End Mounts: Tang mounting on rod & base with standard grease zerk

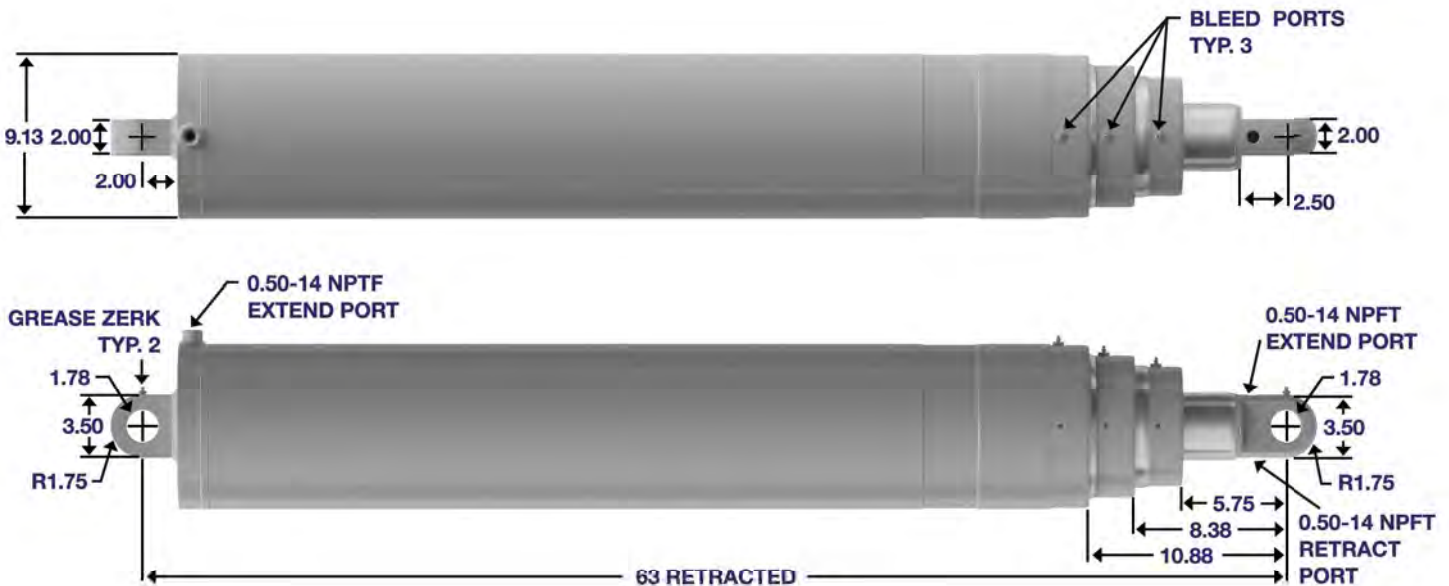
Ports: NPTF

Port Plugs: High quality steel

Internal Seals: North American

Paint Finish: 2 part urethane black

Testing: 100% full cycle tested



RAM Model: CW-8.50-132.00-8.00

Part Number: R4507888

SPECIFICATIONS (inches)

Single Acting with Double Acting Third Stage

Pressure Rating: 2500 PSI

Bore Sizes: 8.50 / 7.25 / 6.25

Shaft Sizes: 8.00 / 6.75 / 3.75

Stroke Length: 132

Operating Parameters @ 2500 PSI			
Stage	Push (lbf)	Pull (lbf)	Stroke (inches)
1	125600	-	42.25
2	89400	-	44.00
3	76700	49050	45.75

All specifications are subject to change without notice

CUSTOM TELESCOPIC

RAM Custom Telescopic cylinders give you the flexibility to work with our engineering experts to determine the cylinder design requirements that perfectly fit your equipment performance requirements. We have the expertise working with OEM customers to either modify a standard design or create a new prototype for their equipment.

SINGLE ACTING

Single Acting Telescopic cylinders are the simplest telescopic design. A Single Acting cylinder is extended using hydraulic pressure but is retracted using external forces (usually gravity), once the hydraulic pressure is removed.

SINGLE/DOUBLE COMBINATION

Single/Double Combination Telescopic cylinders are a Single Acting Telescopic cylinder where one or more of the smaller stages are Double Acting. A typical application is a mast raising design on a drilling rig where the load must be pulled over center until gravity can take over to retract the cylinder.

DOUBLE ACTING

Double Acting Telescopic cylinder designs are extended and retracted using hydraulic pressure. A Double Acting Telescopic cylinder is a more complex design and involves additional sealing within the internal body of the cylinder to seal off the different stages. Passageways are machined into the internal components of the cylinder to allow for proper staging. This type of design is usually utilized when gravity is not available to retract the cylinder.

Telescopic cylinders provide a long stroke from a very compact retracted length. RAM has experience designing telescopic cylinders for a number of industries and applications and can work with you to design a single acting, a single acting/double acting combination, or a double acting design.



BUILT TO YOUR SPECIFICATIONS

Rated Pressure: Up to 5000 PSI

Stages: 2 to 5 working sections

Rod Material: High tensile SAE C1045, ground and polished hard chrome plated

Barrel Size: Up to 20" diameter

Barrel Material: High tensile SAE C1026/St52.3 cold drawn tube precision honed for extended seal life

Gland Material: Ductile iron 65-45-12 (ASTM A536) or Steel (AISI 1026) internally threaded

Piston Material: Integrated machined piston design option

Valves: Optional integrated valves

Ports: Custom arrangements for size, type and location options

Seal Options: Urethane wiper seals, modern urethane lipped shaft seal, modern urethane one piece static seals, glass filled nylon gland bearing rings, glass filled nylon piston bearing rings, cast iron piston rings, interlocking step-cut reinforced heat stabilized thermoplastic zero leak piston rings, and custom sealing arrangements for high or low temperature, high cycle or continuous duty

Paint Finish: 2 part urethane black or custom colors

CUSTOM TELESCOPIC MOUNTS

RAM can design and/or manufacture custom mounts in a wide array of styles and materials.

We can also offer unique mounting locations, mid barrel or on each stage, for additional support.

Contact the RAM Engineering team today and let them help select the best option for your application.



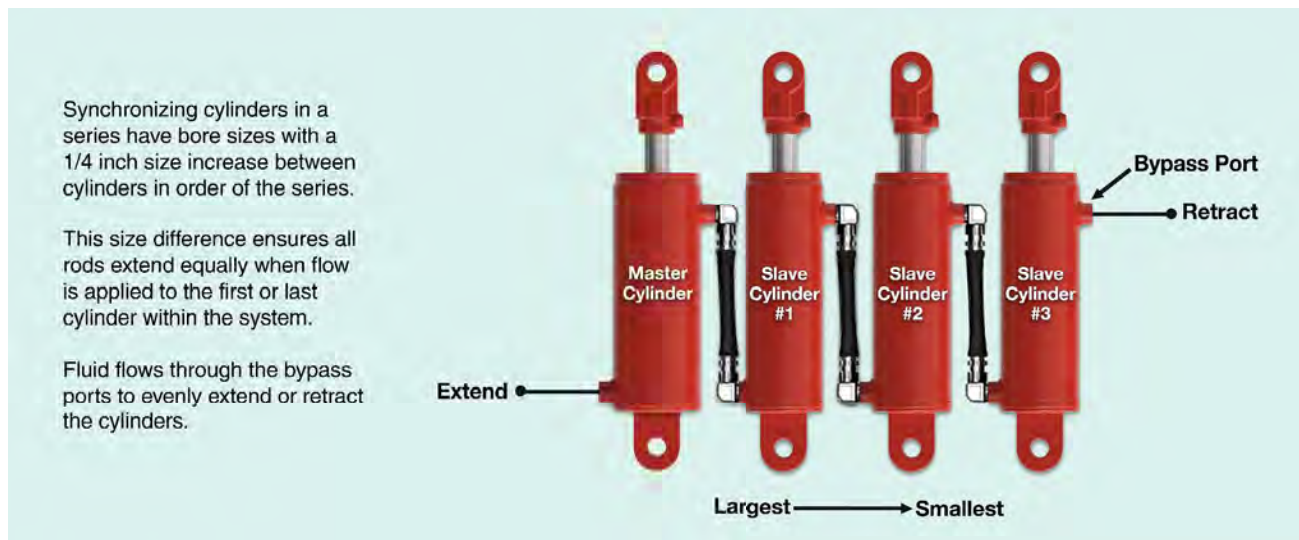
SYNCHRONIZING (REPHASING)

RAM Synchronizing cylinders are the perfect solution for applications that require two or more cylinders to extend and retract in near-unison. RAM Synchronizing hydraulic cylinders implement rephasing technology. This enables a master cylinder and one or more slave cylinders to reliably retract in synchronization.

RAM's standard synchronizing cylinder designs have a rephasing groove machined at the position of full extension. This allows the oil to bypass the piston seal when fully extended. The rephasing passageway enables the cylinders to rephase, operating evenly to raise and lower an implement to the desired working depth. Rephasing also allows air to be purged from the system, which helps to maintain consistent operating pressure.

All RAM hydraulic cylinders can be customized to perfectly fit your equipment requirements. Adding a depth control valve assembly will provide precise and infinite control of the rod movement. RAM also offers an optional ball check synchronizing cylinder design. This custom machined port uses a ball to block the rephasing groove to enable cylinder retraction at any position.

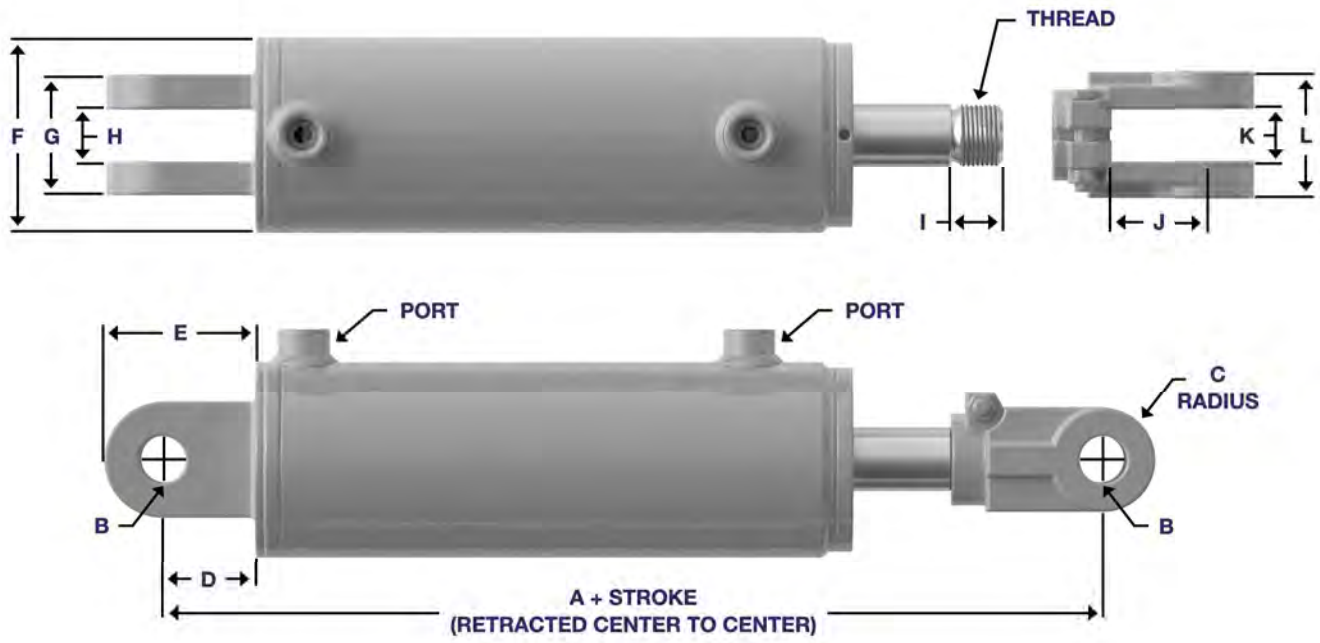
Contact the RAM Engineering team to design a Synchronizing Cylinder set for your application!



STANDARD FEATURES

Intended Use: Double acting applications
Rated Pressure: 3000 PSI
Rod Material: High tensile SAE C1045, ground and polished hard chrome plated
Barrel Material: High tensile SAE C1026/St52.3 cold drawn tube precision honed for extended seal life
Gland Material: Ductile iron 65-45-12 (ASTM A536)
Piston Material: Ductile iron 65-45-12 (ASTM A536)

Piston Locknut: High tensile grade C
End Mounts: Female clevis
Clevis Clamp: Grade 8 bolt and nut
Ports: SAE
Port Plugs: High quality steel
Internal Seals: North American
Paint Finish: 2 part urethane black
Testing: 100% full cycle tested



Bore (inches)	A	B	C	D	E	F	G	H	I	J	K	L	Ports	Threads
2.50	12.25	1.02	1.13	2.00	3.25	2.38	2.13	1.13	1.13	2.00	1.13	2.75	SAE-8	1.125-12 UNF
2.75	12.25	1.02	1.13	2.00	3.25	3.13	2.13	1.13	1.13	2.00	1.13	2.75	SAE-8	1.125-12 UNF
3.00	12.25	1.02	1.13	2.00	3.25	3.38	2.13	1.13	1.13	2.00	1.13	2.75	SAE-8	1.250-12 UNF
3.25	12.25	1.02	1.13	2.00	3.25	3.63	2.38	1.13	1.13	2.00	1.13	2.75	SAE-8	1.250-12 UNF
3.50	12.25	1.02	1.13	2.00	3.25	3.88	2.38	1.13	1.13	2.00	1.13	2.75	SAE-8	1.250-12 UNF
3.75	12.25	1.02	1.13	2.00	3.25	4.25	2.63	1.13	1.13	2.00	1.13	2.75	SAE-8	1.250-12 UNF
4.00	12.25	1.02	1.13	2.00	3.25	4.50	2.63	1.13	1.13	2.00	1.13	2.75	SAE-8	1.250-12 UNF
4.25	12.25	1.02	1.13	2.00	3.25	4.75	2.63	1.13	1.13	2.00	1.13	2.75	SAE-8	1.250-12 UNF
4.50	12.25	1.02	1.13	2.00	3.25	5.00	2.63	1.13	1.13	2.00	1.13	2.75	SAE-8	1.250-12 UNF
4.75	12.25	1.02	1.13	2.00	3.25	5.25	2.63	1.13	1.13	2.00	1.13	2.75	SAE-8	1.250-12 UNF
5.00	12.25	1.02	1.13	2.00	3.25	5.50	2.63	1.13	1.13	2.00	1.13	2.75	SAE-8	1.250-12 UNF

Measurements for A, B, C, D, E, F, G, H, I, J, K, L are in inches.

All specifications are subject to change without notice.

SYNCHRONIZING (REPHASING)

Bore Size (inches)	RAM Part Number	Stroke (inches)	Rod Diameter (inches)	Retracted Length	Ports	Pin Diameter (inches)
2.50	R4507582	8	1.125	20.25	SAE-8	1.000
	R4507593	10	1.125	22.25		
	R4507681	12	1.125	24.25		
	R4507692	16	1.125	28.25		
2.75	R4507583	8	1.125	20.25	SAE-8	1.000
	R4507594	10	1.125	22.25		
	R4507682	12	1.125	24.25		
	R4507693	16	1.125	28.25		
3.00	R4507584	8	1.250	20.25	SAE-8	1.000
	R4507595	10	1.250	22.25		
	R4507683	12	1.250	24.25		
	R4507694	16	1.250	28.25		
3.25	R4507585	8	1.250	20.25	SAE-8	1.000
	R4507596	10	1.250	22.25		
	R4507684	12	1.250	24.25		
	R4507695	16	1.250	28.25		
3.50	R4507586	8	1.250	20.25	SAE-8	1.000
	R4507597	10	1.250	22.25		
	R4507685	12	1.250	24.25		
	R4507696	16	1.250	28.25		
3.75	R4507587	8	1.375	20.25	SAE-8	1.000
	R4507675	10	1.375	22.25		
	R4507686	12	1.375	24.25		
	R4507697	16	1.375	28.25		

All specifications are subject to change without notice.

Bore Size (inches)	RAM Part Number	Stroke (inches)	Rod Diameter (inches)	Retracted Length	Ports	Pin Diameter (inches)
4.00	R4507588	8	1.375	20.25	SAE-8	1.000
	R4507676	10	1.375	22.25		
	R4507687	12	1.375	24.25		
	R4507698	16	1.375	28.25		
4.25	R4507589	8	1.500	20.25	SAE-8	1.000
	R4507677	10	1.500	22.25		
	R4507688	12	1.500	24.25		
	R4507699	16	1.500	28.25		
4.50	R4507590	8	1.500	20.25	SAE-8	1.000
	R4507678	10	1.500	22.25		
	R4507689	12	1.500	24.25		
	R4507747	16	1.500	28.25		
4.75	R4507591	8	1.500	20.25	SAE-8	1.000
	R4507679	10	1.500	22.25		
	R4507690	12	1.500	24.25		
	R4507748	16	1.500	28.25		
5.00	R4507592	8	1.500	20.25	SAE-8	1.000
	R4507680	10	1.500	22.25		
	R4507691	12	1.500	24.25		
	R4507749	16	1.500	28.25		

All specifications are subject to change without notice.

RAM Synchronizing Cylinder Seal Kits		
Bore Size (inches)	RAM Part Number	Rod Diameter (inches)
2.50	R3607582	1.125
2.75	R3607583	1.125
3.00	R3607584	1.250
3.25	R3607585	1.250
3.50	R3607586	1.250
3.75	R3607587	1.375
4.00	R3607588	1.375
4.25	R3607589	1.500
4.50	R3607590	1.500
4.75	R3607591	1.500
5.00	R3607592	1.500

All specifications are subject to change without notice.

RAM Synchronizing Cylinder Components			
Item	Part Size	RAM Part Number	Shipping Weight (lbs)
Shaft Clevis	Fits 1-1/8" Shaft	R7600456	3.3
Shaft Clevis	Fits 1-1/4" Shaft	R7600455	3.3
Shaft Clevis	Fits 1-3/8" Shaft	R7600455	3.3
Shaft Clevis	Fits 1-1/2" Shaft	R7600455	3.3
Pin	1" x 2-7/8"	R3006631	0.8
Pin	1" x 2-1/4"	R3006632	0.6
Clip	Hairpin Clip	R3006300	0.02
Hydraulic Depth Control Valve Repair Kit		R3000530	0.7

All specifications are subject to change without notice.
All weights are approximate shipping weights.

PNEUMATIC CYLINDERS

RAM Industries designs and manufactures pneumatic cylinders specific to your unique applications.

Pneumatic cylinders are powered using compressed air instead of hydraulic fluid. When lower power is required, these air cylinders are a reliable fluid power alternative to hydraulic cylinders. Pneumatic systems are known for having a longer operating life. They also have low maintenance requirements.

The RAM engineering team works closely with the experts in your operation to produce custom cylinders engineered for your OEM equipment requirements. Customization considerations may include:

- Pneumatic cylinders are available as single-acting and double-acting cylinders using one or two ports to operate. Single-acting pneumatic cylinders can be configured with an optional spring return or extension for use in unique applications.
- A range of barrel materials can be used for pneumatic cylinders, including stainless steel, aluminum and chrome plated on the inside barrel. These materials are corrosion resistant, which helps provide protection against moisture in the air.
- Rod thread lengths can be produced specifically to your requirements in applications where a standard mount is not used, including non-standard thread sizes. Rod extensions can also be manufactured with non-standard lengths.

RAM's custom approach ensures your pneumatic cylinders provided easy interchangeability with existing cylinders and meet fit and performance requirements for existing and new equipment.

Applications that incorporate pneumatic cylinders include:

- Material handling systems
- Agricultural and fertilizer applications
- Marine applications
- Medical equipment
- Automation equipment
- Industrial fixturing and clamping
- Food production equipment
- Packaging equipment
- Entertainment equipment
- Truck clutch and braking system components

Reach out to RAM's engineering department for your challenging applications so we can provide solutions that meet your specifications and expectations.

BUILT TO YOUR SPECIFICATIONS

Rated Pressure: Up to 500 PSI

Rod Size: Starting at 1/2"

Rod Material: High tensile SAE C1045, ground and polished hard chrome plated

Barrel Size: From 1.00" to 14.00"

Barrel Material: Aluminum 6061-T6511 (ASTM B221), stainless steel 304, or high tensile SAE C1026.St52.3 cold drawn tube precision honed and chromed for extended seal life

Gland Material: Aluminum 6061-T6511 (ASTM B221) or aluminum bronze C95400-M07 (ASTM B505)

Piston Material: Aluminum 6061-T6511 (ASTM B221) or aluminum bronze C95400-M07 (ASTM B505)

End Mounts: Clevis, cross tube, flange or customized to OEM requirements

Head Style: Threaded or bolt-in

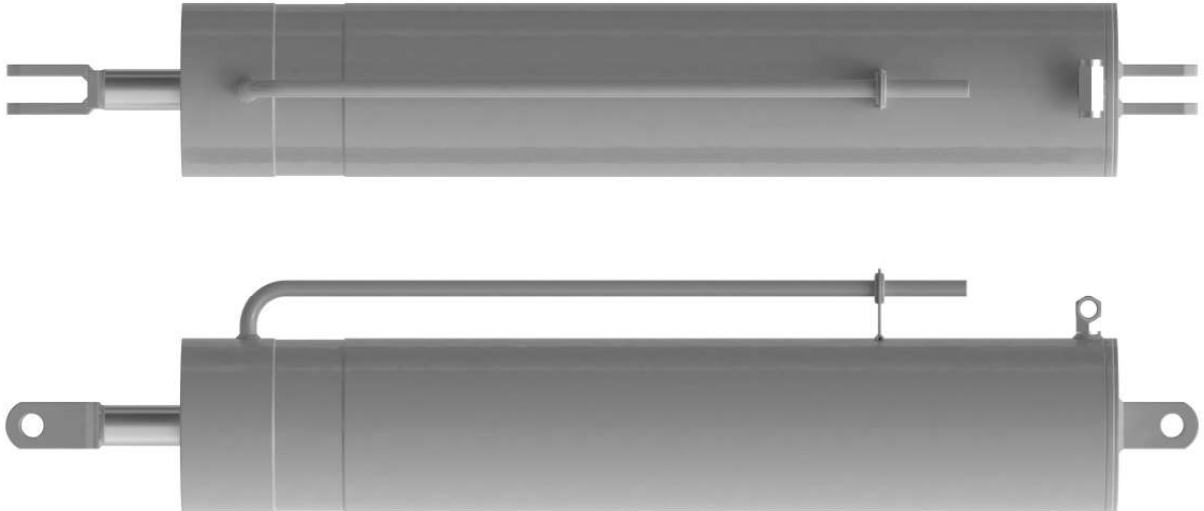
Ports: NPT

Port Plugs: High quality steel

Internal Seals: North American

Paint Finish: 2 part urethane black or custom colors

Testing: 100% full cycle tested



LIGHTWEIGHT ALUMINUM

RAM Lightweight Aluminum cylinders are durable and lightweight double-acting hydraulic cylinders. Specifically designed for applications where weight and space savings are critical, they are a reliable alternative to steel hydraulic cylinders. Aluminum cylinders are available in 2 ½ inch and 3 inch bore sizes, with stroke lengths up to 200 inches and pressure ratings up to 1800 PSI. These RAM hydraulic cylinders are designed to industry-standard dimensions. This standardization allows for easy exchange with existing cylinders on your equipment.

RAM aluminum cylinders are well suited for industries that require robust cylinders that are corrosion-resistant and lighter in weight. Manufacturing often utilizes aluminum cylinders in automation applications due to their high performance with frequent cycles. Aluminum cylinders are common in the transportation industry as they provide weight savings and perform reliably on various trailer applications. Another common use for lightweight cylinders is for recreational vehicle slides and their levelling systems.

The cylinder design includes features that maximize functionality and performance, including:

- High-quality aluminum body and internal parts are lightweight that resist rust.
- Hollow high strength chrome-plated steel rod provides weight savings and allows for an internal feed tube.
- Base fed ports with integrated oil lines save space and reduces the need for exposed hoses.
- Thread-locker used for all critical connections ensures dependability and ease of serviceability.
- High-quality urethane piston, rod, and wiper seals provides extrusion resistance.
- High strength nylon wear bands help maximize performance and prevent premature system wear.

Optional unique features on RAM's Lightweight Aluminum cylinder design include:

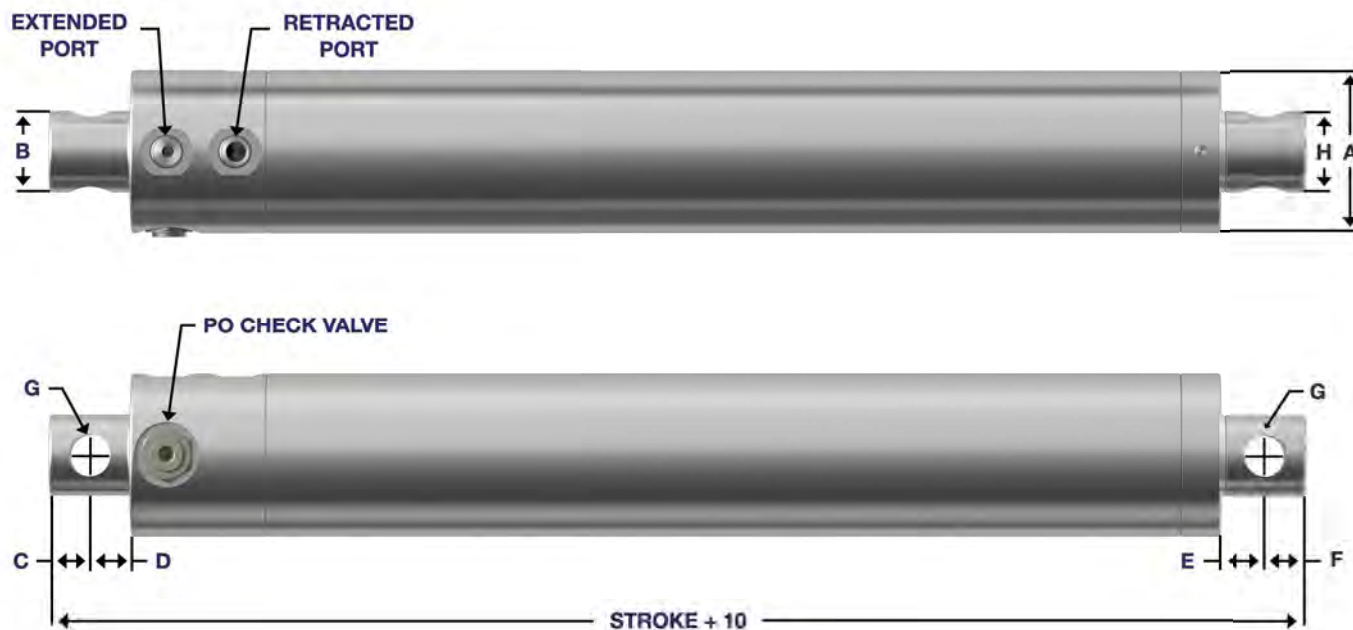
- A pilot operated check valve locks the cylinder by preventing any oil flow. This unique feature offers additional safety in the event of a line failure.
- In-line or 90 degree mounting provides flexibility and ensures optimal cylinder fit for any application.
- Alternative shaft finishes such as nitrided or induction hardened provide additional corrosion protection and extended shaft life in harsh environments.



BUILT TO YOUR SPECIFICATIONS

Rated Pressure: Up to 1800 PSI
Rod Size: 1.50"
Rod Material: High tensile SAE C1026/St52.3 cold drawn hard chrome plated tube ground and polished
Barrel Size: 2.50" or 3.00"
Barrel Material: Extruded aluminum tubing 6061-T6
Gland Material: 6061-T6 aluminum
Piston Material: 6061-T6 aluminum

End Mounts: Drilled rod and base for 3/4" pin
 Available in-line or 90 degrees to ports
Valves: Integrated PO check valve (optional)
Ports: SAE-6
Port Plugs: High quality steel
Internal Seals: North American
Paint Finish: Bare [2 part urethane optional]
Testing: 100% full cycle tested



Bore Size (inches)	A	B	C	D	E	F	G	H	Rod Diameter (inches)	Ports
2.50	3.00	1.50	0.75	1.25	1.25	0.75	0.765	1.44	1.50	SAE-6
3.00	3.50	1.50	0.75	1.25	1.25	0.75	0.765	1.44	1.50	SAE-6

Measurements for A, B, C, D, E, F, G, H are in inches.

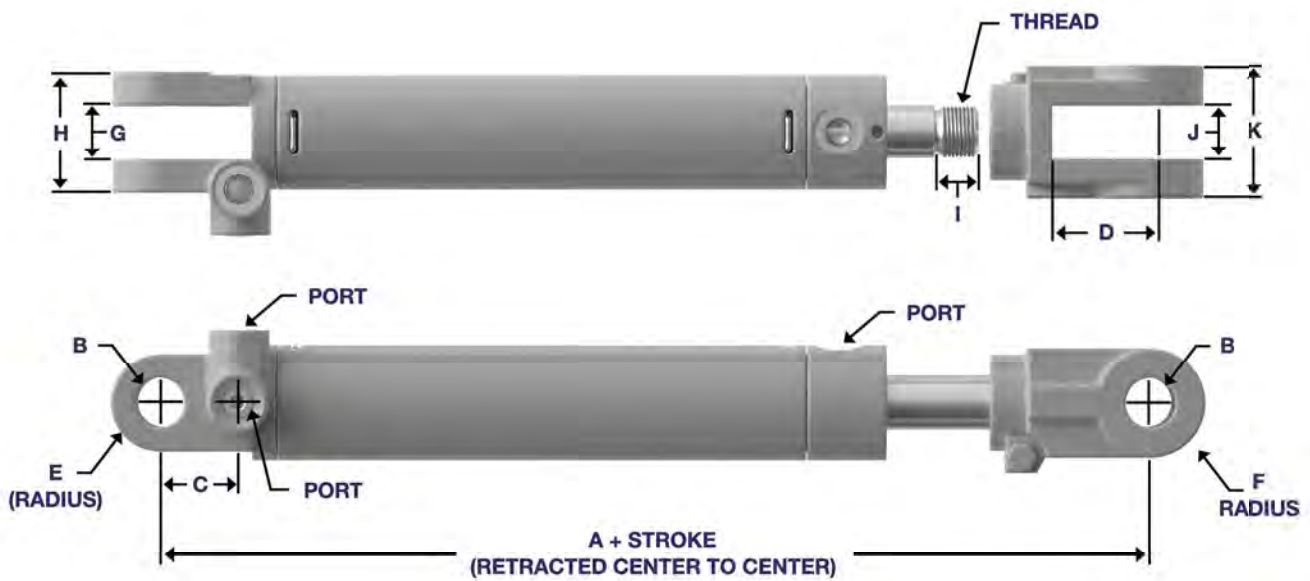
All specifications are subject to change without notice.

RAMLOK® WIRELOCK

The 3000 PSI rated RAMLOK® Hydraulic cylinders feature a unique construction technology that incorporates premium materials such as high tensile cold drawn tube while also utilizing unique production methods. For ease of maintenance the featured RAMLOK® internal steel rings securely lock the cylinder barrel to the head and base. This restricts movement within the cylinder allowing for quick and easy service access for seal replacement and cylinder maintenance.

RAMLOK® standard models have a bore size of 1/2" increments from 2" up to 4" and stroke ranges of 4" up to 26". Port alignment can be changed according to customer requirements.

Replacement parts and seal kits are readily available.



Bore Size (inches)	A	B	C	D	E	F	G	H	I	J	K	Ports	Threads
2.00	10.25*	1.015	1.88	2.00	1.00	1.13	1.13	2.50	1.13	1.13	2.75	SAE-6	1.125 - 12 UNF
2.50	10.25*	1.015	1.88	2.00	1.00	1.13	1.13	2.63	1.13	1.13	2.75	SAE-6	1.125 - 12 UNF
3.00	10.25*	1.015	1.88	2.00	1.00	1.13	1.13	2.63	1.13	1.13	2.75	SAE-8	1.250 - 12 UNF
3.50	10.25*	1.015	1.88	2.00	1.13	1.13	1.13	2.63	1.13	1.13	2.75	SAE-8	1.250 - 12 UNF
4.00	10.25*	1.015	1.88	2.00	1.13	1.13	1.13	2.81	1.13	1.13	2.75	SAE-8	1.250 - 12 UNF

Measurements for A, B, C, D, E, F, G, H, I, J, K are in inches.

All specifications are subject to change without notice.

STANDARD FEATURES

Intended Use: Double acting applications

Rated Pressure: 3000 PSI

Rod Material: High tensile SAE C1045,
ground and polished hard chrome plated

Barrel Material: High tensile SAE C1026
St52.3 cold drawn tube precision honed
for extended seal life

Gland Material: Ductile iron 65-45-12 (ASTM A536)

Piston Material: Ductile iron 65-45-12 (ASTM A536)

Piston Locknut: High tensile grade C

Pin & Pin Clip: High tensile zinc-plated steel

End Mounts: Female clevises

Clevis Clamp: Grade 8 bolt and nut

Ports: SAE

Port Plugs: High quality steel

Internal Seals: North American

Paint Finish: 2 part urethane black

Testing: 100% full cycle tested

Bore Size (inches)	RAM Part Number	Stroke (inches)	Rod Diameter (inches)	Pin Center to Center (inches)		Ports	Pin Diameter Nominal (inches)	Maximum Rated Pressure & Column Load on Full		Shipping Weight (lbs)
				Retracted	Extended			Pressure (PSI)	Load (lbf)	
2.00	R4505548C	4	1.125	14.25	18.25	SAE-6	1.000	3000	9425	14
	R4505549C	6	1.125	16.25	22.25					15
	R4505550C	8	1.125	18.25	26.25					16
	R4505551C*	8	1.125	20.25	28.25					16.5
	R4505552C	10	1.125	20.25	30.25					18
	R4505553C	12	1.125	22.25	34.25					19
	R4505554C	14	1.125	24.25	38.25			20		
	R4505555C	16	1.125	26.25	42.25			21		
	R4505556C	18	1.125	28.25	46.25			22		
	R4505557C	20	1.125	30.25	50.25			23		
	R4505558C	24	1.125	34.25	58.25			27		
	R4505559C	30	1.125	40.25	70.25			32		
R4505560C	36	1.125	46.25	82.25	37					
2.50	R4505561C	4	1.125	14.25	18.25	SAE-6	1.000	3000	14726	15
	R4505562C	6	1.125	16.25	22.25					17
	R4505563C	8	1.125	18.25	26.25					19
	R4505564C*	8	1.125	20.25	28.25					19.5
	R4505565C	10	1.125	20.25	30.25					21
	R4505566C	12	1.125	22.25	34.25					23
	R4505567C	14	1.125	24.25	38.25			25		
	R4505568C	16	1.250	26.25	42.25			27		
	R4505569C	18	1.250	28.25	46.25			29		
	R4505570C	20	1.250	30.25	50.25			31		
	R4505571C	24	1.250	34.25	58.25			34		
	R4505572C	30	1.250	40.25	70.25			39		
	R4505573C	36	1.250	46.25	82.25			44		

*Conforms to ASAE (American Society of Agricultural Engineers) specifications.

All specifications are subject to change without notice.
All weights are approximate shipping weights.

Bore Size (inches)	RAM Part Number	Stroke (inches)	Rod Diameter (inches)	Pin Center to Center (inches)		Ports	Pin Diameter Nominal (inches)	Maximum Rated Pressure & Column Load on Full		Shipping Weight (lbs)
				Retracted	Extended			Pressure (PSI)	Load (lbf)	
3.50	R4505587C	4	1.250	14.25	18.25	SAE-8	1.000	3000	28863	28
	R4505588C	6	1.250	16.25	22.25					30
	R4505589C	8	1.250	18.25	26.25					32
	R4505590C*	8	1.250	20.25	28.25					32.5
	R4505591C	10	1.250	20.25	30.25					34
	R4505592C	12	1.250	22.25	34.25					36
	R4505593C	14	1.250	24.25	38.25			2391	23004	38
	R4505594C	16	1.500	26.25	42.25			3000	28863	45
	R4505595C	18	1.500	28.25	46.25			2776	26709	49
	R4505596C	20	1.500	30.25	50.25			2036	19585	53
	R4505597C	24	1.500	34.25	58.25			1378	13255	59
	R4505598C	30	1.500	40.25	70.25			994	9563	65
	R4505599C	36	1.500	46.25	82.25					
4.00	R4505600C	4	1.375	14.25	18.25	SAE-8	1.000	3000	37699	32
	R4505601C	6	1.375	16.25	22.25					35
	R4505602C	8	1.375	18.25	26.25					38
	R4505603C*	8	1.375	20.25	28.25					38.5
	R4505604C	10	1.375	20.25	30.25					40
	R4505605C	12	1.375	22.25	34.25					43
	R4505606C	14	1.375	24.25	38.25			2680	33680	46
	R4505607C	16	1.750	26.25	42.25			3000	37699	52
	R4505608C	18	1.750	28.25	46.25			56		
	R4505609C	20	1.750	30.25	50.25			59		
	R4505610C	24	1.750	34.25	58.25			2887	36283	66
	R4505611C	30	1.750	40.25	70.25			1954	24556	76
	R4505612C	36	1.750	46.25	82.25			1410	17716	86

*Conforms to ASAE (American Society of Agricultural Engineers) specifications.

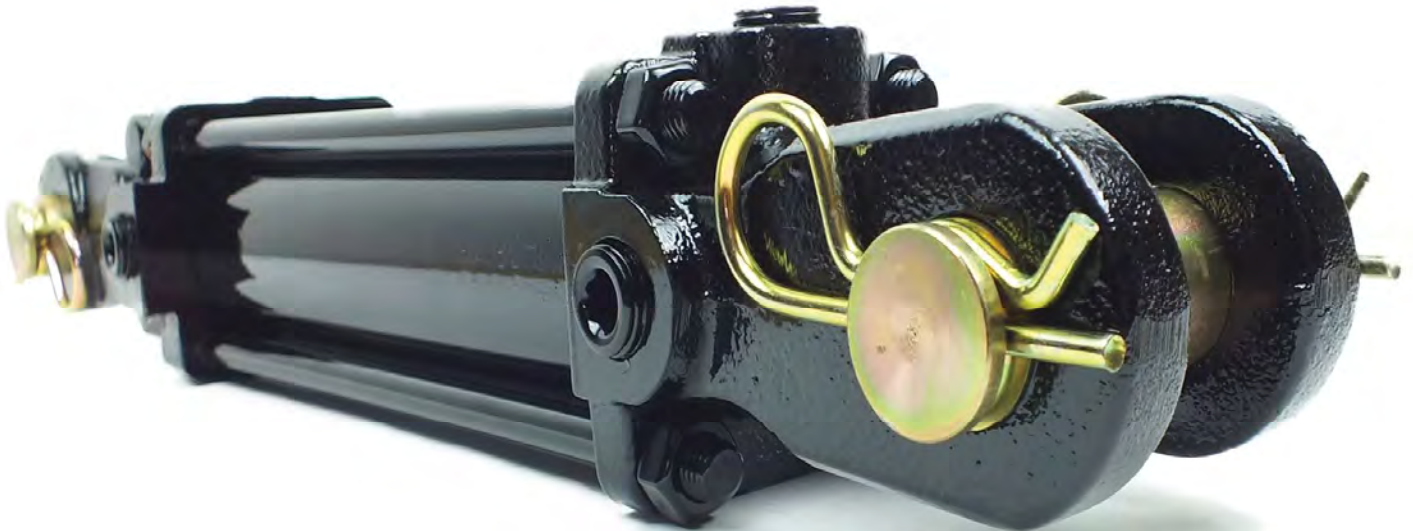
All specifications are subject to change without notice.
All weights are approximate shipping weights.

TyRod CYLINDERS

TyRod™ by RAM are a clevis type hydraulic cylinder designed to meet the requirements of both OEM and after-market users. These standard cylinders are designed to be utilized by many industries and various applications. TyRod cylinders provide many different configurations to help you find the right for your application. Available in 2500 PSI and 3000 PSI, with bore sizes from 2" to 4". Stroke lengths are also available up to 24".

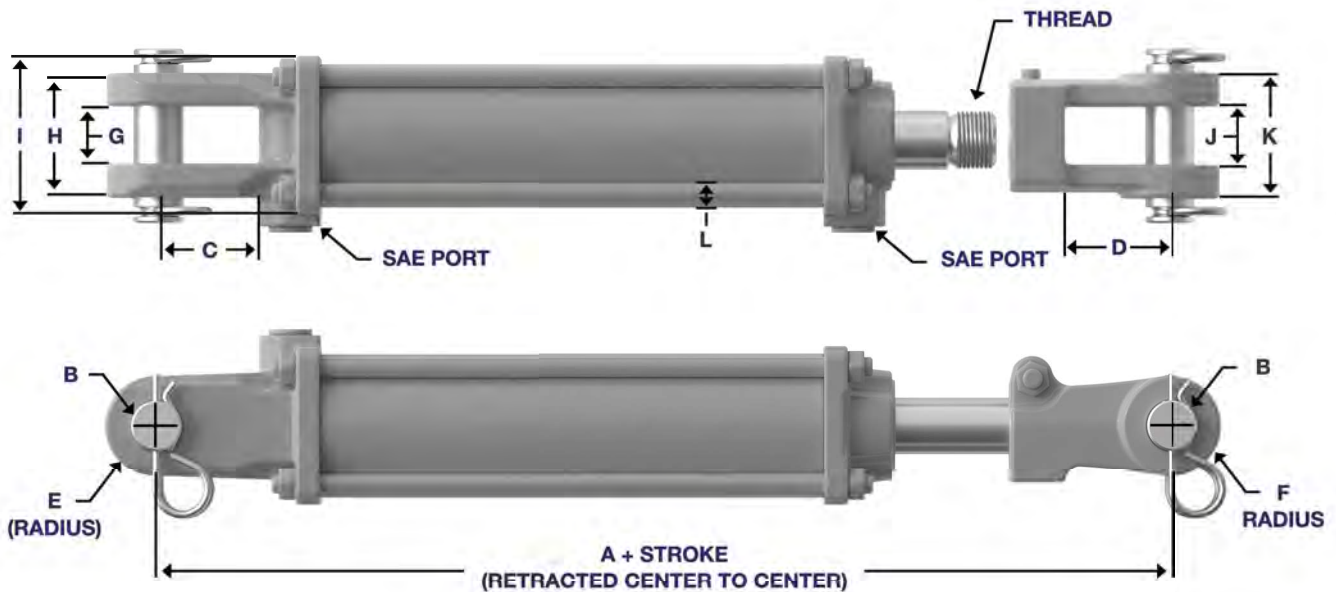
STANDARD FEATURES

Intended Use:	Double acting applications	Tie Rod:	High tensile ASTM 5140 rolled threads
Rated Pressure:	2500 or 3000 PSI	Pin & Pin Clip:	High tensile zinc-plated steel
Rod Material:	High tensile SAE C1045, ground and polished hard chrome plated	End Mounts:	Female clevis, ductile iron 65-45-12 (ASTM A536) with pins & clips included
Barrel Material:	High tensile SAE C1026/St52.3 cold drawn tube precision honed for extended seal life	Clevis Clamp:	Grade 10.9 bolt and nut
Gland Material:	Ductile iron 65-45-12 (ASTM A536)	Ports:	NPTF or SAE
Piston Material:	Ductile iron 65-45-12 (ASTM A536)	Port Plugs:	High quality steel
Piston Locknut:	High tensile grade 10	Internal Seals:	North American
		Paint Finish:	Black (or custom colors)
		Testing:	100% full cycle tested



TyRod[®] 3000 PSI

Tyrod™ by RAM 3000 PSI are heavy duty tie rod cylinders made with the highest quality materials and parts with a rated pressure of 3000 PSI. These cylinders provide reliable output of 3000 PSI continuous pressure. In addition to RAM standard features, these cylinders feature SAE ports.



Bore Size (inches)	A	B	C	D	E	F	G	H	I	J	K	L	Ports	Threads
2.00	10.25*	1.00	2.00	2.13	1.00	1.00	1.17	2.50	2.76	1.17	2.50	0.39	SAE-8	1 1/8" - 12 UNF
2.50	10.25*	1.00	2.00	2.13	1.00	1.00	1.17	2.50	3.30	1.17	2.50	0.39	SAE-8	1 1/8" - 12 UNF
3.00	10.25*	1.00	2.00	2.13	1.00	1.13	1.17	2.56	3.80	1.17	2.72	0.47	SAE-8	1 1/4" - 12 UNF
3.50	10.25*	1.00	2.00	2.13	1.13	1.13	1.17	2.56	4.25	1.17	2.72	0.55	SAE-8	1 1/4" - 12 UNF
4.00	10.25*	1.00	2.00	2.13	1.25	1.13	1.17	2.76	4.92	1.17	2.72	0.63	SAE-8	1 1/4" - 12 UNF

Measurements for A, B, C, D, E, F, G, H, I, J, K, L are in inches.

*For the standard ASAE (8" stroke) cylinders this dimension is 12.25".
All specifications are subject to change without notice.

TyRod 3000 PSI

Bore Size (inches)	RAM Part Number	Stroke (inches)	Rod Diameter (inches)	Pin Center to Center (inches)		Ports	Pin Diameter Nominal (inches)	Maximum Rated Pressure & Column Load on Full		Shipping Weight (lbs)
				Retracted	Extended			Pressure (PSI)	Load (lbf)	
2.00	R4507471*	8	1.125	20.25	28.25	SAE-8	1.000	3000	9425	19
2.50	R4507475*	8	1.125	20.25	28.25	SAE-8	1.000	3000	14725	22
3.00	R4507479*	8	1.250	20.25	28.25	SAE-8	1.000	3000	21205	29
	R4507481	16	1.500	26.25	42.25					37
3.50	R4507483*	8	1.500	20.25	28.25	SAE-8	1.000	3000	28860	31
	R4507485	16	1.500	26.25	42.25					36
4.00	R4507487*	8	1.500	20.25	28.25	SAE-8	1.000	3000	37695	39

*Conforms to ASAE (American Society of Agricultural Engineers) spe

All specifications are subject to change without notice.
All weights are approximate shipping weights.

TYROD PARTS

RAM TyRod Cylinder Seal Kits			
Bore Size (inches)	RAM Part Number	Rod Diameter (inches)	Shipping Weight (lbs)
2.00	R3607007	1.125	0.04
2.50	R3607013	1.125	0.05
3.00	R3607026	1.250	0.06
	R3607033	1.500	0.07
3.50	R3607039	1.250	0.07
	R3607046	1.500	0.07
4.00	R3607052	1.500	0.07
	R3607061	2.000	0.08

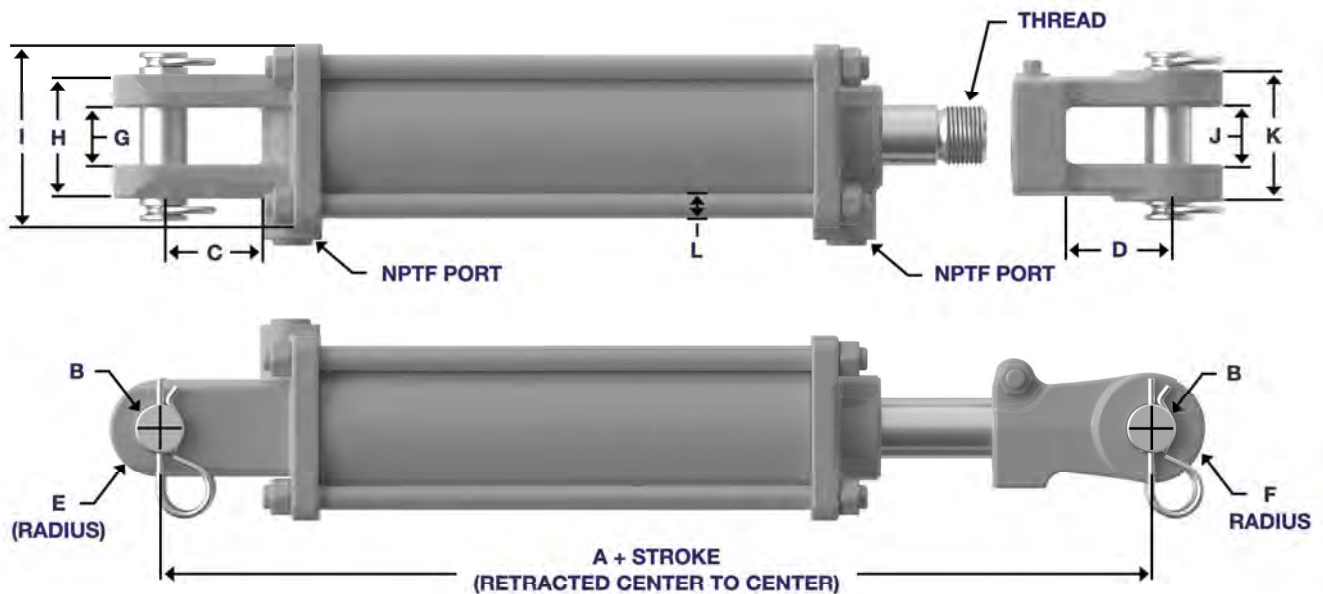
All specifications are subject to change without notice.
All weights are approximate shipping weights.

RAM TyRod Cylinder Components			
Size	Component	RAM Part Number	Shipping Weight (lbs)
Fits 1 1/8" Shaft	Shaft Clevis	R7600456	3.30
Fits 1 1/4" Shaft	Shaft Clevis	R7600455	3.30
Fits 1 1/2" Shaft	Shaft Clevis	R7600455	3.30
Fits 2" Shaft	Shaft Clevis	R7600455	3.30
1" x 2 7/8"	Pin	R3006631	0.80
Hairpin Clip	Clip	R3006300	0.02

All specifications are subject to change without notice.
All weights are approximate shipping weights.

TyRod[®] 2500 PSI

Tyrod™ by RAM 2500 PSI are standard duty tie rod cylinders made with the highest quality materials and parts with a rated pressure of 2500 PSI. These cylinders provide reliable output of 2500 PSI continuous pressure. In addition to RAM standard features, these cylinders feature NPTF ports.



Bore Sizes (inches)	A	B	C	D	E	F	G	H	I	J	K	L	Ports	Threads
2.00	10.25*	1.00	2.00	2.13	1.00	1.00	1.13	2.50	2.76	1.17	2.50	0.39	3/8 NPTF	1 1/8" - 12 UNF
2.50	10.25*	1.00	2.00	2.13	1.00	1.00	1.13	2.50	3.30	1.17	2.50	0.39	3/8 NPTF	1 1/8" - 12 UNF
3.00	10.25*	1.00	2.00	2.13	1.00	1.13	1.13	2.56	3.80	1.17	2.72	0.47	1/2 NPTF	1 1/4" - 12 UNF
3.50	10.25*	1.00	2.00	2.13	1.13	1.13	1.17	2.56	4.25	1.17	2.72	0.55	1/2 NPTF	1 1/4" - 12 UNF
4.00	10.25*	1.00	2.00	2.13	1.25	1.13	1.17	2.76	4.92	1.17	2.72	0.63	1/2 NPTF	1 1/4" - 12 UNF

Measurements for A, B, C, D, E, F, G, H, I, J, K, L are in inches.

*For the standard ASAE (8" stroke) cylinders this dimension is 12.25".

All specifications are subject to change without notice.

Bore Size (inches)	RAM Part Number	Stroke (inches)	Rod Diameter (inches)	Pin Center to Center (inches)		Ports	Pin Diameter Nominal (inches)	Maximum Rated Pressure & Column Load on Full		Shipping Weight (lbs)		
				Retracted	Extended			Pressure (PSI)	Load (lbf)			
2.00	R4507001	6	1.125	16.25	22.25	3/8 NPTF	1.000	2500	7855	18		
	R4507003*	8	1.125	20.25	28.25					19		
	R4507004	10	1.125	20.25	30.25					20		
	R4507005	12	1.125	22.25	34.25					21		
	R4507007	16	1.125	26.25	42.25					23		
	R4507010	24	1.125	34.25	58.25			2190	6850	27		
2.50	R4507016*	8	1.125	20.25	28.25	3/8 NPTF	1.000	2500	12270	22		
	R4507017	10	1.125	20.25	30.25					22		
	R4507018	12	1.125	22.25	34.25					24		
	R4507020	16	1.125	26.25	42.25					27		
	R4507021	18	1.125	28.25	46.25					28		
	R4507023	24	1.125	34.25	58.25			2125	10435	33		
3.00	R4507029*	8	1.250	20.25	28.25	1/2 NPTF	1.000	2500	17670	29		
	R4507030	10	1.250	20.25	30.25					28		
	R4507031	12	1.250	22.25	34.25					29		
	R4507033	16	1.250	26.25	42.25					37		
	R4507034	18	1.250	28.25	46.25					2340	16560	35
	R4507036	24	1.500	34.25	58.25			2500	17670	46		
3.50	R4507042*	8	1.250	20.25	28.25	1/2 NPTF	1.000	2500	24055	31		
	R4507043	10	1.250	20.25	30.25					30		
	R4507044	12	1.250	22.25	34.25					33		
	R4507046	16	1.250	26.25	42.25					2060	19840	36
	R4507047	18	1.250	28.25	46.25					1720	16540	40
	R4507049	24	1.500	34.25	58.25			2250	21645	51		
4.00	R4507055*	8	1.500	20.25	28.25	1/2 NPTF	1.000	2500	31415	39		
	R4507056	10	1.500	20.25	30.25					40		
	R4507057	12	1.500	22.25	34.25					43		
	R4507059	16	1.500	26.25	42.25					48		
	R4507060	18	1.500	28.25	46.25					49		
	R4507062	24	2.000	34.25	58.25					65		

*Conforms to ASAE (American Society of Agricultural Engineers) specifications.

AB2:L35II specifications are subject to change without notice.
All weights are approximate shipping weights.

HYDRAULIC TESTING SERVICES

RAM Industries recognizes that hydraulic cylinders perform a critical function in the effective and efficient operation of OEM equipment. As your partner and expert in hydraulic cylinder design and manufacturing, RAM offers sophisticated testing services to assist companies in verifying their cylinder design and performance specifications.

Testing services are made available through RAM's state-of-the-art onsite cylinder testing equipment – capable of evaluating your R&D or prototype cylinders, as well as current production run cylinder models. Buckling, friction, endurance (cycle and impulse), drift and hydraulic proof pressure tests can be performed on a wide range of cylinder designs and sizes based on specific customer test parameters. Tests can also be conducted using SAE Standard testing methodologies (as specified in J1334, J1335, J1336).

RAM's knowledgeable engineering team will work directly with your company to ensure cylinder test setup, monitoring and reporting is based on your custom testing requirements.

FULLY CUSTOMIZED TESTING PARAMETERS

- Various testing pressures (min/max, operating)
- Wide range of mechanical loads
- Oil temperature specification
- Partial or full stroke endurance testing
- Drift tests at various stages of testing

MAXIMUM TECHNICAL RANGE OF TEST CAPABILITIES

- **Testing Flow Capacity:** 60 gpm (227 lpm)
- **Hydraulic Testing Pressure:** 5,000 psi (345 bar)
- **Mechanical Load Capability:** 100,000 lbs (45,360 kg)
- **Cylinder Stroke:** up to 48" (122 cm)
- **Bore Diameter:** up to 9"
- **Oil Temperature Range:** 122–230 °F (50–110 °C)

AVAILABLE TESTS

- Column Load (Buckling) Test
- Cycle (Endurance) Test
- Cylinder Friction Test
- Hydraulic Proof Pressure Test
- Impulse Endurance Test
- Drift Test

CYLINDER TYPES

- **Cylinder Designs:** Welded, tie rod, wirelock, NFPA
- **All Applications:** Agriculture, industrial, mining, mobile equipment, forestry, material handling, transportation, oil & gas, construction, etc.
- **Cylinder Mounts:** Any cylinder mount is accepted; RAM provides custom fixturing for testing
- **Shafts:** Chrome, nitro, stainless, hollow

TESTING SERVICES INCLUDE:

- Hydraulic cylinder testing and reporting service
- Test setup, including cylinder fixturing and sample test run data collection if requested
- Test monitoring including visual, photographs (at setup, check points, and final inspection)
- Customized test parameters and test schematic
- 24/7 endurance testing for time-sensitive requirements





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