



Mobile Cylinder Div. Quick Reference Guide

Catalog HY18-0031

aerospace
climate control
electromechanical
filtration
fluid & gas handling
hydraulics
pneumatics
process control
sealing & shielding



ENGINEERING YOUR SUCCESS.



WARNING - USER RESPONSIBILITY

FAILURE OR IMPROPER SELECTION OR IMPROPER USE OF THE PRODUCTS DESCRIBED HEREIN OR RELATED ITEMS CAN CAUSE DEATH, PERSONAL INJURY AND PROPERTY DAMAGE.

This document and other information from Parker-Hannifin Corporation, its subsidiaries and authorized distributors provide product or system options for further investigation by users having technical expertise.

The user, through its own analysis and testing, is solely responsible for making the final selection of the system and components and assuring that all performance, endurance, maintenance, safety and warning requirements of the application are met. The user must analyze all aspects of the application, follow applicable industry standards, and follow the information concerning the product in the current product catalog and in any other materials provided from Parker or its subsidiaries or authorized distributors.

To the extent that Parker or its subsidiaries or authorized distributors provide component or system options based upon data or specifications provided by the user, the user is responsible for determining that such data and specifications are suitable and sufficient for all applications and reasonably foreseeable uses of the components or systems.

Offer of Sale

The items described in this document are hereby offered for sale by Parker Hannifin Corporation, its subsidiaries or its authorized distributors. This offer and its acceptance are governed by the provisions stated in the "Offer of Sale".

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Crossover and Application Data is for Reference Purpose Only. No Other Conditions are Expressed or Implied.
Note: It is the Users Responsibility to Verify if the Replacement Cylinder is Interchangeable.
Note: In some applications, modifications may be required for proper cylinder installation.





Cylinders were among the first hydraulic products of Commercial Hydraulics beginning in 1928. In 2000 Commercial Intertech Corp. merged with the Parker Hannifin Corp. Today, the Parker Mobile Cylinder Division is recognized as one of the largest independent manufacturers of hydraulic cylinders for mobile equipment and a leading supplier to refuse, mining, truck, material handling and positioning markets. Parker's Mobile Cylinder Division products include double- and single-acting telescopic cylinders, rod cylinders and "smart cylinders" with internal electronic controls.

Additionally, the company enjoys a reputation for quality custom built cylinders that demonstrate engineering know how and adept manufacturing. Cylinders represent a significant portion of the company's Hydraulic Systems sales - their contribution has resulted in significant capital expenditures geared to establish Parker's Mobile Cylinder Division as the world's leading manufacturer of hydraulic cylinders.

About our Quick Reference and Application Guide . . .

It's our goal to provide our customers with the highest quality cylinders. If the need arises for a cylinder not listed in this guide, please furnish us the following information and we'll do our best to provide a new or replacement.

- | | |
|--|----------------------------|
| * OEM identification number | * Retract or closed length |
| * Single- or double-acting type | * Stroke length |
| * Outside diameter of the largest moving stage or rod and bore diameters | * Extend or open length |
| * Number of moving stages | * Pineye sizes |
| * Application | * Plunger mount type |
| | * Base mount type |
- Please refer to the cylinder specification data forms for more information.**

Parker's Mobile Cylinder Division has complete manufacturing facilities to fill all your cylinder needs from 1 piece to 1000 pieces. If you're looking for a prototype, a special cylinder, or a production run, Parker's Mobile Cylinder Division is the place to call.

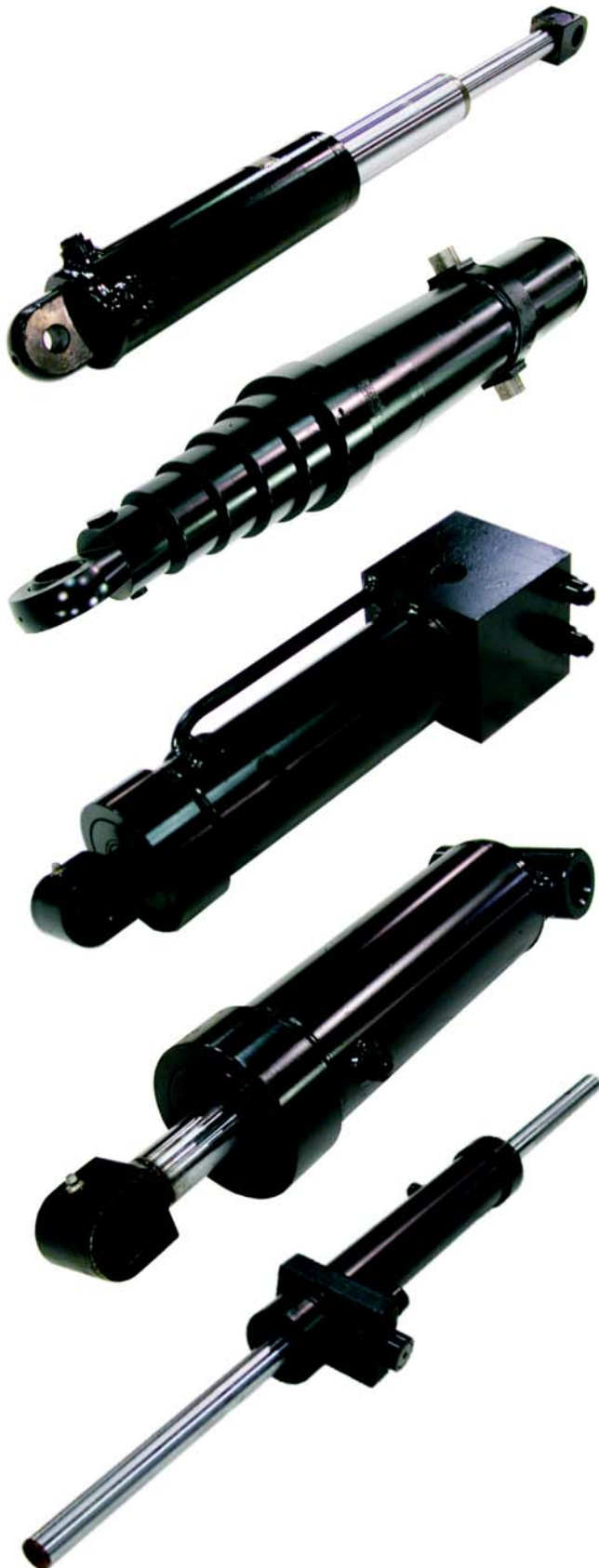
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MOBILE CYLINDER DIVISION PRODUCTS & CAPABILITIES

- **TELESCOPIC CYLINDERS**
Single Acting
Double Acting
- **SINGLE STAGE “Rod Type” CYLINDERS**
Single Acting
Double Acting
- **BUILD TO CUSTOMER PRINTS OR PER APPLICATION SPECIFICATIONS**
- **BORE SIZES UP TO 20” DIAMETER**
- **STROKE LENGTHS UP TO 500”**
- **OPERATING PRESSURES UP TO 10,000 PSI**
- **VARIOUS OPERATING FLUIDS**
- **BATCH SIZES 1PC TO 100’s**
- **VARIOUS MATERIALS & COATINGS**
Stainless Steel
Electroless Nickel
Nitriding
Chrome
Double Chrome
- **TYPICAL OPTIONS**
Load Holding Valves
Electro-Hydraulic Transducers
End of Stroke Hydraulic Cushions
Protective Rod Boots
Proximity Switches
Flow Controls
Flow Fuses

Quick Reference Guide

Accurate

HH-1	D62LB-5-80
HH-2	D72LB-9-80
HP-HH001	D62LB-5-80
HP-HH002	D72LB-9-80
MF-51	D72LB-9-80

Anthony Midwest Body

H070105	S63DC-97-111 CM26
H0701052	S63DC-97-111 CM26
H0710432	S73DC-66-110 CM26
H075018	S73DC-66-124 CM23
H0750182	S73DC-66-124 CM26
H130409	S63DC-101-140 CM26

Beall

A3602	S53DC-65-126
A3660	S63DC-101-140

Benton Harbor

A89646	D70LN-5-90
P89645	D70LN-5-80
P89648	D60DB-23-72

Bme Engineering Co

P-60-OR-176T Hoist	SD63CB-23-118
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Caterpillar

246-7145	S84DC-66-140
246-7332	S63MB-8-140
246-7359	S85MC-48-250
246-7444	S73DC-66-140
246-7456	S74DC-74-156
246-7564	S63DC-97-123
246-7594	S64DB-12-135

Commercial / Parker

3782000014	3782000014
B4079	D35LD-7-16
B4100	D25LD-2-90
B4103	D45CC-19-41.50
B4388	D20DD-8-95
B4777	D30CD-13-28
B5109	D40CB-10-42
B5162	D30CC-17-28.19
B5420	D62LB-5-80
B5429	D20DD-6-6.25
B5489	D50DD-28-39.50
B5501	D35DD-7-17.88
B5546	D25LL-14-42
B5548	D40CL-13-45.38
B5550	D45LD-7-45.38
B5551	D35LD-5-19
B5609	D40MD-1-72
B5642	D30LD-10-36
B5653	D30CC-19-16.00
B5654	D30CC-20-8.00
B5655	D30CC-18-8.00
B5788	D45CC-20-46
B5790	D25LL-15-84
B5799	D17AE-2-71.88
B5845	D70DD-9-79
B5866	D30CE-11-18.50
B5873	D50CC-25-43
B5947	D40DD-19-22.50
B6044	B6044
B6148	D35CC-28-38
B6151	D20DD-8-95
B6231	D45DD-10-52.75
C3805	D50CB-8-27
C3810	D60CD-5-34
C3814	D60CD-5-34
C3865	D40DB-7-28.5
C3870	D60DC-12-42.62
C3872	D50CC-27-36
C3878	D55CC-10-24.25
C3880	D60DD-20-79
C3881	D70DD-9-79
C3882	D60CF-3-32.38

Commercial / Parker

C3884	S41LC-1-39.38
C3919	D45CD-5-49.12
C3926	D40CD-8-22
C4101	D40CD-14-25
C4208	D32LL-11-38
C4435	D30LD-8-33.38
C4444	D60DB-23-72
C4497	D32LL-11-38
C4622	D45CC-19-41.50
C4774	D65CC-9-66
C4793	D55CC-6-63
C5220	D32LL-11-38
D20DD-4-6.25	D20DD-6-6.25
D20DD-6-6.25	D20DD-6-6.25
D30CD-10-28	D30CD-13-28
D30LD-2-33.38	D30LD-8-33.38
D30LD-7-33.38	D30LD-8-33.38
D35CC-16-26	D35CC-27-26
D35DD-1-17.88	D35DD-7-17.88
D35LC-2-2.00	3782000014
D4094	D60BC-5-30.31 495
D40CB-7-42	D40CB-10-42
D40CD-16-29.50	D40CD-16-29.50
D40CD-8-22	D40CD-8-22
D40CL-2-39.38	S41LC-1-39.38
D40DB-3-25.62	D40DB-7-25.62
D40DB-3-28.5	D40DB-7-28.5
D40DB-4-25.62	D40DB-7-25.62
D40DB-6-25.62	D40DB-7-25.62
D40DB-6-28.5	D40DB-7-28.5
D40LD-3-24.75	D40LD-10-24.75
D40LD-5-24.75	D40LD-11-24.75
D40MD-1-72	D40MD-1-72
D4145	SD53CC-48-164
D4171	D55DD-14-38.62
D4172	D50DD-29-25.62
D4190	S31CB-2-42
D4210	D60DC-13-65.75
D4265	D50DD-30-32.50
D4266	D45DD-9-23
D4398	D35CC-27-26
D4434	D45CD-5-49.12
D4482	D55CC-12-49.12
D4496	D45CC-20-46
D4541	D50DD-32-37.25
D45CC-15-41.50	D45CC-19-41.50
D45CD-1-49.13	D45CD-5-49.12
D45CD-2-49.12	D45CD-4-49.12
D45CD-3-49.12	D45CD-5-49.12
D50DD-24-39.50	D50DD-28-39.50
D55CC-1-49.13	D55CC-12-49.12
D55CC-3-49.13	D55CC-12-49.12
D60BC-2-30.31	D60BC-5-30.31
D60BC-3-30.31	D60BC-5-30.31
D60BC-4-30.31	D60BC-5-30.31
D60BC-5-30.31	D60BC-5-30.31
D60DB-4-72	D60DB-23-72
D60DB-7-72	D60DB-23-72
D60DC-10-30.50	D60BC-5-30.31 495
D60DC-11-30.50	D60BC-5-30.31 536
D60DC-1-42.62	D60DC-12-42.62
D60DC-7-42.62	D60DC-12-42.62
D60DD-11-79	D60DD-20-79
D60DD-14-79	D60DD-20-79
D60DD-16-79	D60DD-20-79
D60DD-20-79	D60DD-20-79
D62DB-7-72	D60DB-23-72
D62DC-10-30	D60BC-5-30.31 495
D62LB-2-81	D62LB-5-80
D62LB-3-79	D62LB-5-80
D62LB-3-80	D62LB-5-80
D62LB-4-80	D62LB-5-80
D62LB-5-80	D62LB-5-80
D62MT-2-80	D62LB-5-80
D65CC-10-66	D65CC-9-66
D70DD-5-79	D70DD-9-79
D70DD-6-79	D70DD-9-79
D70DD-9-79	D70DD-9-79

Commercial / Parker

D70LN-1-80	D70LN-5-80
D70LN-2-80	D70LN-5-80
D70LN-2-90	D70LN-5-90
D70LN-4-80	D70LN-5-80
D72DB-10-79	D70DD-9-79
D72DB-3-25	D72DB-7-25
D72DB-4-25	D72DB-7-25
D72DB-7G-25	D72DB-7-25
D72LB-1-80	D72LB-9-80
D72LB-3-80	D72LB-9-80
D72LB-5-80	D72LB-9-80
D72LB-6-81	D72LB-9-80
D72LB-8-80	D72LB-9-80
D72LP-1-80	D70LN-5-80
D72MI-1-80	D72LB-9-80
D72MT-1-80	D72LB-9-80
D84DA-1-25	D84DB-7-25
D84DB-3-25	D84DB-7-25
D84DB-4-25	D84DB-7-25
D84DB-4-25-1	D84DB-7-25-1
D84DB-5-25	D84DB-7-25
D84DB-5-25-1	D84DB-7-25-1
D84DB-7G-25	D84DB-7-25
D84DB-7G-25-1	D84DB-7-25-1
S32DB-1-43	S32DB-3-42.62
S32DB-1-43 CM72	S32DB-3-42.62 CM72
S32DB-1-50	S32DB-3-50
S32DB-1-50 CM72	S32DB-3-50 CM72
S41CL-2-39.38	S41LC-1-39.38
S42CC-12-40	S42CC-19-40
S42DB-5-43	S42DB-8-43
S42DB-5-43 CM72	S42DB-8-43 CM72
S42DB-5-51	S42DB-8-51
S42DB-5-51 CM72	S42DB-8-51 CM72
S42MB-1-82	S42MB-3-90
S42MB-1-83	S42MB-3-90
S42MB-1-86	S42MB-3-90
S42MB-1-90	S42MB-3-90
S42MB-3-83	S42MB-3-90
S43DB-2-75	S43DB-3-75
S43DB-4-75	S43DB-3-75
S52CC-34-54.62	S52CC-41-54.62
S52CC-34-67.25	S52CC-41-67.25
S52CC-37-54.62	S52CC-41-54.62
S52CC-38-67.25	S52CC-41-67.25
S52DB-11-67.50	S52DB-9-67.50
S53DB-1-103	S53DB-20-103
S53DB-13-90	S53DB-18-90
S53DB-18-60	S53DB-13-60
S53DB-3-75	S53DC-66-72
S53DB-8-103	S53DB-20-103
S53DC-10-72	S53DC-66-72
S53DC-10-84	S53DC-66-84
S53DC-11-104	S53DC-65-104
S53DC-11-107	S53DC-65-107
S53DC-11-120	S53DC-65-120
S53DC-11-126	S53DC-65-126
S53DC-11-130	S53DC-65-130
S53DC-11G-107	S53DC-65-107
S53DC-11G-126	S53DC-65-126
S53DC-12-104	S53DC-65-104
S53DC-12-120	S53DC-65-120
S53DC-12-130	S53DC-65-130
S53DC-12-84	S53DC-66-84 CM8
S53DC-14-72	S53DC-66-72
S53DC-14-84	S53DC-66-84
S53DC-14G-72	S53DC-66-72
S53DC-14G-84	S53DC-66-84
S53DC-15-105	S53DC-68-105
S53DC-15-120	S53DC-68-120
S53DC-15-123	S53DC-68-123
S53DC-15-99	S53DC-68-99
S53DC-15G-105	S53DC-68-105
S53DC-15G-120	S53DC-68-120
S53DC-15G-123	S53DC-68-123
S53DC-15G-99	S53DC-68-99
S53DC-19-90	S53DB-12-90
S53DC-3-72	S53DC-66-72

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Note: It is the Users Responsibility to Verify if the Replacement Cylinder is Interchangeable.

Note: In some applications, modifications may be required for proper cylinder installation.



Quick Reference Guide

Commercial / Parker

S53DC-3-84.....	S53DC-66-84
S53DC-4-107.....	S53DC-65-107
S53DC-4-126.....	S53DC-65-126
S53DC-5-107.....	S53DC-65-107
S53DC-5-126.....	S53DC-65-126
S53DC-60-81.....	S53DC-60-81
S53DC-6-105.....	S53DC-68-105
S53DC-6-120.....	S53DC-68-120
S53DC-6-123.....	S53DC-68-123
S53DC-65-104.....	S53DC-65-104
S53DC-6-99.....	S53DC-68-99
S53DC-8-104.....	S53DC-65-104
S53DC-8-120.....	S53DC-65-120
S53DC-8-130.....	S53DC-65-130
S53DC-8-84.....	S53DC-66-84 CM8
S53DC-9-72.....	S53DC-66-72
S53DC-9-84.....	S53DC-66-84
S53MB-1-120.....	S53MB-3-120
S53MB-3-120.....	S53MB-3-120
S53MB-5-90.....	S53MB-5-90
S62CC-15-69.....	S62CC-32-69
S62CC-30-69.....	S62CC-32-69
S63CC-22-111.....	S63DC-97-111
S63CC-22-123.....	S63DC-97-123
S63CC-22-80.....	S63DC-101-77
S63DC-101-130.....	S63DC-96-130
S63DC-101-82.50.....	S63DC-96-82.50
S63DC-22-111.....	S63DC-97-111
S63DC-22-123.....	S63DC-97-123
S63DC-22-80.....	S63DC-101-77
S63DC-22-87.....	S63DC-101-92
S63DC-22-90.....	S63DC-101-92
S63DC-22-95.....	S63DC-101-104
S63DC-23-108.....	S63DC-97-111
S63DC-23-128.....	S63DC-96-130
S63DC-26-111.....	S63DC-97-111
S63DC-27-111.....	S63DC-97-111 CM9
S63DC-28-120.....	S63DC-101-120 CM45
S63DC-30-111.....	S63DC-97-111
S63DC-30-123.....	S63DC-97-123
S63DC-31-107.....	S63DC-101-107 CM37
S63DC-3-111.....	S63DC-97-111
S63DC-31-126.....	S63DC-97-123 CM37
S63DC-32-120.....	S63DC-102-120
S63DC-32-126.....	S63DC-102-126
S63DC-32-138.....	S63DC-102-138
S63DC-32-162.....	S63DC-102-162
S63DC-33-105.....	S63DC-101-107
S63DC-33-120.....	S63DC-101-120
S63DC-33-132.....	S63DC-96-130
S63DC-34-86.....	S63DC-101-86
S63DC-37-82.....	S63DC-96-82.50
S63DC-41-120.....	S63DC-101-120 CM9
S63DC-41-130.....	S63DC-96-130 CM9
S63DC-41-140.....	S63DC-101-140 CM9
S63DC-44-111.....	S63DC-97-111
S63DC-44-123.....	S63DC-97-123
S63DC-44G-111.....	S63DC-97-111
S63DC-44G-123.....	S63DC-97-123
S63DC-45-120.....	S63DC-102-120
S63DC-45-126.....	S63DC-102-126
S63DC-45-138.....	S63DC-102-138
S63DC-45-150.....	S63DC-102-150
S63DC-45-162.....	S63DC-102-162
S63DC-45G-120.....	S63DC-102-120
S63DC-45G-126.....	S63DC-102-126
S63DC-45G-138.....	S63DC-102-138
S63DC-45G-162.....	S63DC-102-162
S63DC-46-107.....	S63DC-101-107 CM37
S63DC-46-126.....	S63DC-97-123 CM37
S63DC-47-104.....	S63DC-101-104
S63DC-47-107.....	S63DC-101-107
S63DC-47-120.....	S63DC-101-120
S63DC-47-126.....	S63DC-101-126
S63DC-47-130.....	S63DC-96-130
S63DC-47-140.....	S63DC-101-140
S63DC-47-150.....	S63DC-101-150
S63DC-47-77.....	S63DC-101-77

Commercial / Parker

S63DC-47-82.....	S63DC-96-82.50
S63DC-47-86.....	S63DC-101-86
S63DC-47-92.....	S63DC-101-92
S63DC-47G-104.....	S63DC-101-104
S63DC-47G-107.....	S63DC-101-107
S63DC-47G-120.....	S63DC-101-120
S63DC-47G-126.....	S63DC-101-126
S63DC-47G-130.....	S63DC-96-130
S63DC-47G-140.....	S63DC-101-140
S63DC-47G-77.....	S63DC-101-77
S63DC-47G-82.....	S63DC-96-82.50
S63DC-47G-86.....	S63DC-101-86
S63DC-48-120.....	S63DC-101-120
S63DC-48-130.....	S63DC-96-130 CM9
S63DC-48-140.....	S63DC-101-140 CM9
S63DC-50-105.....	S63DC-101-107
S63DC-50-120.....	S63DC-101-120
S63DC-50-132.....	S63DC-96-130
S63DC-52-77.....	S63DC-101-77
S63DC-53-86.....	S63DC-101-86
S63DC-5-82.....	S63DC-96-82.50 CM11
S63DC-66-111.....	S63DC-96-111
S63DC-66-123.....	S63DC-96-130
S63DC-66-130.....	S63DC-96-130
S63DC-66-82.....	S63DC-96-82.50
S63DC-6-82.....	S63DC-96-82.50 CM11
S63DC-72-130.....	S63DC-96-130
S63DC-76-130.....	S63DC-96-130
S63DC-81-111.....	S63DC-96-111
S63DC-81-82.50.....	S63DC-96-82.50
S63DC-83-103.94.....	S63DC-101-104
S63DC-83-107.....	S63DC-101-107
S63DC-83-120.....	S63DC-101-120
S63DC-83-126.....	S63DC-101-126
S63DC-83-130.....	S63DC-96-130
S63DC-83-140.....	S63DC-101-140
S63DC-83-150.....	S63DC-101-150
S63DC-83-77.....	S63DC-101-77
S63DC-83-82.....	S63DC-96-82.50
S63DC-83-86.....	S63DC-101-86
S63DC-83-92.....	S63DC-101-92
S63DC-84-106.....	S63DC-60-106
S63DC-84-125.....	S63DC-60-125
S63DC-84-79.12.....	S63DC-60-79.12
S63DC-84-92.....	S63DC-60-92
S63DC-86-111.....	S63DC-97-111
S63DC-86-123.....	S63DC-97-123
S63DC-87-120.....	S63DC-102-120
S63DC-87-126.....	S63DC-102-126
S63DC-87-138.....	S63DC-102-138
S63DC-87-150.....	S63DC-102-150
S63DC-87-162.....	S63DC-102-162
S63DC-92-67.....	S63DC-79-67
S63MB-11-108.....	S63MB-11-108
S63MB-1-120.....	S63MB-9-120
S63MB-1-140.....	S63MB-8-140
S63MB-2-120.....	S63MB-9-120
S63MB-5-108.....	S63MB-11-108
S63MB-8-120.....	S63MB-9-120
S63MB-8G-140.....	S63MB-8-140
S63MB-9G-120.....	S63MB-9-120
S64DB-1-135.....	S64DB-12-135
S64DB-1-156.....	S64DB-12-156
S64DB-2-135.....	S64DB-12-135
S64DB-2-156.....	S64DB-12-156
S64DB-3-135.....	S64DB-12-135
S64DB-3-156.....	S64DB-12-156
S64DB-4-135.....	S64DB-12-135
S64DB-4-156.....	S64DB-12-156
S64DB-5-135.....	S64DB-12-135
S64DB-5-156.....	S64DB-12-156
S64DB-6-135.....	S64DB-12-135
S64DB-6-156.....	S64DB-12-156
S64DB-6G-135.....	S64DB-12-135
S64DB-6G-156.....	S64DB-12-156
S64DB-6G-156R.....	S64DB-12-156
S64DC-1-157.....	S64DC-15-157
S64DC-13-157.....	S64DC-15-157

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Crossover and Application Data is for Reference Purpose Only. No Other Conditions are Expressed or Implied.

Note: It is the Users Responsibility to Verify if the Replacement Cylinder is Interchangeable.

Note: In some applications, modifications may be required for proper cylinder installation.



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S84CC-6-134.....	S84DC-66-140
S84CC-6-149.....	S84DC-66-148
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Note: It is the Users Responsibility to Verify if the Replacement Cylinder is Interchangeable.

Note: In some applications, modifications may be required for proper cylinder installation.



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S85MC-3-220	S85MC-48-220
S85MC-3-235	S85MC-48-235
S85MC-3-250	S85MC-48-250
S85MC-35-220	S85MC-48-220
S85MC-45-200-15.5	S85MC-48-200
S85MC-45-220-15.5	S85MC-48-220
S85MC-45-235-15.5	S85MC-48-235
S85MC-45-250-15.5	S85MC-48-250
S85MC-46-200-15.5	S85MC-48-200
S85MC-46-220-15.5	S85MC-48-220
S85MC-46-235-15.5	S85MC-48-235
S85MC-46-250-15.5	S85MC-48-250
S85MC-46-265-15.5	S85MC-48-265
S85MC-46-280-15.5	S85MC-48-280
S95CC-22-190	S95DC-52-190 CM4
S95CC-22-220	S95DC-52-220 CM4
S95CC-22-235	S95DC-52-235 CM4
S95CC-22-250	S95DC-52-250 CM4
S95DC-22-190	S95DC-52-190 CM4
S95DC-22-235	S95DC-52-235 CM4
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S95DC-25-235	S95DC-52-235 CM4
S95DC-25-250	S95DC-52-250 CM4
S95DC-30-220	S95DC-52-220 CM4
S95DC-30-235	S95DC-52-235 CM4
S95DC-30-250	S95DC-52-250 CM4
S95DC-30-300	S95DC-52-300
S95DC-31-260	S95DC-52-265
S95DC-40-190	S95DC-52-190
S95DC-40-210	S95DC-52-220
S95DC-40-220	S95DC-52-220
S95DC-40-235	S95DC-52-235
S95DC-40-250	S95DC-52-250
S95DC-40-265	S95DC-52-265
S95DC-40-280	S95DC-52-280
S95DC-40-285	S95DC-52-285
S95DC-40-300	S95DC-52-300
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S95DC-40G-250	S95DC-52-250
S95DC-40G-265	S95DC-52-265
S95DC-40G-280	S95DC-52-280
S95DC-41-260	S95DC-52-265
S95DC-43-190	S95DC-52-190
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SA53DB-3-120	S53DC-65-120 CM25
SA73DC-2-139	S73DC-66-140
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SA83DC-1-139	S83DC-56-139
SA85DC-1-197	S85DC-66-197
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SD42CC-13-111	SD42CC-19-111
SD42CC-19G-111	SD42CC-19-111
SD42CC-8-111	SD42CC-19-111
SD52CC-19-111	SD52CC-24-111
SD52CC-24G-111	SD52CC-24-111
SD53CC-26-155	SD53CC-36-155
SD53CC-26G-155	SD53CC-36-155
SD53CC-28-182	SD53CC-51-182
SD53CC-31-151	SD53CC-51-151.5
SD53CC-31-182	SD53CC-51-182
SD53CC-31G-182	SD53CC-51-182
SD53CC-32-151.5	SD53CC-51-151.5
SD53CC-32-182	SD53CC-51-182
SD53CC-38-151.5	SD53CC-51-151.5
SD53CC-38-182	SD53CC-51-182
SD53CC-38-182R	SD53CC-51-182
SD53CC-41-151.5	SD53CC-51-151.5
SD53CC-41-182	SD53CC-51-182
SD53CC-41A-151.5	SD53CC-51-151.5

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SD53CC-45-164	SD53CC-48-164
SD53CC-CP236-155	SD53CC-36-155
SD53CD-CP510-168	SD53CD-3-168
SD62CB-10-114	SD62CB-12-114
SD62CB-11-114	SD62CB-12-114
SD62DB-1-79	SD62DB-6-79
SD63CB-11-118	SD63CB-23-118
SD63CB-12-132	SD63CB-26-132.75
SD63CB-12-167	SD63CB-26-167
SD63CB-12-167R	SD63CB-26-167
SD63CB-12-197	SD63CB-26-197
SD63CB-13-167	SD63CB-27-167
SD63CB-14-118	SD63CB-23-118
SD63CB-14-118R	SD63CB-23-118
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SD63CB-15-167	SD63CB-26-167
SD63CB-15-197	SD63CB-26-197
SD63CB-15G-132	SD63CB-26-132.75
SD63CB-15G-167	SD63CB-26-167
SD63CB-16-167	SD63CB-27-167
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SD63CB-23-118	SD63CB-23-118
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SD63CB-5-132	SD63CB-26-132.75
SD63CB-5-167	SD63CB-26-167
SD63CB-6-118	SD63CB-23-118
SD63CB-7-132	SD63CB-26-132.75
SD63CB-7-167	SD63CB-26-167
SD63CB-8-132	SD63CB-26-132.75
SD63CB-8-167	SD63CB-26-167
SD63CB-8-197.44	SD63CB-26-197
SD63CC-20-167	SD63CC-23-167
SD63CC-29-167	SD63CC-39-167
SD63CC-40-164	SD63CC-44-164
SD63CC-40-181	SD63CC-44-181
SD63CC-41-164	SD63CC-44-164
SD63CC-41-181	SD63CC-44-181
SD63CC-48-166.94	SD63CC-39-167
SD63CC-CP640-164	SD63CC-44-164
SD63CC-CP645-181	SD63CC-44-181
SD63DB-13-120	SD63DB-14-120
SD63DB-14G-120	SD63DB-14-120
SD63DB-4-120	SD63DB-14-120
SD63DB-5-120	SD63DB-14-120
SD63DB-9-120	SD63DB-14-120
SD63DD-1-164	SD53CC-48-164
SD63DD-2-164	SD53CC-48-164
SD63DD-2G-164	SD53CC-48-164
SD64CC-11-118	SD64CC-7-118
SD64CC-11-132	SD64CC-7-132
SD64CC-11-152	SD64CC-7-152
SD64CC-6-132	SD64CC-7-132
SD64CC-6-152	SD64CC-7-152
SD64CC-7G-118	SD64CC-7-118
SD64CC-7G-132	SD64CC-7-132
SD64CC-7G-152	SD64CC-7-152
SD64DC-3-145	SD64DC-5-145
SD73CC-25G-120	SD73CC-25-120
SD73CC-9-120	SD73CC-25-120
SD73DB-6-115	SD73DB-10-115
SD73DB-6G-115	SD73DB-10-115
SD74DC-11-119	SD74DC-7-119
SD74DC-CP135-119	SD74DC-7-119
SD83CB-13-117	SD83CB-16-117
SD83CB-15-117	SD83CB-16-117
SD83CB-5-117	SD83CB-16-117
SD83CB-6-117	SD83CB-16-117
SD83CB-7-117	SD83CB-16-117
SD83CC-5-132	SD83CC-24-132
SD83CC-5-156	SD83CC-24-156
SD83LF-3-177	SD83LF-5-177
SD83LF-4-177	SD83LF-5-177
SD84CC-17-178	SD84CC-20-178
SD84CC-5-178	SD84CC-20-178
SD84MC-14-152	SD84MC-18-152

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SD84MC-3-152	SD84MC-18-152
SD84MC-3-176	SD84MC-18-176
SD84MC-4-152	SD84MC-18-152
SD84MC-4-176	SD84MC-18-176
SD84MC-8-152	SD84MC-18-152
SD84MC-8-176	SD84MC-18-176
SD84MC-9-152	SD84MC-18-152
SD84MC-9-176	SD84MC-18-176
SD85CC-17-378	SD85CC-19-378
SD85MC-11-220	SD85MC-16-220
SD85MC-15G-220	SD85MC-15-220
SD85MC-16G-220	SD85MC-16-220
SD85MC-3-221	SD85MC-15-220
SD85MC-4-221	SD85MC-15-220
SD85MC-8-220	SD85MC-15-220
SD85MC-9-220	SD85MC-15-220
SD93CC-13-132	SD93CC-13-132
SD93DC-1-177	SD93DC-5-177.12
SD95CC-1-160	SD95CC-3-160
SD95MC-2-220	SD95MC-6-220
SD96CC-1-199	SD96CC-3-199
SD96CC-3G-199	SD96CC-3-199
SD96MC-5G-480	SD96MC-5-480
SD96MC-6-480	SD96MC-5-480

Crysteel

107439	S74DC-74-161
107450	S73DC-66-129
107455	S73DC-66-150
107548	S73DC-66-150
403013	S74DC-74-161
403108	S73DC-66-129
403109	S73DC-66-150
403110	S74DC-74-161
T73129	S73DC-66-129
T73147	S73DC-66-150
T74167	S74DC-74-161

Custom Hoist

32-29-43	S32DB-3-42.62 CM72
42-1-90	S42MB-3-90
42-21-53	S42DB-8-51 CM72
42-38-60	M42MB-60
42-44-60	S42MB-5-60
42-60-43	M42DB-43-P
42-75-43	S42DB-8-43 CM72
42-75-50	S42DB-8-51 CM72
42-76-43	M42DB-43-P
42-790-56	S52CC-41-54.62
42-793-68	S52CC-41-67.25
43-5-72	S43DB-3-75 CM72
43-5-75	S43DB-3-75 CM72
501-25470-03	S84DC-66-170
53-110-81	S53DC-60-81
53-12-122	S53DC-68-123
53-12-99	S53DC-68-99
53-131-110	S53DC-65-107
53-131-130	S53DC-65-126
53-139-104	S53DC-65-104
53-139-130	S53DC-65-130 CM4
53-139-72	S53DC-66-72
53-139-84	S53DC-66-84
53-147-105	S53DC-65-104 CM4
53-147-130	S53DC-65-130 CM4
53-149-99	S53DC-68-99
53-2-104	S53DC-65-104 CM4
53-2-105	S53DC-65-104 CM4
53-2-126	S53DC-65-126 CM4
53-2-130	S53DC-65-130 CM4
53-2-60S	S53DC-66-72 CM4
53-2-72	S53DC-66-72 CM4
53-2-72S	S53DC-66-72 CM4
53-2-74	S53DC-66-72 CM4
53-2-84	S53DC-66-84 CM4
53-2-88	S53DC-66-84 CM4
53-2-90	S53DC-66-84 CM4
53-3-120	S53MB-3-120
53-403-120	S53MB-3-120

Crossover and Application Data is for Reference Purpose Only. No Other Conditions are Expressed or Implied.

Note: It is the Users Responsibility to Verify if the Replacement Cylinder is Interchangeable.

Note: In some applications, modifications may be required for proper cylinder installation.



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53-459-105	S53DC-68-105
53-459-122	S53DC-68-123
53-459-128	S53DC-68-123
53-5-110	S53DC-65-107
53-52-120	S53DC-68-120
53-52-130	S53DC-65-130 CM2
53-531-110	S53DC-65-107
53-531-130	S53DC-65-126
53-539-84	S53DC-66-84
53-59-105	S53DC-68-105
53-59-122	S53DC-68-123
53-59-128	S53DC-68-123
53-59-99	S53DC-68-99
53-703-120	S53MB-3-120
53-72-104	S53DC-65-104 CM4
53-72-105	S53DC-65-104 CM4
53-72-130	S53DC-65-130 CM4
53-73-89	S53MB-5-90
53-759-105	S53DC-68-105
53-759-122	S53DC-68-123
53-759-128	S53DC-68-123
53-80-120	S53DC-68-120
53-810-81	S53DC-60-81
53-831-110	S53DC-65-107
53-831-130	S53DC-65-126
53-839-104	S53DC-65-104
53-839-72	S53DC-66-72
53-839-84	S53DC-66-84
53-892-106	S53DC-65-104
53-892-72	S53DC-66-72
53-892-84	S53DC-66-84
63-10-120	S63DC-102-120
63-10-127	S63DC-102-126
63-105-110	S63DC-101-107 CM17
63-105-126	S63DC-97-123 CM63
63-105-142	S63DC-101-140 CM17
63-105-144	S63DC-101-140 CM17
63-105-97	S63DC-101-92 CM17
63-1-104	S63DC-101-104 CM43
63-1-105	S63DC-101-104 CM43
63-1-120	S63DC-101-120 CM45
63-1-130	S63DC-96-130 CM43
63-1-137	S63DC-96-130 CM43
63-1-138	S63DC-96-130 CM43
63-129-107	S63DC-60-106
63-129-126	S63DC-60-125
63-129-80	S63DC-60-79.12
63-129-92	S63DC-60-92
63-153-130	S63DC-102-126
63-153-140	S63DC-102-138
63-157-80	S63DC-101-77 CM22
63-171-121	S63DC-102-120
63-171-125	S63DC-102-126
63-171-139	S63DC-102-138
63-172-108	S63DC-60-106
63-172-126	S63DC-60-125
63-179-104	S63DC-101-104 CM43
63-179-88	S63DC-101-86 CM43
63-1-80	S63DC-101-77 CM43
63-180-104	S63DC-101-104
63-180-108	S63DC-101-107
63-180-111S	S63DC-97-111
63-180-126	S63DC-97-123
63-180-130	S63DC-96-130
63-180-137	S63DC-96-130
63-180-88	S63DC-101-86 CM2
63-182-104	S63MB-11-108
63-182-126	S63MB-9-120
63-182-140	S63MB-8-140
63-182-150	S63MB-8-150
63-182-160	S63MB-8-160
63-183-107	S63DC-101-107 CM38
63-183-125	S63DC-101-126 CM38
63-1-84	S63DC-101-86 CM43
63-184-111	S63DC-97-111 CM11
63-184-123	S63DC-97-123 CM11
63-184-140	S63DC-101-140 CM11
63-185-98	S63DC-101-104 CM36

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63-186-121	S63DC-102-120
63-186-125	S63DC-102-126
63-186-139	S63DC-102-138
63-186-160	S63DC-102-162
63-1-88	S63DC-101-86 CM43
63-189-126	S63DC-97-123
63-189-130	S63DC-96-130 CM2
63-189-140	S63DC-101-140 CM2
63-191-130	S63DC-96-130 CM2
63-202-121	S63DC-102-120
63-202-125	S63DC-102-126
63-202-139	S63DC-102-138
63-2-100S	S63DC-101-107 CM2
63-2-102	S63DC-101-104 CM2
63-2-104	S63DC-101-104
63-2-105	S63DC-101-104 CM2
63-2-106	S63DC-101-107 CM2
63-2-108	S63DC-101-107
63-21-108	S63DC-101-107 CM36
63-2-111S	S63DC-97-111
63-21-120	S63DC-101-120 CM36
63-2-120	S63DC-101-120
63-2-126	S63DC-97-123
63-2-130	S63DC-96-130 CM2
63-2-132	S63DC-96-130
63-2-137	S63DC-96-130 CM2
63-2-140	S63DC-101-140
63-2-150	S63DC-101-150
63-2-156	S63DC-101-150
63-22-108	S63DC-101-107 CM36
63-22-120	S63DC-101-120 CM36
63-23-98	S63DC-101-104 CM36
63-27-121	S63DC-102-120
63-27-125	S63DC-102-126
63-27-139	S63DC-102-138
63-27-160	S63DC-102-162
63-2-72S	S63DC-101-77 CM2
63-2-74S	S63DC-101-77 CM2
63-2-84	S63DC-101-86
63-2-84S	S63DC-101-86
63-2-87	S63DC-101-86 CM2
63-2-88	S63DC-101-86 CM2
63-2-90	S63DC-101-86 CM2
63-2-92S	S63DC-101-92
63-2-93	S63DC-101-92
63-2-99S	S63DC-101-104 CM2
63-402-104	S63DC-101-104
63-402-108	S63DC-101-107
63-402-120	S63DC-101-120
63-402-126	S63DC-101-126
63-402-132	S63DC-96-130 CM2
63-402-140	S63DC-101-140
63-402-84	S63DC-101-86
63-4-104	S63MB-11-108
63-4-120	S63MB-9-120
63-4-126	S63MB-9-120
63-4-140	S63MB-8-140
63-4-150	S63MB-8-150
63-4-160	S63MB-8-160
63-44-108	S63DC-101-107 CM2
63-44-120	S63DC-101-120 CM2
63-44-126	S63DC-97-123
63-44-130	S63DC-96-130 CM2
63-44-140	S63DC-101-140 CM2
63-4-96	S63MB-11-108
63-5-107	S63DC-101-107 CM38
63-5-125	S63DC-101-126 CM38
63-53-130	S63DC-96-130 CM2
63-54-120	S63DC-101-120 CM2
63-54-78S	S63DC-101-77 CM2
63-553-130	S63DC-102-126
63-553-140	S63DC-102-138
63-579-104	S63DC-101-104 CM43
63-580-126	S63DC-97-123
63-582-140	S63MB-8-140
63-586-125	S63DC-102-126
63-586-139	S63DC-102-138
63-702-104	S63DC-101-104

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63-702-108	S63DC-101-107
63-702-120	S63DC-101-120
63-702-126	S63DC-101-126
63-702-132	S63DC-96-130
63-702-140	S63DC-101-140
63-702-84	S63DC-101-86
63-8-104	S63DC-101-104 CM11
63-8-111	S63DC-97-111 CM11
63-8-123	S63DC-97-123 CM11
63-8-130	S63DC-101-126 CM11
63-8-140	S63DC-101-140 CM11
63-83-108	S63DC-60-106
63-83-126	S63DC-60-125
63-8-80	S63DC-101-77 CM11
63-8-82	S63DC-96-82.50 CM11
63-882-140	S63MB-8-140
63-8-86	S63DC-101-86 CM11
63-886-121	S63DC-102-120
63-886-125	S63DC-102-126
63-886-139	S63DC-102-138
63-886-150	S63DC-102-150
64-35-135	S64DB-12-135
64-35-156	S64DB-12-156
64-40-156	S64DC-14-156
64-435-135	S64DB-12-135
64-435-156	S64DB-12-156
64-440-156	S64DC-14-156
64-467-156	S64DC-14-156
64-5-156	S64DC-14-156
64-735-135	S64DB-12-135
64-735-156	S64DB-12-156
64-767-156	S64DC-14-156
64-8-156	S64DC-14-156
73-100-110	S73DC-66-110
73-101-130	S73DC-66-129
73-102-150	S73DC-66-150
73-104-124	S73DC-66-124
73-104-130	S73DC-66-129
73-105-140	S74DC-74-140
73-108-130	S73DC-66-129
73-109-120	S73DC-66-120
73-1-110	S73DC-66-110 CM23
73-1-127	S73DC-66-124 CM23
73-1-142	S73DC-66-140 CM23
73-116-140	S73DC-66-140
73-122-150	S73DC-66-150
73-15-115	S73DC-66-110
73-15-130	S73DC-66-129
73-15-135	S73DC-66-129
73-157-141	S73DC-60-142
73-21-120	S73DC-66-120 CM4
73-2-120	S73DC-66-120
73-2-150	S73DC-66-150
73-22-120	S73DC-66-120 CM4
73-25-110	S73DC-66-110 CM4
73-25-120	S73DC-66-120 CM4
73-25-126	S73DC-66-124 CM4
73-26-120	S73DC-66-120
73-26-140	S73DC-66-140
73-26-150	S73DC-66-150
73-28-120	S73DC-66-120
73-28-130	S73DC-66-129
73-28-132	S73DC-66-129
73-28-140	S73DC-66-140
73-28-150	S73DC-66-150
73-29-108S	S73DC-66-110
73-29-110S	S73DC-66-110
73-29-120	S73DC-66-120
73-29-120S	S73DC-66-124
73-29-124	S73DC-66-124
73-29-124S	S73DC-66-129 CM2
73-29-130	S73DC-66-129
73-29-142	S73DC-66-140
73-3-110	S73DC-66-110
73-3-115	S73DC-66-110
73-3-120	S73DC-66-120
73-3-130	S73DC-66-129
73-3-140	S73DC-66-140

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Note: It is the Users Responsibility to Verify if the Replacement Cylinder is Interchangeable.

Note: In some applications, modifications may be required for proper cylinder installation.



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73-3-150	S73DC-66-150
73-35-110	S73DC-66-110
73-429-120	S73DC-66-120
73-457-125	S73DC-60-125
73-457-141	S73DC-60-142
73-457-145	S73DC-60-142
73-500-110	S73DC-66-110
73-500-118	S73DC-66-120
73-500-127	S73DC-66-124
73-500-142	S73DC-66-140
73-500-151	S73DC-66-150
73-50-130	S73DC-66-129
73-504-130	S73DC-66-129
73-55-110	S73DC-66-110
73-55-120	S73DC-66-120
73-55-126	S73DC-66-124
73-57-125	S73DC-60-125
73-57-141	S73DC-60-142
73-57-145	S73DC-60-142
73-757-141	S73DC-60-142
73-78-125	S73DC-60-125
73-78-142	S73DC-60-142
73-800-110	S73DC-66-110
73-800-118	S73DC-66-120
73-800-127	S73DC-66-124
73-800-142	S73DC-66-140
73-800-151	S73DC-66-150
73-81-114	S73DC-66-110 CM26
73-81-129	S73DC-66-124 CM26
73-9-110	S73DC-66-110 CM11
73-9-125	S73DC-66-124 CM11
73-9-129	S73DC-66-124 CM11
73-9-130	S73DC-66-129 CM11
73-94-140	S73DC-66-140
74-100-135	S74DC-74-135 CM11
74-100-142	S74DC-74-140 CM11
74-101-161	S74DC-74-161
74-101-167	S74DC-74-167
74-10-123	S74DC-74-120 CM11
74-10-135	S74DC-74-135 CM11
74-10-142	S74DC-74-140 CM11
74-10-156	S74DC-74-156 CM11
74-102-120	S74DC-74-120
74-102-137	S74DC-74-135
74-103-120	S74DC-74-120 CM4
74-103-137	S74DC-74-135 CM2
74-103-167	S74DC-74-161 CM4
74-104-167	S74MB-5-167
74-107-150	S74MB-3-154
74-107-172	S74MB-3-172
74-1-118	S74DC-74-120
74-1-120	S74DC-74-120
74-1-124S	S74DC-74-135
74-1-126	S74DC-74-120
74-1-135	S74DC-74-135
74-1-137	S74DC-74-135
74-1-138	S74DC-74-135
74-1-140	S74DC-74-140
74-1-140S	S74DC-74-140
74-1-144	S74DC-74-140
74-1-146	S74DC-74-140
74-1-156	S74DC-74-156
74-1-160	S74DC-74-156
74-1-161	S74DC-74-161
74-1-163	S74DC-74-161
74-1-167	S74DC-74-161
74-1-174	S84DC-66-170
74-1-176	S84DC-66-170
74-1-180	S74DC-74-180
74-12-120	S74DC-74-120
74-12-137	S74DC-74-140
74-12-144	S74DC-74-140
74-12-156	S74DC-74-156
74-12-161	S74DC-74-161
74-12-167	S74DC-74-161
74-15-135	S74DC-74-135
74-15-140	S74DC-74-140
74-15-156	S74DC-74-156

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74-15-161	S74DC-74-161
74-16-135	S74DC-74-135 CM4
74-21-140	S74DC-74-140 CM2
74-21-156	S74DC-74-156 CM4
74-22-140	S74DC-74-135 CM4
74-22-156	S74DC-74-156 CM4
74-27-135	S74DC-74-135 CM4
74-27-156	S74DC-74-156 CM4
74-28-120	S74DC-74-120
74-28-137	S74DC-74-135
74-28-161	S74DC-74-161
74-28-174	S84DC-66-170
74-31-135	S74DC-74-135 CM4
74-31-167	S74DC-74-161 CM4
74-3-135	S74DC-74-135 CM9
74-3-156	S74DC-74-156 CM9
74-3-182	S74DC-74-180
74-34-120	S74DC-74-120 CM4
74-34-137	S74DC-74-135 CM2
74-34-144	S74DC-74-140 CM4
74-34-156	S74DC-74-156 CM4
74-34-167	S74DC-74-161 CM4
74-36-167	S74MB-5-167
74-37-135	S74DC-74-135
74-37-140	S74DC-74-140
74-37-160	S74DC-74-156
74-401-120	S74DC-74-120
74-401-135	S74DC-74-135
74-401-140	S74DC-74-140
74-401-156	S74DC-74-156
74-401-161	S74DC-74-161
74-401-167	S74DC-74-167
74-401-180	S74DC-74-180
74-46-150	S74MB-3-154
74-46-154	S74MB-3-154
74-46-170	S74MB-3-172
74-498-120	S74DC-74-120
74-498-140	S74DC-74-140
74-498-167	S74DC-74-167
74-499-135	S74DC-77-135
74-504-167	S74MB-5-167
74-535-154	S74MB-3-154
74-63-165	S74DC-60-165.75
74-65-154	S74MB-3-154
74-65-170	S74MB-3-172
74-701-120	S74DC-74-120
74-701-135	S74DC-74-135
74-701-140	S74DC-74-140
74-701-156	S74DC-74-156
74-701-161	S74DC-74-161
74-701-167	S74DC-74-167
74-701-180	S74DC-74-180
74-71-154	S74MB-3-154
74-7-120	S74DC-74-120 CM38
74-7-135	S74DC-77-135
74-7-144	S74DC-74-140 CM38
74-7-164	S74DC-74-161 CM38
74-7-166	S74DC-74-161 CM38
74-80-166	S74DC-60-165.75
74-804-167	S74MB-5-167
74-98-120	S74DC-74-120
74-98-140	S74DC-74-140
74-98-167	S74DC-74-161
74-99-135	S74DC-77-135
74-99-166	S74DC-74-161 CM38
8 1/4 4-10-150	S84DC-66-148 CM2
8 1/4 4-10-190	S84DC-66-188 CM2
8 1/4 4-11-150	S84DC-66-148 CM2
8 1/4 4-20-150	S84DC-66-148 CM2
8 1/4 4-4-150	S84DC-66-148 CM2
8 1/4 4-4-190	S84DC-66-188 CM2
8 1/4 5-20-190	S85DC-66-190
8 1/4 5-20-220	S85DC-66-220
8 1/4 5-20-235	S85DC-66-235
8 1/4 5-20-250	S85DC-66-250
8 1/4 5-20-265	S85DC-66-265
8 1/4 5-21-265	S85DC-66-265
8 1/4 5-26-265	S85DC-66-265

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8 1/4 5-26-270	S85DC-66-265
8 1/4 5-26-285	S85DC-66-285
8 1/4 5-404-220	S85DC-66-220
8 1/4 5-404-235	S85DC-66-235
8 1/4 5-404-250	S85DC-66-250
8 1/4 5-4-190	S85DC-66-190
8 1/4 5-4-220	S85DC-66-220
8 1/4 5-4-235	S85DC-66-235
8 1/4 5-4-250	S85DC-66-250 CM2
8 1/4 5-4-265	S85DC-66-265
8 1/4 5-4-270	S85DC-66-265
8 1/4 5-4-285	S85DC-66-285
83-4-135	S83DC-56-134
83-4-140	S83DC-56-139
83-4-170	S84DC-66-180
84-1-156	S84DC-66-156 CM11
84-13-135S	S84DC-66-140
84-13-140	S84DC-66-140
84-13-148	S84DC-66-148
84-13-150	S84DC-66-148
84-13-150S	S84DC-66-156
84-13-156	S84DC-66-156
84-13-156S	S84DC-66-161
84-13-160	S84DC-66-156
84-13-161	S84DC-66-161
84-13-166	S84DC-66-161
84-13-170	S84DC-66-170
84-13-180	S84DC-66-180
84-13-183	S84DC-66-180
84-13-190	S84DC-66-188
84-14-188	S84DC-66-188 CM9
84-17-150	S84DC-66-148 CM49
84-17-170	S84DC-66-170 CM49
84-17-180	S84DC-66-180 CM49
84-20-140	S84DC-66-140
84-20-150	S84DC-66-148
84-20-175	S84DC-66-170
84-21-140	S84DC-66-140
84-21-156	S84DC-66-156
84-2-140	S84DC-66-140
84-2-150	S84DC-66-148
84-2-156	S84DC-66-156
84-2-160	S84DC-66-156
84-2-165	S84DC-66-161
84-2-170	S84DC-66-170
84-2-174	S84DC-66-170
84-2-181	S84DC-66-180
84-2-188	S84DC-66-188
84-2-190	S84DC-66-188
84-22-140	S84DC-66-140
84-22-156	S84DC-66-156
84-23-156	S84DC-66-156
84-23-170	S84DC-66-170
84-23-190	S84DC-66-188
84-24-140	S84DC-66-140
84-4-140	S84DC-66-140
84-4-166	S84DC-66-161
84-4-180	S84DC-66-180
84-466-148	S84DC-66-148
84-466-156	S84DC-66-156
84-466-160	S84DC-66-156
84-466-161	S84DC-66-161
84-466-166	S84DC-66-161
84-466-170	S84DC-66-170
84-466-180	S84DC-66-180
84-466-183	S84DC-66-180
84-51-188	S84DC-66-188 CM9
84-65-165	S84DC-66-161
84-66-148	S84DC-66-148
84-66-156	S84DC-66-156
84-66-160	S84DC-66-156
84-66-161	S84DC-66-161
84-66-166	S84DC-66-161
84-66-170	S84DC-66-170
84-66-180	S84DC-66-180
84-66-183	S84DC-66-180
84-68-150	S84DC-66-148 CM49
84-69-156	S84DC-66-156

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Note: In some applications, modifications may be required for proper cylinder installation.



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Custom Hoist

84-7-180	S84DC-66-180	CM21
84-72-188	S84DC-66-188	CM9
85-11-162	S85DC-66-160	
85-11-170	S85DC-66-170	
85-11-190	S85DC-66-190	
85-11-200	S85DC-66-197	
85-11-220	S85DC-66-220	
85-11-235	S85DC-66-235	
85-11-250	S85DC-66-250	
85-11-265	S85DC-66-265	
85-11-285	S85DC-66-285	
85-14-190	S85MC-48-200	
85-14-200	S85MC-48-200	
85-14-220	S85MC-48-220	
85-14-235	S85MC-48-235	
85-14-240	S85MC-48-235	
85-14-250	S85MC-48-250	
85-14-265	S85MC-48-265	
85-14-280	S85MC-48-280	
85-16-162	S85DC-66-160	
85-16-220	S85DC-66-220	
85-16-235	S85DC-66-235	
85-16-250	S85DC-66-250	
85-20-170	S85DC-66-170	
85-20-190	S85DC-66-190	
85-20-220	S85DC-66-220	
85-20-235	S85DC-66-235	
85-20-250	S85DC-66-250	
85-20-265	S85DC-66-265	
85-20-285	S85DC-66-285	
85-2-160	S85DC-66-160	
85-2-166	S85DC-66-160	
85-2-170	S85DC-66-170	
85-2-190	S85DC-66-190	
85-2-195	S85DC-66-197	
85-2-200	S85DC-66-197	
85-2-200S	S85DC-66-197	
85-2-220	S85DC-66-220	
85-2-225	S85DC-66-220	
85-2-235	S85DC-66-235	
85-2-250	S85DC-66-250	
85-2-260	S85DC-66-265	
85-2-265	S85DC-66-265	
85-2-270	S85DC-66-265	
85-2-285	S85DC-66-285	
85-28-170	S85DC-66-170	
85-28-190	S85DC-66-190	
85-28-220	S85DC-66-220	
85-28-235	S85DC-66-235	
85-28-250	S85DC-66-250	
85-28-265	S85DC-66-265	
85-28-289	S85DC-66-285	
85-3-203	S85DC-66-197	CM46
85-3-235	S85DC-66-235	CM46
85-3-260	S85DC-66-265	CM46
85-3-265	S85DC-66-265	CM46
85-34-162	S85DC-66-160	
85-34-170	S85DC-66-170	
85-34-190	S85DC-66-190	
85-34-200	S85DC-66-197	
85-34-220	S85DC-66-220	
85-34-235	S85DC-66-235	
85-34-250	S85DC-66-250	
85-34-265	S85DC-66-265	
85-35-220	S85DC-66-220	CM54
85-35-235	S85DC-66-235	CM54
85-402-170	S85DC-66-170	
85-402-190	S85DC-66-190	
85-402-197	S85DC-66-197	
85-402-200	S85DC-66-197	
85-402-220	S85DC-66-220	
85-402-235	S85DC-66-235	
85-402-250	S85DC-66-250	
85-4-190	S85DC-66-190	CM49
85-4-220	S85DC-66-220	CM49
85-4-260	S85DC-66-265	CM49
85-4-265	S85DC-66-265	CM49
85-453-265	S85DC-66-265	

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85-463-200T	S85MC-48-200	
85-463-220T	S85MC-48-220	
85-463-235T	S85MC-48-235	
85-463-250T	S85MC-48-250	
85-463-265T	S85MC-48-265	
85-463-280T	S85MC-48-280	
85-463-285T	S85MC-48-280	
85-466-265	S85DC-66-265	
85-466-285	S85DC-66-285	
85-499-200	S85MC-48-200	
85-499-220	S85MC-48-220	
85-499-235	S85MC-48-235	
85-499-250	S85MC-48-250	
85-499-265	S85MC-48-265	
85-499-280	S85MC-48-280	
85-5-190	S85DC-66-190	
85-5-220	S85DC-66-220	
85-5-265	S85DC-66-265	
85-5-285	S85DC-66-285	
85-53-265	S85DC-66-265	
85-54-190	S85MC-48-200	
85-54-200	S85MC-48-200	
85-54-220	S85MC-48-220	
85-54-240	S85MC-48-235	
85-54-250	S85MC-48-250	
85-6-162	S85DC-66-160	
85-6-190	S85DC-66-190	
85-6-220	S85DC-66-220	
85-6-235	S85DC-66-235	
85-6-250	S85DC-66-250	
85-6-265	S85DC-66-265	
85-63-190T	S85MC-48-200	
85-63-200T	S85MC-48-200	
85-63-220T	S85MC-48-220	
85-63-235T	S85MC-48-235	
85-63-240T	S85MC-48-235	
85-63-250T	S85MC-48-250	
85-63-265T	S85MC-48-265	
85-63-280T	S85MC-48-280	
85-63-285T	S85MC-48-280	
85-66-195	S85DC-66-197	
85-66-265	S85DC-66-265	
85-66-270	S85DC-66-265	
85-66-285	S85DC-66-285	
85-67-203	S85DC-66-197	CM46
85-67-265	S85DC-66-265	CM46
85-68-260	S85DC-66-265	CM49
85-68-265	S85DC-66-265	CM49
85-69-265	S85DC-66-265	
85-70-265	S85DC-66-265	
85-70-285	S85DC-66-285	
85-73-285	S85DC-66-285	
85-75-265	S85DC-66-265	
85-77-265	S85DC-66-265	
85-81-200T	S85MC-48-200	CM1
85-81-220T	S85MC-48-220	CM1
85-81-235T	S85MC-48-235	CM1
85-81-250T	S85MC-48-250	CM1
85-81-265T	S85MC-48-265	
85-9-162	S85DC-66-160	
85-9-166	S85DC-66-160	
9 3/4 5-11-190	S95DC-52-190	CM4
9 3/4 5-11-235	S95DC-52-235	CM4
9 3/4 5-11-250	S95DC-52-250	CM4
9 3/4 5-11-265	S95DC-52-265	CM4
9 3/4 5-11-300	S95DC-52-300	
9 3/4 5-411-190	S95DC-52-190	CM4
9 3/4 5-411-235	S95DC-52-235	CM4
9 3/4 5-411-250	S95DC-52-250	CM4
9 3/4 5-411-265	S95DC-52-265	CM4
9 3/4 5-411-300	S95DC-52-300	
9 3/4 5-4-190	S95DC-52-190	
9 3/4 5-4-235	S95DC-52-235	
9 3/4 5-4-250	S95DC-52-250	
9 3/4 5-4-260	S95DC-52-265	
9 3/4 5-4-265	S95DC-52-265	
9 3/4 5-4-280	S95DC-52-280	
9 3/4 5-4-300	S95DC-52-300	

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93-10-110	S93CC-CP112-110	
95-11-190	S95DC-52-190	
95-11-190S	S95DC-52-190	
95-11-200	S95DC-52-190	
95-11-235	S95DC-52-235	
95-11-250	S95DC-52-250	
95-11-260	S95DC-52-265	
95-11-260S	S95DC-52-265	
95-11-264S	S95DC-52-265	
95-11-265	S95DC-52-265	
95-11-265S	S95DC-52-265	
95-11-270	S95DC-52-265	
95-11-280	S95DC-52-280	
95-11-285	S95DC-52-280	
95-11-300	S95DC-52-300	
95-11-320	S95DC-52-320	
95-13-265	S95DC-52-265	
95-20-235	S95DC-52-235	
95-20-250	S95DC-52-250	CM42
95-22-190	S95DC-52-190	
95-22-220	S95DC-52-220	
95-22-235	S95DC-52-235	
95-22-250	S95DC-52-250	
95-22-285	S95DC-52-280	
95-2-235	S95DC-52-235	
95-2-250	S95DC-52-250	
95-2-260	S95DC-52-265	
95-2-300	S95DC-52-300	
95-2-320	S95DC-52-320	
95-3-235	S95DC-52-235	CM9
95-3-250	S95DC-52-250	CM9
95-3-260	S95DC-52-265	CM9
95-38-250	S95DC-52-250	
95-38-265	S95DC-52-265	
95-411-235	S95DC-52-235	
95-4-190	S95DC-52-190	
95-4-235	S95DC-52-235	
95-4-236	S95DC-52-235	
95-4-250	S95DC-52-250	
95-4-250S	S95DC-52-250	
95-4-285	S95DC-52-280	
95-461-250	S95DC-52-250	
95-461-265	S95DC-52-265	
95-461-280	S95DC-52-280	
95-461-300	S95DC-52-300	
95-461-320	S95DC-52-320	
95-53-235	S95DC-52-235	
95-53-250	S95DC-52-250	
95-53-260	S95DC-52-265	
95-53-300	S95DC-52-300	
95-53-320	S95DC-52-320	
95-54-260	S95DC-52-265	CM9
95-55-250	S95DC-52-250	
95-55-285	S95DC-52-280	
95-57-270	S95DC-52-265	CM42
95-61-250	S95DC-52-250	
95-61-260	S95DC-52-265	
95-61-260S	S95DC-52-265	
95-61-265	S95DC-52-265	
95-61-270	S95DC-52-265	
95-61-280	S95DC-52-280	
95-61-285	S95DC-52-280	
95-61-300	S95DC-52-300	
95-61-320	S95DC-52-320	
95-6-235	S95DC-52-235	CM42
95-6-250	S95DC-52-250	CM42
95-6-270	S95DC-52-265	CM42
95-63-265	S95DC-52-265	
96-11-285	S96DC-2-285	
96-19-285	S96DC-2-285	
96-20-285	S96DC-2-285	
96-21-285	S96DC-2-285	
DA25-16-90	D25LD-2-90	
DA3 1/2-52-16	D35LD-7-16	
DA35-52-16	D35LD-7-16	
DA4-126-28	D40DB-7-28.5	
DA4-170-25	D40CD-14-25	
DA45-63-49	D45CD-5-49.12	

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Quick Reference Guide

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DA5 1/2-24-24	D55CC-10-24.25
DA5 1/2-50-24	D55CC-10-24.25
DA5 1/2-51-63	D55CC-6-63
DA5-144-36	D50CC-27-36
DA5-47-27	D50CB-8-27
DA55-24-24	D55CC-10-24.25
DA55-50-24	D55CC-10-24.25
DA55-51-63	D55CC-6-63
DA6 1/4-8-80	D62LB-5-80
DA6-140-79	D60DD-20-79
DA6-156-34	D60CF-3-32.38
DA6-157-30	D60BC-5-30.31 536
DA6-158-42	D60DC-12-42.62
DA6-205-30	D60BC-5-30.31 495
DA6-236-72	D60DB-23-72
DA6-288-42	D60DC-12-42.62
DA6-365-72	D60DB-23-72
DA6-406-30	D60BC-5-30.31 495
DA65-33-80	D62LB-5-80
DA6-68-79	D60DD-20-79
DA6-73-34	D60CD-5-34
DA6-81-30	D60BC-5-30.31 536
DA6-96-72	D60DB-23-72
DA7 1/4-1-80	D72LB-9-80
DA7 1/4-5-80	D72LB-9-80
DA7-107-80	D70LN-5-80
DA7-107-90	D70LN-5-90
DA7-144-80	D70LN-5-80
DA7-144-90	D70LN-5-90
DA7-192-80	D70LN-5-80
DA7-192-90	D70LN-5-90
DA7-241-80	D70LN-5-80
DA7-241-90	D70LN-5-90
DA7-250-152	DA7-250-152
DA725-1-80	D72LB-9-80
DA7-255-80	D70LN-5-80
DA725-5-80	D72LB-9-80
DA7-269-79	D70DD-7-79
DA7-333-79	D70DD-9-79
DA7-43-79	D70DD-9-79
DA7-78-79	D70DD-9-79
DA7-82-78	D70DD-9-79
DAT42-19-112	SD42CC-19-111
DAT42-24-112	SD42CC-19-111
DAT42-58-112	SD42CC-19-111
DAT52-24-112	SD52CC-24-111
DAT52-61-112	SD52CC-24-111
DAT53-125-182	SD53CC-51-182
DAT53-159-156	SD53CD-3-156.88
DAT53-159-168	SD53CD-3-168
DAT53-159-186	SD53CD-3-185.75
DAT53-162-182	SD53CC-51-182
DAT54-3-150	SD64CC-7-152
DAT54-4-118	SD64CC-7-118
DAT54-4-136	SD64CC-7-132
DAT54-5-135	SD64CC-7-132
DAT54-8-118	SD64CC-7-118
DAT54-8-136	SD64CC-7-132
DAT62-1-114	SD62CB-12-114
DAT62-18-79	SD62DB-6-79
DAT62-19-114	SD62CB-12-114
DAT62-2-114	SD62CB-12-114
DAT62-31-114	SD62CB-12-114
DAT62-3-79	SD62DB-6-79
DAT62-55-114	SD62CB-12-114
DAT62-61-79	SD62DB-6-79
DAT62-69-79	SD62DB-6-79
DAT63-120-118	SD63CB-23-118
DAT63-137-118	SD63CB-23-118
DAT63-14-120	SD63DB-14-120
DAT63-145-118	SD63CB-23-118
DAT63-146-120	SD63DB-14-120
DAT63-152-118	SD63CB-23-118
DAT63-155-118	SD63CB-23-118
DAT63-157-118	SD63CB-23-118
DAT63-167-118	SD63CB-23-118
DAT63-209-118	SD63CB-23-118
DAT63-2-118	SD63CB-23-118

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DAT63-37-120	SD63DB-14-120
DAT63-38-118	SD63CB-23-118
DAT63-51-118	SD63CB-23-118
DAT63-63-120	SD63DB-14-120
DAT63-67-118	SD63CB-23-118
DAT63-7-118	SD63CB-23-118
DAT63-95-133	SD63CB-26-132.75
DAT63-95-167	SD63CB-26-167
DAT63-NEED-167	SD63CC-39-167
DAT64-31-136	SD64CC-7-132
DAT64-35-150	SD64CC-7-152
DAT64-53-118	SD64CC-7-118
DAT73-20-120	SD73CC-25-120
DAT73-78-120	SD73CC-25-120
DAT84-11-178	SD84CC-20-178
DAT84-14-152	SD84MC-18-152
DAT84-14-176	SD84MC-18-176
DAT84-38-178	SD84CC-20-178
DAT84-40-178	SD84CC-20-178
DAT84-43-178	SD84CC-20-178
DAT84-50-178	SD84CC-20-178
DAT84-51-152	SD84MC-18-152
DAT84-51-176	SD84MC-18-176
DAT84-57-178	SD84CC-20-178
DAT84-61-178	SD84CC-20-178
DAT85-25-378	SD85CC-19-378
DAT85-26-220	SD85MC-16-220
DAT85-27-220	SD85MC-15-220
DAT85-30-378	SD85CC-19-378
DAT85-36-378	SD85CC-19-378
DAT85-46-220	SD85MC-16-220
DAT85-47-220	SD85MC-15-220
DAT85-51-378	SD85CC-19-378
DAT85-55-378	SD85CC-19-378
DAT85-70-378	SD85CC-19-378
DAT85-72-378	SD85CC-19-378
DAT85-84-378	SD85CC-19-378
DAT85-85-378	SD85CC-19-378
DAT85-93-220	SD85MC-16-220
DAT85-94-220	SD85MC-15-220
DAT9 3/4 6-2-200	SD96CC-3-199
DAT9 3/4 6-3-200	SD96CC-3-199
DAT9 3/4 6-6-199	SD96CC-3-199
DAT9 3/4 6-7-199	SD96CC-3-199
DAT9 3/4 6-8-199	SD96CC-3-199
DAT9 3/4 6-199	SD96CC-3-199
DAT95-27-220	SD95MC-6-220
DAT95-32-160	SD95CC-3-160
DAT95-34-220	SD95MC-6-220
DAT96-10-200	SD96CC-3-199
DAT96-15-480	SD96MC-5-480
DAT96-16-480	SD96MC-5-480
DAT96-17-200	SD96CC-3-199
DAT96-28-480	SD96MC-5-480
DAT96-29-480	SD96MC-5-480
DAT96-37-480	SD96MC-5-480
DAT96-38-480	SD96MC-5-480
DAT96-41-480	SD96MC-5-480
DAT96-4-198	SD96CC-3-199
DAT96-4-199	SD96CC-3-199
DAT96-47-480	SD96MC-5-480
DAT96-48-480	SD96MC-5-480
DAT96-48-492	DAT96-48-492
DAT96-50-480	SD96MC-5-480
DAT96-52-480	SD96MC-5-480
SA4-10-39	S41LC-1-39.38

Daybrook

90345593	S53DC-65-107
98045556	S73DC-66-120 CM11
98045557	S73DC-66-124 CM11

Dempster

AB15905	SD96CC-3-199
AB17393	AB17393
AB19600TH	D60CD-5-34
AB19601TH	D50CB-8-27
AB26635TH	D60CD-5-34

Dempster

AB29246	D25LL-16-24
AB29337	D40DD-19-22.50
AB29406	D35CD-10-20
BB6996	D50CB-8-27
BB6997	D60CD-5-34
BB8112	D60CD-5-34
BB8133-1	D60CD-5-34
BB8134-1	D50CB-8-27
BB8235	D50CB-8-27
CB4753	SD96CC-3-199
CB7599	SD96CC-3-199
CB8217	SD96CC-3-199
DB08142	D35CD-10-20
DB1748	SD96CC-3-199
DB4753	SD96CC-3-199
DB5801	SD96CC-3-199
DB8042	D50CB-8-27
DB8043	D60CD-5-34
DB8142	D35CD-10-20
DB-8142	D35CD-10-20
DB8362	D25LL-16-24
DB-8362	D25LL-16-24
DB8439	D40DD-19-22.50
DB9467	D40DD-19-22.50
EAST MFG	
501-25065-13	S85DC-66-265
501-25110-03	S73DC-66-110
501-25110-13	S73DC-66-110
501-25120-13	S73DC-66-120
501-25127-03	S73DC-66-124
501-25150-03	S73DC-66-150
501-25150-08	S73DC-66-150
501-25237-03	S74DC-74-135
501-25237-08	S74DC-74-135
501-25237-13	S74DC-74-135
501-25250-13	S73DC-66-150
501-25255-13	S73DC-66-150
501-25261-03	S74DC-74-161
501-25261-08	S74DC-74-161
501-25261-13	S74DC-74-161
501-25437-13	S84DC-66-140
501-25445-13	S84DC-66-148
501-25448-03	S84DC-66-148
501-25448-13	S84DC-66-148
501-25460-03	S84DC-66-161
501-25460-08	S84DC-66-156
501-25460-13	S84DC-66-161
501-25480-03	S84DC-66-180
501-25480-13	S84DC-66-180
501-25520-03	S85DC-66-220
501-25520-08	S85DC-66-220
501-25520-13	S85DC-66-220
501-25535-03	S85DC-66-235
501-25535-08	S85DC-66-235
501-25535-13	S85DC-66-235
501-25550-03	S85DC-66-250
501-25550-08	S85DC-66-250
501-25550-13	S85DC-66-250
501-25562-13	S85DC-66-160
501-25565-03	S85DC-66-265
501-25565-08	S85DC-66-265
501-25565-13	S85DC-66-265
501-25569-10	S95DC-52-250 CM22
501-25570-13	S85DC-66-170
501-25585-03	S85DC-66-285
501-25585-13	S85DC-66-285
501-25590-03	S85DC-66-190
501-25590-13	S85DC-66-190
501-25600-03	S95DC-52-300
501-25600-08	S95DC-52-300
501-25600-13	S95DC-52-300
501-25650-03	S95DC-52-250
501-25665-03	S95DC-52-265
501-25665-13	S95DC-52-265
501-25680-03	S95DC-52-280
501-25680-13	S95DC-52-280

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Note: In some applications, modifications may be required for proper cylinder installation.



Quick Reference Guide

Edbro

058003223.....	S53DC-65-104
058003247.....	S53DC-65-120
058003401.....	S63DC-101-107
058003440.....	S63DC-97-111
058003488.....	S63DC-101-140
058003820.....	S85DC-66-235
TE11-3-2660.....	S53DC-65-104
TE11-3-2960.....	S53DC-65-120
TE14-3-2670.....	S63DC-101-107
TE14-3-2850.....	S63DC-97-111
TE14-3-3450.....	S63DC-101-140
TE18-5-6170.....	S85DC-66-235

Energy

A277	D60DB-23-72
A3525	D70LN-5-80
A6430	D60DB-23-72

Esp Mfg / Dragon

243-7004	SD63CB-23-118
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Everlite

9055001.....	S85DC-66-265
9055004.....	S85DC-66-190
9055008.....	S85DC-66-250
9055010.....	S85DC-66-220
9055025.....	S74DC-74-161
9055039.....	S84DC-66-161

Fontaine

53110.....	S53DC-65-107 CM27
5385.....	S53DB-18-90
63110.....	S63DC-101-107 CM17
63126.....	S63DC-97-123 CM63
63142.....	S63DC-101-140 CM17
6385.....	S63DC-101-86 CM17
6397.....	S63DC-101-92 CM17
73110.....	S73DC-66-110 CM20
73115.....	S73DC-66-110 CM20
73126.....	S73DC-66-124 CM20
73142.....	S73DC-66-140 CM20
84142.....	S84DC-66-140 CM20
84152.....	S84DC-66-148 CM20
84164.....	S84DC-66-156 CM20
84172.....	S84DC-66-170 CM20
84188.....	S84DC-66-180 CM20
85172.....	S85DC-66-160 CM18
85197.....	S85DC-66-190 CM53
DCH-31-351.....	S85DC-66-190 CM53
DCH-31-359.....	S85DC-66-160 CM18
DCH-31-374.....	S84DC-66-156 CM20
DCH-31-388.....	S84DC-66-148 CM20
DCH-31-413.....	S84DC-66-170 CM20
DCH-31-427.....	S73DC-66-140 CM20
DCH-31-433.....	S73DC-66-124 CM20
DCH-31-439.....	S73DC-66-110 CM20
DCH-31-462.....	S84DC-66-140 CM20
DCH-31-476.....	S63DC-101-140 CM17
DCH-31-483.....	S63DC-97-123 CM63
DCH-31-487.....	S63DC-101-107 CM17
DCH-31-491.....	S63DC-101-92 CM17
DCH-31-495.....	S63DC-101-86 CM17
DCH-31-499.....	S53DC-65-107 CM27
DCH-31-507.....	S53DB-18-90
DCH-31-519.....	S84DC-66-180 CM20
DCH-31-536.....	S73DC-66-110 CM20

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251147.....	S84DC-66-170
251147-2.....	S84DC-66-170
ECA-8950.....	S85MC-48-220
ECA-8951.....	S85MC-48-235
ECA-9287.....	S85MC-48-200
ECB-009287.....	S85MC-48-200
ECB-2353 X.....	S85DC-66-235
ECB-2353-1.....	S85DC-66-220
ECB-2353-10.....	S85DC-66-170
ECB-2353-101.....	S85DC-66-220

Fruehauf

ECB-2353-12.....	S84DC-66-156
ECB-2353-13.....	S73DC-66-120 CM4
ECB-2353-14.....	S74DC-74-156 CM4
ECB-2353-15.....	S63DC-101-120 CM36
ECB-2353-17.....	S84DC-66-140
ECB-2353-18.....	S74DC-74-140 CM4
ECB-2353-19.....	S84DC-66-148 CM2
ECB-2353-2.....	S85DC-66-190
ECB-2353-20.....	S63DC-101-107 CM36
ECB-2353-21.....	S63DC-101-104 CM36
ECB-2353-22.....	S84DC-66-140
ECB-2353-23.....	S95DC-52-250
ECB-2353-24.....	S95DC-52-265
ECB-2353-25.....	S85DC-66-250
ECB-2353-26.....	S85DC-66-235
ECB-2353-27.....	S85DC-66-220
ECB-2353-28.....	S95DC-52-250
ECB-2353-29.....	S85DC-66-265
ECB-2353-3.....	S84DC-66-148
ECB-2353-30.....	S85DC-66-235 CM2
ECB-2353-31.....	S85DC-66-250 CM2
ECB-2353-32.....	S85DC-66-265 CM2
ECB-2353-33.....	S95DC-52-265
ECB-2353-35.....	S96DC-2-285
ECB-2353-37.....	S85DC-66-265 CM2
ECB-2353-38.....	S84DC-66-148
ECB-2353-39.....	S85DC-66-265
ECB-2353-41.....	S63DC-101-120 CM36
ECB-2353-42.....	S85DC-66-190
ECB-2353-43.....	S85DC-66-190 CM2
ECB-2353-44.....	S85DC-66-220 CM2
ECB-2353-45.....	S96DC-2-285
ECB-2353-46.....	S95DC-52-250 CM42
ECB-2353-47.....	S95DC-52-220
ECB-2353-48.....	S95DC-52-235
ECB-2353-5.....	S85DC-66-250 CM2
ECB-2353-52.....	S95DC-52-280
ECB-2353-53.....	S95DC-52-250 CM42
ECB-2353-54.....	S85DC-66-190
ECB-2353-55.....	S85DC-66-220
ECB-2353-56.....	S85DC-66-190
ECB-2353-57.....	S85DC-66-220
ECB-2353-6.....	S85DC-66-235 CM2
ECB-2353-7.....	S85DC-66-220 CM2
ECB-2353-706.....	S85DC-66-235
ECB-2353-724.....	S95DC-52-265
ECB-2353-8.....	S85DC-66-190 CM2
ECB-2353-9.....	S85DC-66-250
ECBH2353-1.....	S85DC-66-220
ECBH2353-10.....	S85DC-66-170
ECBH2353-12.....	S84DC-66-148
ECBH2353-2.....	S85DC-66-190
ECBH2353-29.....	S85DC-66-265
ECBH2353-3.....	S84DC-66-140
ECBH2353-5.....	S85DC-66-250 CM2
ECBH2353-54.....	S85DC-66-190
ECBH2353-55.....	S85DC-66-220
ECBH2353-58.....	S85DC-66-197
ECBH2353-6.....	S85DC-66-235 CM2
ECBH2353-9.....	S85DC-66-250
ECBH2353-X.....	S85DC-66-235
ECC-3366-1.....	S63DC-101-107 CM16
ECC-3366-2.....	S63DC-101-120 CM16
ECC-3366-3.....	S63DC-96-130 CM16
ECE-7681-2.....	S73DC-66-120 CM4
ECE-7681-3.....	S74DC-74-156 CM4
ECE-7681-4.....	S63DC-101-120 CM36
ECE-7681-6.....	S74DC-74-140 CM4
ECE-7681-7.....	S63DC-101-107 CM36
ECE-7681-8.....	S74DC-74-140 CM4
MCU-007401-140.....	S74DC-74-140
MCU-008413-170.....	S84DC-66-170
MCU-008502-190.....	S85DC-66-190
MCU-008520-250.....	S85DC-66-250
MCU-574DC4-16.....	S74DC-74-161
MHC-030656.....	S53MB-3-120
MHC-030657.....	S95DC-52-235 CM42
MHC-030663.....	S84DC-66-156

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MHC-030665.....	S95DC-52-190 CM42
MHC-030666.....	S84DC-66-170
MHC-030667.....	SD63DB-14-120
MHC-030668.....	S95DC-52-220 CM42
MHC-030671.....	S74DC-74-135 CM4
MHC-030673.....	S63MB-8-140
MHC-030676.....	S85DC-66-265
MHC-030680.....	S74DC-77-135
MHC-030682.....	S74DC-74-120 CM4
MHC-030684.....	S95DC-52-250 CM42
MHC-030685.....	S63MB-11-108
MHC-030686.....	S85DC-66-190
MHC-030692.....	S73DC-66-140 CM4
TWC-1391-1.....	S85DC-66-220
TWC-1391-10.....	S85DC-66-170
TWC-1391-12.....	S84DC-66-156
TWC-1391-13.....	S73DC-66-120 CM4
TWC-1391-14.....	S74DC-74-156 CM4
TWC-1391-15.....	S63DC-101-120 CM36
TWC-1391-17.....	S84DC-66-140
TWC-1391-18.....	S74DC-74-140 CM2
TWC-1391-19.....	S84DC-66-148 CM2
TWC-1391-2.....	S85DC-66-190
TWC-1391-20.....	S63DC-101-107 CM36
TWC-1391-21.....	S63DC-101-104 CM36
TWC-1391-22.....	S84DC-66-140
TWC-1391-23.....	S95DC-52-250
TWC-1391-24.....	S95DC-52-235
TWC-1391-25.....	S95DC-52-190
TWC-1391-27.....	S85DC-66-220
TWC-1391-29.....	S85DC-66-265
TWC-1391-3.....	S84DC-66-148
TWC-1391-35.....	S96DC-2-285
TWC-1391-37.....	S85DC-66-265
TWC-1391-38.....	S84DC-66-148
TWC-1391-46.....	S95DC-52-250 CM42
TWC-1391-47.....	S95DC-52-220
TWC-1391-48.....	S95DC-52-235
TWC-1391-5.....	S85DC-66-250
TWC-1391-6.....	S85DC-66-235
TWC-1391-7.....	S85DC-66-220
TWC-1391-8.....	S85DC-66-190
TWC-1391-9.....	S85DC-66-250
TWC-1391-X.....	S85DC-66-235
TWC-1392-2.....	S85DC-66-190
TWC-1392-3.....	S84DC-66-148
TWC-1392-9.....	S85DC-66-250
TWC-1392-X.....	S85DC-66-235
TWC-1411-1.....	S84DC-66-156
TWC-1411-2.....	S73DC-66-120 CM4
TWC-1411-3.....	S74DC-74-156 CM4
TWC-1411-4.....	S63DC-101-120 CM36
TWC-1411-5.....	S84DC-66-140
TWC-1411-6.....	S74DC-74-135 CM4
TWC-1411-7.....	S63DC-101-107 CM36

G&H Mfg

020210.....	D70DD-9-79
50393.....	D70DD-9-79
6040004A.....	D60DD-20-79
7X116GH22778.....	SD73DB-10-115
A4456.....	D45DD-8-16.75
AM1161.....	D70DD-9-79
AM-1161.....	D70DD-9-79
AM1162.....	D60DD-20-79
AM-1162.....	D60DD-20-79
FA1001.....	D60DD-20-79
FA1002.....	D70DD-9-79
H1014.....	D70DD-9-79
H1015.....	D60DD-20-79
H1020.....	D40CD-16-29.50
H1238.....	D45DD-8-16.75
H2208.....	SD73DB-10-115
H2985.....	D60DD-20-79
H3291.....	D60DD-20-79
H3292.....	D70DD-9-79
H3930.....	H3930
H5166.....	SD73DB-10-115

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Quick Reference Guide

G&H Mfg

H5176	D70DD-9-79
H5393	SD73DB-10-115
P1331	D60DD-20-79
PH-020-002	D40CD-16-29.50
PH-020-168	D60DD-20-79
PH-020-201	D70DD-9-79

Galbreath

1039	D60DB-23-72
1043	D60DB-23-72
1054	D70LN-5-80
1111	SD63CB-23-118
1126	D60DB-23-72
2419	SD62CB-12-114
2455	D70LN-5-90
2460	D70LN-5-80
2463	D70LN-5-90
3116	SD62CB-12-114
3139	SD62CB-12-114
3412	D60DB-23-72
3891	D40CD-16-29.50
3902	SD62CB-12-114
9846	D70LN-5-90
9920	D60DB-23-72
9921	D70LN-5-80
A1002	S84DC-66-188
A1011	S84DC-66-170
A1056	SD85CC-19-378
A1206	S85DC-66-265
A1430	S84DC-66-156
A1527	D60DB-23-72
A1529	D70LN-5-80
A1536	S84DC-66-148
A1537	S84DC-66-170
A1538	S85DC-66-190
A1539	S85DC-66-220
A1540	S85DC-66-235
A1541	S85DC-66-250
A1542	S85DC-66-265
A1587 (95300)	S95DC-52-300
A1606	SD63CB-23-118
A1717	D70LN-5-80
A1745	SD63CB-23-118
A1793	D60DB-23-72
A1825 (84148)	S84DC-66-148
A1826 (84170)	S84DC-66-170
A1827 (85190)	S85DC-66-190
A1828 (85220)	S85DC-66-220
A1829 (85235)	S85DC-66-235
A1830 (85250)	S85DC-66-250
A1831 (85265)	S85DC-66-265
A1897	D70LN-5-80
A1898	D70LN-5-90
A1905	S95DC-52-235
A1961	S95DC-52-220
A1968	D70LN-5-80
A1969	D70LN-5-90
A2083	SD62CB-12-114
A2190	D40CD-16-29.50
A2349	S85DC-66-285
A2564	S95DC-52-250
A2870	S85DC-66-285
A3137	D60DB-23-72
A3147	D70LN-5-80
A3149	D70LN-5-90
A3167	SD62CB-12-114
A3173	SD63CB-23-118
A3377	SD62CB-12-114
A3383	SD63CB-23-118
A3701	SD63CB-23-118
A4543	D60DD-20-79
A4545	D70DD-9-79
A5325	D70LN-5-80
A5331	D60DB-23-72
B1043	D60DB-23-72
B2455	D70LN-5-90
B2460	D70LN-5-80

Galfab

PC145	D70LN-5-80
PC150	D70LN-5-90
PC5	SD63CB-23-118

Godwin

5384-C	S53DC-66-84
5384-H	S53DC-66-84
63120-H	S63DC-97-123
63123-C	S63DC-97-123
73124-C	S73DC-66-124
73124-H	S73DC-66-124
74135-C	S74DC-74-135
74135-H	S74DC-74-135
G5390T	S53MB-5-90

Great Bend

13804GB	SD85MC-15-220
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Green Mfg

600-2570	D55CC-10-24.25
600-2602	D50CC-27-36
600-2812	S41LC-1-39.38
600-2831	D60BC-5-30.31 495
600-3193	D30LL-6-36
600-3194	D35LC-1-60
600-3195	D35LC-1-80

Heil

1-1344	SD64CC-7-132
1-1766	S53DC-68-105
1-1972	S53DC-68-99
1-1973	S53DC-68-120
1-1974	S53DC-68-123
1-2039	S52CC-41-54.62
1-2039-1	S52CC-41-54.62
1-2043	S63DC-102-120
1-2044	S63DC-102-126
1-2123	SD64CC-7-152
1-2298	S63DC-102-138
1-2624	S63DC-102-162
1-2634	S63DC-102-162
1-3058	S53DC-68-120
1-3139	S53DC-68-123
1-3140	S53DC-68-99
1-3141	S53DC-68-105
1-3177	S63DC-102-120
1-3178	S63DC-102-126
1-3179	S63DC-102-138
1-3180	S63DC-102-162
1-3391	SD64CC-7-118
1-3484	S53DC-68-105
1-3689	SD96CC-3-199
1-3717	D25LD-2-90
1-3727	D30CA-2-3.62
1-3830	SD64CC-7-132
1-3836	SD64CC-7-118
1-3843	SD64CC-7-152
1-3860	S53DC-68-123
1-3871	SD64CC-7-132
1-3878	S63DC-96-130
1-3887	S53DC-68-99
1-3888	S53DC-68-105
1-3889	S53DC-68-120
1-3890	S53DC-68-123
1-3891	S63DC-102-120
1-3892	S63DC-102-126
1-3893	S63DC-102-138
1-3983	S53DC-68-99
1-3984	S53DC-68-105
1-3985	S53DC-68-120
1-3986	S53DC-68-123
1-3998	S63DC-102-120
1-3999	S63DC-102-126
1-4000	S63DC-102-138
1-4001	S63DC-102-162
1-4050	SD64CC-7-132
1-4053	SD64CC-7-118
1-4054	SD64CC-7-152

Heil

1-4137	S53DC-68-99
1-4138	S53DC-68-105
1-4139	S53DC-68-120
1-4140	S53DC-68-123
1-4141	S63DC-102-120
1-4142	S63DC-102-126
1-4143	S63DC-102-138
1-4144	S63DC-102-162
1-4347	D55CC-10-24.25
1-4807	S52CC-41-54.62
1-4815	S53DC-68-120
1-4824	D55CC-10-24.25
1-4828	D50CC-27-36
1-4868	D40CD-14-25
1-4884	D50CC-27-36
1-4887	D55CC-10-24.25
1-4891	S52DB-9-67.50
1-4903	D40CD-8-22
1-4915	D50CC-24-34.19
1-5070	SD53CC-51-151.5
1-5088	D30CC-17-28.19
1-5098	D45CC-19-41.50
1-5110	D50CC-27-36
1-5111	D55CC-10-24.25
1-5146	D55CC-6-63
1-5147	SD53CC-51-182
1-5149	SD53CC-51-151.5
1-5150	D45CC-19-41.50
1-5173	S53MB-3-120
1-5174	S63MB-9-120
1-5175	S63MB-8-140
1-6067	SD53CC-51-182
1-6069	D40CD-13-37
1-6070	D30CC-13-21.62
1-6076	SD53CC-51-182
1-6078	SD53CC-51-151.5
1-6093	D30CC-27-27.50
1-6117	S63DC-79-67
1-6121	S52DB-9-67.50
1-6122	S53MB-3-120
1-6126	D40CC-27-19
1-6135	S63MB-9-120
1-6142	D30CC-13-21.62
1-6152	S63MB-8-140
1-6153	D30CA-2-3.62
1-6155	S63DC-102-150
1-6157	S52CC-41-54.62
1-6160	D30CC-20-8.00
1-6161	D30CC-19-16.00
1-6162	D17AE-2-71.88
1-6163	D30CE-11-18.50
1-6164	D50CC-25-43
1-6169	D30CC-18-8.00
1-6184	S63MB-8-160
1-6191	S52CC-41-54.62
1-6194	D17AE-2-71.88
1-6230	D50CC-6-63
1-6247	SD53CC-51-182
1-6248	D30CC-27-27.50
1-6252	SD53CC-51-151.5
1-6298	D30CC-27-27.50
1-6316	SD53CC-51-151.5
1-6318	SD53CC-51-182
1-6330	D30CC-18-8.00
1-6331	D30CC-18-8.00
1-6369	D40CD-14-25
1-6370	D45CC-19-41.50
1-6384	D40CD-8-22
1-6385	D40CC-27-19
1-6386	D25LD-2-90
1-6388	D45CC-19-41.50
1-6399	D17AE-2-71.88
1-6402	D30CC-18-8.00
1-6403	D17AE-2-71.88
1-6404	D30CC-19-16.00
1-6405	D30CE-11-18.50
1-6406	D50CC-25-43
1-6407	D30CC-20-8.00

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Heil

1-6416	D30CC-18-8.00
1-6425	S52CC-41-67.25
1-6427	SD64DC-7-133.12
1-6445	S52CC-41-54.62
1-6456	D55CC-9-35.88
1-6457	D55CC-7-24
1-6521	D30CC-17-28.19
1-6522	D30CA-2-3.62
1-6525	D55CC-6-63
1-6554	D30CE-11-18.50
1-6560	D50CC-24-34.19
1-6581	D50CC-25-43
1-6597	SD53CC-51-182
1-6598	SD53CC-51-151.5
1-6610	D50CC-27-36
1-6611	D55CC-10-24.25
1-6666	D32CC-15-16
1-6669	D40CC-14-25
1-6670	D40CD-8-22
1-6671	D40CC-27-19
1-6703	S53DC-68-123
1-6704	S63DC-102-126
1-6705	S63DC-102-138
1-6711	S53DC-68-105
1-6712	S53DC-68-120
1-6714	S63DC-102-120
1-6715	S63DC-102-150
1-6716	S63DC-102-162
1-6720	D30CA-2-3.62
1-6721	D30CC-17-28.19
1-6757	D17AE-2-71.88
1-6767	D32CC-15-16
1-6777	D40CC-14-25
1-6813	D45CC-19-41.50
1-6819	D30CC-27-27.50
1-6445	S52CC-41-54.62

Henderson Mfg

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Hercules Hyd

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SHC-M32DB-50	S32DB-3-50 CM72
SHC-M42DB-43	S42DB-8-43 CM72
SHC-M42DB-50	S42DB-8-51 CM72
SHC-M43DB-75	S43DB-3-75 CM72
SHC-M53DB-60	S53DB-13-60
SHC-M53MB-90	S53MB-5-90

Hilbilt / Commercial

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SA63DB-1-120	S63DC-101-120 CM26
SA63DB-1-130	S63DC-96-130 CM26
SA63DB-1-140	S63DC-101-140 CM26

Huge Haul

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4-01-0207	SD63CB-23-118

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010-9901-4	D25LL-14-42
010-9902	D25LL-15-84
010-9902-4	D25LL-15-84
014-0208-0	D35CD-11-19
014-9900	D35LD-5-19
014-9900-4	D35LD-5-19
016-6091	D45LD-7-45.38
016-9900	D40CL-13-45.38
016-9900-0	D40CL-13-45.38
018-9900	D45LD-7-45.38
018-9900-4	D45LD-7-45.38
020-9900	D50DD-25-40
020-9900-0	D50DD-25-40
024-0310-0	D60DD-20-79
028-0314-0	D70DD-9-79
095-6024-2	SD53CD-3-156.88

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095-6024-4	SD53CD-3-156.88
095-6029	SD53CD-3-168
095-6029-2	SD53CD-3-168
095-6029-4	SD53CD-3-168
095-6038	SD53CD-3-185.75
10000-84-140	S84DC-66-140
10000-84-148	S84DC-66-148
10000-84-156	S84DC-66-156
10000-84-175	S84DC-66-170
10000-85-190	S85DC-66-190
10000-85-220	S85DC-66-220
10001-85-235	S85DC-66-235
10001-85-250	S85DC-66-250
10002-73-120	S73DC-66-120 CM4
10002-74-140	S74DC-74-140 CM4
10002-74-156	S74DC-74-156 CM4
10002-74-175	S84DC-66-170
10003-63-108	S63DC-101-107 CM36
10003-63-120	S63DC-101-120 CM36
10003-63-98	S63DC-101-104 CM36
10004-84-156	S84DC-66-156
10004-84-190	S84DC-66-188
10014-825-190	S85DC-66-190
10014-825-220	S85DC-66-220 CM2
10015-825-235	S85DC-66-235
10015-825-250	S85DC-66-250
10016-84-180	S84DC-66-180 CM21
10023-85-200	S85DC-66-197 CM46
10023-85-205	S85DC-66-197 CM46
10023-85-220	S85DC-66-220 CM46
10027-63-102	S63DC-101-104
10027-63-108	S63DC-101-107
10027-63-120	S63DC-101-120
10027-63-132	S63DC-96-130
10027-63-156	S63DC-101-150
10027-63-84	S63DC-101-86
10027-63-90	S63DC-101-86
10027-64-156	S64DC-14-156
10029-85-235	S85DC-66-235
10029-85-250	S85DC-66-250
10038-85-190T	S85MC-48-200
10038-85-220T	S85MC-48-220
10041-74-118	S74DC-74-120
10041-74-138	S74DC-74-135
10042-85-170	S85DC-66-170
10048-63-140T	S63MB-8-140
10050-73-120	S73DC-66-120 CM38
10050-73-135	S73DC-66-129 CM38
10050-74-135	S74DC-77-135
10050-74-140	S74DC-77-135
10050-74-164	S74DC-74-161 CM38
10051-74-154T	S74MB-3-154
10051-74-172T	S74MB-3-172
10052-53-120T	S53MB-3-120
10053-42-90T	S42MB-3-90
10054-85-190T	S85MC-48-200 CM53
10054-85-200T	S85MC-48-200 CM53
10054-85-220T	S85MC-48-220 CM53
10060-63-120T	S63MB-9-120
10060-63-140T	S63MB-8-140
10060-64-140T	S64MB-4-140
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10098-74-140H	S74DC-74-140 CM4
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10099-63-108H	S63DC-101-107 CM36
10099-63-120H	S63DC-101-120 CM36
10127-64-140H	S74DC-74-140 CM4
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10156-935-220	S95DC-52-220 CM42
10156-935-235	S95DC-52-235 CM42
10156-935-250	S95DC-52-250 CM42
1054A-87654-204	S85DC-66-197 CM9
1109A-87654-235	S85MC-48-235
1139A-543-119	S53MB-3-120

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1139A-543-120	S53MB-3-120
1139A-543-120T	S53MB-3-120
1139A-654-104	S63MB-11-108
1139A-654-108	S63MB-11-108
1139A-654-110	S63MB-11-108
1139A-654-119	S63MB-9-120
1139A-654-140	S63MB-8-140
1139A-6543-140	S64MB-4-140
1139A-7654-150	S74MB-3-154
1139A-7654-154	S74MB-3-154
1168A-87654-190	S85MC-48-200
1168A-87654-220	S85MC-48-220
1174A-87654-190T	S85MC-48-200 CM53
1174A-87654-200T	S85MC-48-200 CM53
1174A-87654-220T	S85MC-48-220 CM53
1221A-654-119	S63DC-101-120
1221A-7654-119	S74DC-74-120
1221A-7654-137	S74DC-74-135
1221A-8765-137	S84DC-66-140
1221A-87654-166	S85DC-66-170
1221A-87654-195	S85DC-66-190
1221A-87654-220	S85DC-66-220
1296A-975-8765-190	S95DC-52-190 CM42
1296A-975-8765-220	S95DC-52-220 CM42
1296A-975-8765-235	S95DC-52-235 CM42
1296A-975-8765-250	S95DC-52-250 CM42
1315A-87654-235	S85DC-66-235
1317A-7654-175	S84DC-66-170
1317A-8765-150	S84DC-66-148
1317A-8765-175	S84DC-66-170
1317A-87654-190	S85DC-66-190
1317A-87654-220	S85DC-66-220
1325A-825-765-150	S84DC-66-148 CM2
1325A-825-765-182	S84DC-66-180
1325A-825-7654-170	S85DC-66-170 CM2
1325A-825-7654-190	S85DC-66-190
1325A-825-7654-195	S85DC-66-190 CM2
1325A-825-7654-204	S85DC-66-197 CM2
1325A-825-7654-220	S85DC-66-220
1325A-825-7654-235	S85DC-66-235
1325A-825-7654-250	S85DC-66-250
1325A-825-7654-252	S85DC-66-250 CM2
1395A-8765-148	S84DC-66-148 CM21
1395A-8765-160	S84DC-66-156 CM21
1395A-8765-164	S84DC-66-161 CM21
1395A-8765-180	S84DC-66-180 CM21
1395A-8765-182	S84DC-66-180 CM21
1395A-87654-195	S85DC-66-190 CM21
1395A-87654-220	S85DC-66-220 CM21
1427A-654-104	S63DC-101-104 CM9
1503A-7654-119	S74DC-74-120 CM26
1503A-7654-135	S74DC-74-135 CM26
1503A-8765-153	S84DC-66-148 CM19
1542A-87654-250	S85DC-66-250
1548A-654-108	S63DC-101-107 CM16
1548A-654-119	S63DC-101-120 CM16
1584A-87654-170	S85DC-66-170
1617A-87654-220	S85DC-66-220
1672A-654-120	S63DC-101-120
1741A-87654-220	S85DC-66-220
1761A-654-120	SD63DB-14-120
1788A-8765-182	S84DC-66-180
1788A-87654-220	S85DC-66-220
1913A-654-108	S63DC-101-107 CM36
1913A-654-120	S63DC-101-120 CM36
1913A-765-120	S73DC-66-120 CM4
1913A-7654-141	S74DC-74-140 CM4
1913A-7654-156	S74DC-74-156 CM4
1913A-8765-141	S84DC-66-140
1913A-8765-156	S84DC-66-156
1920A-765-120	S73DC-66-120 CM38
1920A-765-135	S73DC-66-129 CM38
1920A-7654-135	S74DC-77-135
1920A-7654-140	S74DC-77-135
1920A-7654-164	S74DC-74-161 CM38
1936A-765-140	S73DC-66-140
1942A-8765-156	S84DC-66-156
1942A-8765-190	S84DC-66-188

Crossover and Application Data is for Reference Purpose Only. No Other Conditions are Expressed or Implied.

Note: It is the Users Responsibility to Verify if the Replacement Cylinder is Interchangeable.

Note: In some applications, modifications may be required for proper cylinder installation.



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1967A-7654-158.....	S74DC-74-156 CM45
1967A-8765-138.....	S84DC-66-140 CM38
1967A-8765-152.....	S84DC-66-156 CM38
1967A-8765-162.....	S84DC-66-161 CM38
1967A-8765-170.....	S84DC-66-170 CM38
1967A-8765-187.....	S84DC-66-188 CM38
20028-96-198.....	SD96CC-3-199
20032-916-198.....	SD96CC-3-199
20043-63-120.....	SD63DB-14-120
20059-84-178.....	SD84CC-20-178
20089-42-112.....	SD42CC-9-111
20099-64-132.....	SD64CC-7-132
20099-64-152.....	SD64CC-7-152
20124-63-120.....	SD63DB-14-120
20134-62-114.....	SD62CB-12-114
20155-64-134.....	SD64CC-7-132
20158-64-118.....	SD64CC-7-118
20170-85-378.....	SD85CC-19-378
20184-63-120.....	SD63DB-14-120
20223-64-132.....	SD64CC-7-132
20223-64-152.....	SD64CC-7-152
20234-63-118.....	SD63CB-23-118
20235-52-111.....	SD52CC-24-111
20237-62-114.....	SD62CB-12-114
20254-916-480.....	SD96MC-5-480
20258-915-160.....	SD95CC-3-160
20283-74-164.....	20283-74-164
20318-63-118.....	SD63CB-23-118
20348-62-114.....	SD62CB-12-114
20565-85-378.....	SD85CC-19-378
20577-63-167.....	SD63CB-26-167
20580-63-132.....	SD63CB-26-132.75
20601-63-120.....	SD63DB-14-120
20641-63-120.....	SD63DB-14-120
20683-63-118.....	SD63CB-23-118
207374-62-114.....	SD62CB-12-114
20738-63-118.....	SD63CB-23-118
30000-83-132.....	S83DC-56-134
30000-83-138.....	S83DC-56-139
30000-83-160.....	S84DC-66-170
30000-84-140.....	S84DC-66-140
30000-84-148.....	S84DC-66-148
30000-84-156.....	S84DC-66-156
30000-84-164.....	S84DC-66-161
30000-84-168.....	S84DC-66-161
30000-84-170.....	S84DC-66-170
30000-84-175.....	S84DC-66-170
30000-84-180.....	S84DC-66-180
30000-84-188.....	S84DC-66-188
30000-84-190.....	S84DC-66-188
30000-85-160.....	S85DC-66-160
30000-85-165.....	S85DC-66-160
30000-85-170.....	S85DC-66-170
30000-85-190.....	S85DC-66-190
30000-85-195.....	S85DC-66-190
30000-85-200.....	S85DC-66-197
30000-85-220.....	S85DC-66-220
30001-85-225.....	S85DC-66-220
30001-85-235.....	S85DC-66-235
30001-85-250.....	S85DC-66-250
30001-85-260.....	S85DC-66-265
30001-85-265.....	S85DC-66-265
30001-85-270.....	S85DC-66-265
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30009-84-148.....	S84DC-66-148 CM21
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30009-84-164.....	S84DC-66-161 CM21
30009-84-180.....	S84DC-66-180 CM21
30009-84-182.....	S84DC-66-180 CM21
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30016-73-130.....	S73DC-66-129 CM4
30016-73-132.....	S73DC-66-129 CM4

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30016-73-141.....	S73DC-66-140 CM4
30016-73-150.....	S73DC-66-150 CM4
30016-73-151.....	S73DC-66-150 CM4
30016-74-120.....	S74DC-74-120 CM4
30016-74-135.....	S74DC-74-135 CM4
30016-74-136.....	S74DC-74-135 CM4
30016-74-140.....	S74DC-74-140 CM4
30016-74-156.....	S74DC-74-156 CM4
30016-74-164.....	S74DC-74-161 CM4
30016-74-166.....	S74DC-74-161 CM4
30016-74-168.....	S74DC-74-161 CM4
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30020-85-190T.....	S85MC-48-200
30020-85-200T.....	S85MC-48-200
30020-85-204T.....	S85MC-48-200
30020-85-220T.....	S85MC-48-220
30020-85-225T.....	S85MC-48-220
30020-85-235T.....	S85MC-48-235
30021-63-104.....	S63DC-101-104 CM36
30021-63-108.....	S63DC-101-107 CM36
30021-63-120.....	S63DC-101-120 CM36
30021-63-126.....	S63DC-97-123 CM36
30021-63-132.....	S63DC-96-130 CM36
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30021-63-84.....	S63DC-101-86 CM36
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30022-825-265.....	S85DC-66-265
30023-85-170.....	S85DC-66-170
30025-935-190.....	S95DC-52-190 CM42
30025-935-220.....	S95DC-52-220 CM42
30025-935-235.....	S95DC-52-235 CM42
30025-935-240.....	S95DC-52-235 CM42
30025-935-250.....	S95DC-52-250 CM42
30025-935-255.....	S95DC-52-250 CM42
30025-935-265.....	S95DC-52-265 CM42
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30038-915-220.....	S95DC-52-220 CM4
30038-915-235.....	S95DC-52-235 CM4
30038-915-250.....	S95DC-52-250 CM4
30038-915-265.....	S95DC-52-265 CM4
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30042-85-235.....	S85DC-66-235
30042-85-250.....	S85DC-66-250
30043-85-200.....	S85DC-66-197 CM46
30043-85-205.....	S85DC-66-197 CM46
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30044-85-235.....	S85DC-66-235 CM46
30044-85-250.....	S85DC-66-250 CM46
30044-85-260.....	S85DC-66-265 CM46
30048-73-120.....	S73DC-66-120 CM38
30048-74-135.....	S74DC-77-135
30048-74-140.....	S74DC-74-140 CM38
30048-74-164.....	S74DC-74-161 CM38
30049-42-82T.....	S42MB-3-90
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30049-42-86T.....	S42MB-3-90
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30050-63-108T.....	S63MB-11-108
30050-63-120T.....	S63MB-9-120
30050-63-140T.....	S63MB-8-140
30050-64-140T.....	S64MB-4-140

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30057-53-72.....	S53DC-66-72
30057-53-78.....	S53DC-66-72
30057-53-84.....	S53DC-66-84
30057-53-90.....	S53DC-66-84
30058-74-154T.....	S74MB-3-154
30058-74-172T.....	S74MB-3-172
30060-85-235T.....	S85MC-48-235
30060-85-250T.....	S85MC-48-250
30060-85-265T.....	S85MC-48-265
30060-85-280.....	S85MC-48-280
30061-63-98.....	S63DC-101-104 CM36
30062-85-190T.....	S85MC-48-200 CM53
30062-85-200T.....	S85MC-48-200 CM53
30062-85-220T.....	S85MC-48-220 CM53
30063-85-170H.....	S85DC-66-170
30063-85-190H.....	S85DC-66-190
30064-73-120H.....	S73DC-66-120 CM4
30064-74-140H.....	S74DC-74-140 CM4
30064-74-156H.....	S74DC-74-156 CM4
30064-75-170H.....	S85DC-66-170
30065-63-108H.....	S63DC-101-107 CM36
30065-63-120H.....	S63DC-101-120 CM36
30066-64-140H.....	S74DC-74-140 CM4
30070-63-104.....	S63DC-101-104 CM43
30070-63-105.....	S63DC-101-107 CM43
30070-63-108.....	S63DC-101-107 CM43
30070-63-120.....	S63DC-101-120 CM45
30070-63-84.....	S63DC-101-86 CM43
30071-73-126.....	S73DC-66-124 CM9
30071-74-148.....	S74DC-74-140 CM9
30072-53-120T.....	S53MB-3-120
30097-63-105.....	S63DC-101-107
30097-63-108.....	S63DC-101-107
30097-63-111.....	S63DC-97-111
30097-63-120.....	S63DC-101-120
30097-63-132.....	S63DC-96-130
30097-63-156.....	S63DC-101-150
30097-63-81.....	S63DC-101-86
30097-63-93.....	S63DC-101-86
30097-64-156.....	S64DC-14-156
30122-84-164.....	S84DC-66-161 CM38
30122-84-188.....	S84DC-66-188 CM38
30125-935-265.....	S95DC-52-265
30125-935-270.....	S95DC-52-265 CM42
30125-935-280.....	S95DC-52-280
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30129-63-108T.....	S63MB-11-108
30129-63-140T.....	S63MB-8-140
30129-63-144T.....	S63MB-8-140
30129-63-150T.....	S63MB-8-150
30129-64-140T.....	S64MB-4-140
30146-63-129.....	S63DC-96-130
30164-825-250.....	S85DC-66-250 CM46
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30181-53-120.....	S53DC-65-120
30195-73-108.....	S73DC-66-110
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30195-73-123.....	S73DC-66-120
30195-73-126.....	S73DC-66-124
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30195-73-150.....	S73DC-66-150
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30195-74-136.....	S74DC-74-135
30195-74-140.....	S74DC-74-140
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30195-74-161.....	S74DC-74-161
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30205-74-156.....	S74DC-74-156 CM4
30208-85-235.....	S85DC-66-235
30208-85-250.....	S85DC-66-250
30208-85-265.....	S85DC-66-265
30231-53-104.....	S53DC-65-104

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Note: It is the Users Responsibility to Verify if the Replacement Cylinder is Interchangeable.

Note: In some applications, modifications may be required for proper cylinder installation.



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30231-53-108	S53DC-65-107
30231-53-123	S53DC-65-120
30238-63-138	S63DC-102-138
30238-63-162	S63DC-102-162
30251-63-120	S63DC-102-120
30251-63-126	S63DC-102-126
30251-63-138	S63DC-102-138
30251-63-162	S63DC-102-162
30252-53-105	S53DC-68-105
30252-53-120	S53DC-68-120
30252-53-123	S53DC-68-123
30252-53-126	S53DC-68-123
30252-53-135	S53DC-65-130 CM2
30252-53-81	S53DC-66-84
30252-53-87	S53DC-66-84
30252-53-99	S53DC-68-99
30278-915-190	S95DC-52-190 CM42
30278-915-220	S95DC-52-220 CM42
30278-915-235	S95DC-52-235 CM42
30278-915-250	S95DC-52-250 CM42
30278-915-265	S95DC-52-265 CM42
30279-53-72	S53DC-66-72
30279-53-84	S53DC-66-84
30279-53-90	S53DC-66-84
30305-84-137	S84DC-66-140
30305-84-156	S84DC-66-156
30305-84-160	S84DC-66-156
30305-85-160	S85DC-66-160
30305-85-190	S85DC-66-190
30305-85-220	S85DC-66-220
30320-915-280	S95DC-52-280
30320-915-300	S95DC-52-300
30324-85-285	S85DC-66-285
30337-85-190T	S85MC-48-200
30337-85-200T	S85MC-48-200
30337-85-204T	S85MC-48-200
30337-85-220T	S85MC-48-220
30337-85-225T	S85MC-48-220
30337-85-235T	S85MC-48-235
30338-915-190	S95DC-52-190
30338-915-220	S95DC-52-220
30338-915-235	S95DC-52-235
30338-915-250	S95DC-52-250
30338-915-265	S95DC-52-265 CM4
30346-915-190	S95DC-52-190
30346-915-220	S95DC-52-220
30346-915-235	S95DC-52-235
30346-915-250	S95DC-52-250
30346-915-265	S95DC-52-265
30347-63-104	S63DC-101-104
30347-63-108	S63DC-101-107
30347-63-111	S63DC-97-111
30347-63-120	S63DC-101-120
30347-63-126	S63DC-101-126
30347-63-129	S63DC-96-130
30347-63-130	S63DC-96-130
30347-63-132	S63DC-96-130
30347-63-136	S63DC-96-130
30347-63-138	S63DC-101-140
30347-63-140	S63DC-101-140
30347-63-77	S63DC-101-77
30347-63-84	S63DC-101-86
30347-63-90	S63DC-101-86
30347-63-96	S63DC-101-92
30347-64-156	S64DC-14-156
30357-63-75	S63DC-101-77 CM36
30369-823-213	S85DC-66-235 CM2
30384-53-135	S53DC-65-130 CM2
30387-74-135	S74DC-74-135
30387-74-140	S74DC-74-140
30426-73-120	S73DC-66-120
30426-73-140	S73DC-66-140
30426-73-150	S73DC-66-150
30426-74-120	S74DC-74-120
30426-74-136	S74DC-74-135
30426-74-156	S74DC-74-156
30426-74-161	S74DC-74-161
30433-85-285	S85DC-66-285

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30434-915-285	S95DC-52-280
30441-916-285	S96DC-2-285
30449-63-105	S63DC-101-107
30449-63-123	S63DC-97-123
30470-64-132	S64DB-12-135
30470-64-135	S64DB-12-135
30493-73-125.25	S73DC-60-125
30494-73-14212	S73DC-60-142
30495-63-09169	S63DC-60-92
30496-53-89	S53MB-5-90
30498-53-81	S53DC-60-81
30499-63-10763	S63DC-60-106
30500-63-126	S63DC-60-125
30504-74-164	S74DC-60-165.75
30505-63-79.63	S63DC-60-79.12
30506-84-162	S84DC-66-161
30521-74-136	S74DC-77-135 CM8
30534-73-120	S73DC-66-120
30534-74-135	S74DC-74-135
30534-74-156	S74DC-74-156
30537-73-142	S73DC-60-142
30541-815-265	S85DC-66-265
30541-85-235	S85DC-66-235
30541-85-240	S85DC-66-235
30541-85-265	S85DC-66-265
30543-63-92	S63DC-60-92
30564-42-67.5	S52DB-9-67.50
30584-63-78	S63DC-101-77 CM71
30592-84-168	S84DC-66-161
30595-74-154	S74MB-3-154
30595-74-172	S74MB-3-172
30602-85-186	S85DC-66-190
30602-85-216	S85DC-66-220
30603-825-186	S85DC-66-190
30603-825-216	S85DC-66-220
30614-73-12525	S73DC-60-125
30616-73-142	S73DC-60-142
30620-63-126	S63DC-60-125
30621-84-162	S84DC-66-161
30779-64-157	S64DC-15-157
40026-85-220	SD85MC-16-220
40041-85-220	SD85MC-16-220
40133-42-55	S52CC-41-54.62
4436-LM	D35LD-7-16
50044-64-145	SD64DC-5-145
50044-64-146	SD64DC-5-145
50138-53-182	SD53CC-51-182
60025-935-220	S95DC-52-220 CM42
60251-63-120	S63DC-102-120
60251-63-126	S63DC-102-126
60251-63-138	S63DC-102-138
60251-63-162	S63DC-102-162
60803-53-156	SD53CC-36-155
6260-BA	D60CD-5-34
6262-BA	D50CB-8-27
6390-BA	D60CD-12-42.62
6402	D50CB-8-27
6403	D60CD-5-34
70000-814-132	S84DC-66-140
70000-814-140	S84DC-66-140
70000-814-147	S84DC-66-148
70000-814-155	S84DC-66-156
70000-814-170	S84DC-66-170
70000-814-172	S84DC-66-180
70000-814-191	S84DC-66-188
70000-815-160	S85DC-66-160
70000-815-170	S85DC-66-170
70000-815-180	S85DC-66-190
70000-815-191	S85DC-66-197
70000-815-210	S85DC-66-220
70000-815-235	S85DC-66-235
70000-815-250	S85DC-66-250
70000-815-265	S85DC-66-265
70001-815-235	S85DC-66-235
70001-815-265	S85DC-66-265
70009-814-173.50	S84DC-66-180 CM21
70016-73-120	S73DC-66-120 CM4
70016-73-130	S73DC-66-129 CM4

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70016-73-140	S73DC-66-140 CM4
70016-74-120	S74DC-74-120 CM4
70016-74-135	S74DC-74-135 CM4
70016-74-140	S74DC-74-140 CM4
70016-74-156	S74DC-74-156 CM4
70016-74-167	S74DC-74-161 CM4
70016-74-180	S74DC-74-180
70018-74-118	S74DC-74-120
70018-74-138	S74DC-74-140
70020-815-190T	S85MC-48-200
70020-815-210T	S85MC-48-220
70021-63-108	S63DC-101-107 CM36
70021-63-120	S63DC-101-120 CM36
70021-63-132	S63DC-96-130 CM36
70021-63-75	S63DC-101-77 CM36
70021-63-84	S63DC-101-86 CM36
70022-814-172	S84DC-66-180
70022-815-210	S85DC-66-220 CM2
70022-815-235	S85DC-66-235 CM2
70022-815-250	S85DC-66-250 CM2
70022-815-265	S85DC-66-265 CM2
70023-815-170	S85DC-66-170
70025-935-200	S95DC-52-190 CM42
70025-935-220	S95DC-52-220 CM42
70025-935-235	S95DC-52-235 CM42
70025-935-250	S95DC-52-250 CM42
70025-935-265	S95DC-52-265 CM42
70025-935-320	S95DC-52-320 CM42
70029-815-270	S85DC-66-265 CM2
70048-74-135	S74DC-77-135
70049-42-82T	S42MB-3-90
70049-42-90T	S42MB-3-90
70050-63-108T	S63MB-11-108
70050-63-111T	S63MB-11-108
70050-63-120T	S63MB-9-120
70050-63-140T	S63MB-8-140
70050-63-150T	S63MB-8-150
70050-63-160T	S63MB-8-160
70050-63-98T	S63MB-11-108
70050-64-140T	S64MB-4-140
70057-53-72	S53DC-66-72
70057-53-84	S53DC-66-84
70057-53-90	S53DC-66-84
70058-74-154T	S74MB-3-154
70058-74-172T	S74MB-3-172
70060-815-220T	S85MC-48-220
70060-815-235T	S85MC-48-235
70060-815-250T	S85MC-48-250
70060-815-265T	S85MC-48-265
70060-815-280T	S85MC-48-280
70060-815-285T	S85MC-48-280
70061-63-98	S63DC-101-104 CM36
70064-74-140H	S74DC-74-140 CM4
70064-74-156H	S74DC-74-156 CM4
70072-53-120T	S53MB-3-120
70125-935-250	S95DC-52-250
70125-935-265	S95DC-52-265
70125-935-280	S95DC-52-280 CM4
70129-63-108T	S63MB-11-108
70129-63-150T	S63MB-8-150
70175-73-129H	S73DC-66-129 CM4
70195-73-108	S73DC-66-110
70195-73-110	S73DC-66-110
70195-73-120	S73DC-66-120
70195-73-124	S73DC-66-124
70195-73-130	S73DC-66-129
70195-73-140	S73DC-66-140
70195-74-135	S74DC-74-135
70195-74-140	S74DC-74-140
70195-74-156	S74DC-74-156
70195-74-161	S74DC-74-161
70195-74-167	S74DC-74-167
70195-74-180	S74DC-74-180
70251-63-120	S63DC-102-120
70251-63-126	S63DC-102-126
70251-63-138	S63DC-102-138
70251-63-162	S63DC-102-162
70252-53-105	S53DC-68-105

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Quick Reference Guide

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70252-53-120	S53DC-68-120
70252-53-123	S53DC-68-123
70252-53-126	S53DC-68-123
70252-53-99	S53DC-68-99
70320-915-300	S95DC-52-300
70320-935-220	S95DC-52-220
70320-935-280	S95DC-52-280
70337-815-200T	S85MC-48-200
70337-815-220T	S85MC-48-220
70338-935-220	S95DC-52-220
70338-935-235	S95DC-52-235
70338-935-250	S95DC-52-250 CM4
70346-935-220	S95DC-52-220
70346-935-235	S95DC-52-235
70346-935-250	S95DC-52-250
70346-935-265	S95DC-52-265
70347-63-104	S63DC-101-104
70347-63-108	S63DC-101-107
70347-63-111	S63DC-97-111
70347-63-120	S63DC-101-120
70347-63-123	S63DC-97-123
70347-63-126	S63DC-101-126
70347-63-130	S63DC-96-130
70347-63-132	S63DC-96-130
70347-63-140	S63DC-101-140
70347-63-77	S63DC-101-77
70347-63-84	S63DC-101-86
70347-63-88	S63DC-101-86
70347-63-96	S63DC-101-92
70347-64-156	S64DC-14-156
70387-74-135	S74DC-74-135
70387-74-140	S74DC-74-140
70387-74-156	S74DC-74-156
70426-73-150	S73DC-66-150
70433-815-285	S85DC-66-285
70434-935-285	S95DC-52-280
70449-63-123	S63DC-97-123
70470-64-132	S64DB-12-135
70470-64-135	S64DB-12-135
70470-64-156	S64DB-12-156
70493-73-124.25	S73DC-60-125
70494-73-142.12	S73DC-60-142
70495-73-125	S73DC-60-125
70498-53-81	S53DC-60-81
70500-63-107	S63DC-60-106
70504-74-162	S74DC-60-165.75
70521-74-136	S74DC-77-135 CM8
70534-74-156	S74DC-74-156
70541-815-210	S85DC-66-220
70541-815-240	S85DC-66-235
70541-815-265	S85DC-66-265
70564-42-67.5	S52DB-9-67.50
70595-74-154T	S74MB-3-154
70595-74-172T	S74MB-3-172
70603-815-180	S85DC-66-190 CM2
70603-815-210	S85DC-66-220 CM2
70611-63-120	S63DC-102-120
70611-63-126	S63DC-102-126
70611-63-138	S63DC-102-138
70611-63-162	S63DC-102-162
70614-73-119	S73DC-66-120 CM38
70616-73-136	S73DC-60-142
70620-63-126	S64DC-60-125
70679-53-123	S53DC-68-123
70802-815-180	S85DC-66-190
70803-815-200T	S85MC-48-200
70803-815-220T	S85MC-48-220
70803-815-240T	S85MC-48-235
70805-64-156	S64DB-12-156
70807-63-120	S63DC-102-120
70809-815-235T	S85MC-48-235
70809-815-250T	S85MC-48-250
70817-73-114	S73DC-66-120
70821-63-91.88	S63DC-101-92
70828-53-123	S53DC-65-126
70832-63-80	S63DC-101-77 CM11
70848-53-84	S53DC-66-84
70850-53-107	S53DC-65-107

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70850-53-126	S53DC-65-126
70852-63-140	S63DC-101-140
70853-64-140T	S64MB-4-140
70854-64-156	S64DB-12-156
70876-73-146.50	S73DC-66-150
70897-74-140	S74DC-74-140 CM4
7200-LM	D35LD-7-16
8159-BA	D40CD-13-37
8174-BA	D30CC-27-27.50
8201-BA	D40CC-27-19
8208-BA	D30CC-13-21.62
8218-BA	D30CA-2-3.62
8221-BA	D30CC-18-8.00
8224-BA	D17AE-2-71.88
8241-BA	D30CC-18-8.00
8259-BA	D50CC-25-43
8260-BA	D17AE-2-71.88
8261-BA	D30CE-11-18.50
8262-BA	D30CC-18-8.00
8263-BA	D30CC-19-16.00
8533-BA	D40DB-7-28.5
8540-BA	D40CB-10-42
8555-BA	D30LD-8-33.38
8560-BA	D45CD-5-49.12
8565-BA	D40CB-10-42
8575-BA	D40DB-7-28.5
8576-BA	D60DC-12-42.62
8596-BA	D60DC-12-42.62
8597-BA	D40DB-7-28.5
8611-BA	D55CC-12-49.12
8644-BA	D45CD-5-49.12
8671-BA	D40DB-7-28.5
8672-BA	D60DC-12-42.62
9021-BA	D30CC-20-8.00
9066A-825-7654-220	S85DC-66-220 CM46
9066A-825-7654-250	S85DC-66-250 CM46
9066A-87654-202	S85DC-66-197 CM46
9066A-87654-220	S85DC-66-220 CM46
9066A-87654-235	S85DC-66-235 CM46
9066A-87654-250	S85DC-66-250 CM46
9185-6543-140	S64MB-4-140
9185-BA	D50CC-25-43
9189-BA	D17AE-2-71.88
9313-987654-199	SD96CC-3-199
9329-987654-198	SD96CC-3-199
9358-65-114	SD62CB-12-114
9406-8765-178	SD84CC-20-178
9467-654-120	SD63DB-14-120
9530-6543-132	SD64CC-7-132
9530-6543-152	SD64CC-7-152
CE700	D60DB-23-72
RCA-55024-06300	D55CC-6-63

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024-0600-1	D60DB-23-72
028-0500-0	D70LN-5-80
098-2010-0	S84DC-66-148
098-2011-0	S84DC-66-180
098-2012-0	S84DC-66-148
098-2013-0	S84DC-66-180
098-3012-0	S85DC-66-190
098-3013-0	S85DC-66-220
098-3014-0	S85DC-66-235
098-3015-0	S85DC-66-250
098-3016-0	S85DC-66-265
098-3028-0	S85DC-66-190
098-3029-0	S85DC-66-220
098-3030-0	S85DC-66-235
098-3031-0	S85DC-66-250
098-3032-0	S85DC-66-265
099-3004-1	S95DC-52-320 CM42
099-3009-0	S95DC-52-250 CM42
099-3010-0	S95DC-52-190 CM42
099-3011-0	S95DC-52-235 CM42
099-3012-0	S95DC-52-265 CM42
099-3024-0	S95DC-52-190 CM42
099-3025-0	S95DC-52-235 CM42
099-3026-0	S95DC-52-250 CM42

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099-3027-0	S95DC-52-265 CM42
099-3030-0	S95DC-52-320 CM42
193-A	S95DC-52-265 CM42
194-A	S95DC-52-235 CM42
195-A	S95DC-52-190 CM42
196-A	S95DC-52-250 CM42
500-A	S85DC-66-190
500-B	S85DC-66-190
501-A	S85DC-66-220
501-B	S85DC-66-220
502-A	S85DC-66-235
502-B	S85DC-66-235
503-A	S85DC-66-250
503-B	S85DC-66-250
504-A	S85DC-66-265
504-B	S85DC-66-265
519-A	S84DC-66-148
519-B	S84DC-66-148
519-H	S84DC-66-148
520-A	S84DC-66-180
520-B	S84DC-66-180
520-H	S84DC-66-180
DA168.37-53-OB76 1/2	SD53CD-3-168
SA120-5-3-TB-53.75-14.37	S53MB-3-120
SA148.5-8.12-4-BC-54	S84DC-66-148
SA148.5-8-4-BC-54	S84DC-66-148
SA149-8-4-BC-54	S84DC-66-148
SA172.5-8.12-4-BC-60	S84DC-66-180
SA172.5-8-4-BC-60	S84DC-66-180
SA173-8-4-BC-60	S84DC-66-180
SA186-8-5-BC-54	S85DC-66-190
SA190-8-5-BC-54	S85DC-66-190
SA196-912-5-BC-58	S95DC-52-190 CM42
SA216-8-5-BC-60	S85DC-66-220
SA220-8-5-BC-60	S85DC-66-220
SA235-8-5-BC-65	S85DC-66-235
SA235-912-5-BC-66	S95DC-52-235 CM42
SA250-8-5-BC-68	S85DC-66-250
SA250-912-5-BC-69	S95DC-52-250 CM42
SA265-8-5-BC-71	S85DC-66-265
SA265-912-5-BC-72	S95DC-52-265 CM42
SA320-912-5-BC-83	S95DC-52-320 CM42

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71564118	S63DC-101-107
71564138	S63DC-101-120
71564188	S63DC-101-140
71564238	S64DC-14-156
71565178	S74DC-74-135
71565208	S74DC-74-140
71565238	S74DC-74-156
71565268	S74DC-74-167
71565298	S74DC-74-180
71566238	S84DC-66-156
71566268	S84DC-66-170
71566298	S84DC-66-180
71567418	S85DC-66-197
71567458	S85DC-66-220
71567498	S85DC-66-235
71567538	S85DC-66-235
71567558	S85DC-66-250
71567588	S85DC-66-265
71568458	S95DC-52-220
71568498	S95DC-52-235
71568538	S95DC-52-250
71568558	S95DC-52-265
71568728	S95DC-52-320
FEE129302755231AK1304	S63DC-101-107
FEE129-3-02980	S63DC-101-120
FEE129302980231AK1379	S63DC-101-120
FEE129303460231AK539	S63DC-101-140
FEE129-3-2980	S63DC-101-120
FEE129-3-3460	S63DC-101-140
FEE129-4-3980	S64DC-14-156
FEE149-4-3380	S74DC-74-135
FEE149-4-3680	S74DC-74-140
FEE149-4-3980	S74DC-74-156
FEE149-4-4280	S74DC-74-167

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FEE149-4-4620	S74DC-74-180
FEE169-4-3980	S84DC-66-156
FEE169-4-4280	S84DC-66-170
FEE169-4-4680	S84DC-66-180
FEE191-5-5355	S85DC-66-197
FEE191-5-5780	S85DC-66-220
FEE191-5-6180	S85DC-66-235
FEE191-5-6480	S85DC-66-235
FEE191-5-6830	S85DC-66-250
FEE191-5-7130	S85DC-66-265
FEE214-5-5780	S95DC-52-220
FEE214-5-6180	S95DC-52-235
FEE214-5-6480	S95DC-52-250
FEE214-5-6830	S95DC-52-265
FEE214-5-8130	S95DC-52-320
FEE6-3-108	S63DC-101-107
FEE6-3-117	S63DC-101-120
FEE6-3-136	S63DC-101-140
FEE8-5-235	S85DC-66-235
FEF6-4-157	S64DC-14-156
FEF7-4-133	S74DC-74-135
FEF7-4-145	S74DC-74-140
FEF7-4-157	S74DC-74-156
FEF7-4-169	S74DC-74-167
FEF7-4-182	S74DC-74-180
FEF8-4-157	S84DC-66-156
FEF8-4-169	S84DC-66-170
FEF8-4-182	S84DC-66-180
FEF8-5-211	S85DC-66-197
FEF8-5-228	S85DC-66-220
FEF8-5-243	S85DC-66-235
FEF8-5-255	S85DC-66-235
FEF8-5-269	S85DC-66-250
FEF8-5-281	S85DC-66-265
FEF9-5-228	S95DC-52-220
FEF9-5-243	S95DC-52-235
FEF9-5-255	S95DC-52-250
FEF9-5-269	S95DC-52-265
FEF9-5-320	S95DC-52-320

J Craft

001679	S63DC-97-123
001682	S63DC-97-111
001683	S73DC-66-129
001684	S74DC-74-156
001685	S85DC-66-190

Johnson

D3-38	S63DC-101-77 CM26
D3-48	S63DC-101-107 CM26
D3-50	S63DC-97-111 CM26
D3-52	S63DC-101-120 CM26
D3-55	S63DC-97-123 CM26
D3-60	S63DC-101-140 CM26
D3-63	S63DC-101-150 CM26
E4-45	S74DC-74-120 CM23
E4-48	S74DC-74-135 CM23
F3-58	S84DC-66-140 CM66
F3-60	S83DC-56-139 CM66
F3-67	S84DC-66-170 CM66
F4-51	S84DC-66-148 CM22
F4-55	S84DC-66-161 CM22
F4-57	S84DC-66-170 CM22
F4-62	S84DC-66-188 CM22
F5-55	S85DC-66-197 CM1
F5-59	S85DC-66-220 CM1
FMD3-38	S63DC-101-77 CM26
FMD3-48	S63DC-101-107 CM26
FMD3-50	S63DC-97-111 CM26
FMD3-52	S63DC-101-120 CM26
FMD3-55	S63DC-97-123 CM26
FMD3-60	S63DC-101-140 CM26
FMD3-63	S63DC-101-150 CM26
FME4-45	S74DC-74-120 CM23
FME4-48	S74DC-74-135 CM23
FMF3-58	S84DC-66-140 CM66
FMF3-60	S83DC-56-139 CM66
FMF3-67	S84DC-66-170 CM66

Johnson

FMF4-51	S84DC-66-148 CM22
FMF4-55	S84DC-66-161 CM22
FMF4-57	S84DC-66-170 CM22
FMF4-62	S84DC-66-188 CM22
FMF5-55	S85DC-66-197 CM1
FMF5-59	S85DC-66-220 CM1
FMG5-55	S95DC-52-190 CM22
FMG5-57	S95DC-52-190 CM22
FMG5-60	S95DC-52-220 CM22
FMG5-62	S95DC-52-220 CM22
FMG5-65	S95DC-52-235 CM22
FMG5-67	S95DC-52-250 CM22
FMG5-69	S95DC-52-250 CM22
FMG5-72	S95DC-52-265 CM22
G5-55	S95DC-52-190 CM22
G5-57	S95DC-52-190 CM22
G5-60	S95DC-52-220 CM22
G5-62	S95DC-52-220 CM22
G5-65	S95DC-52-235 CM22
G5-67	S95DC-52-250 CM22
G5-69	S95DC-52-250 CM22
G5-72	S95DC-52-265 CM22

Kalyn / Siebert

2533038	S85DC-66-197
2533039	S85DC-66-220
2533040	S85DC-66-235
2533047	S95DC-52-280
2533067	S85DC-66-285

Kann Mfg

1400101	D30CD-13-28
1400106	D65CC-9-66
1400121	D40MD-1-72
1400121ABA	D40MD-1-72
1400128	D30LD-10-36
1400135	D35CC-28-38
1400175	D45DD-8-16.75

K-Pac / Krause Corp

21-141	D70LN-5-80
Labrie Equipment	
020-9431-20	D50DC-4-40
HYC00510	D50DC-4-40
HYC01550	D32CC-12-15.50
HYC01550	D32CC-12-15.50

Leach

200869	SD7500-1-100
201500	SD8600-1-146
20278	SD7500-1-100
209787	SD64DC-5-145
2R1006A	D60BC-5-30.31 536
2R1008R	D60BC-5-30.31 495
300679	D60BC-5-30.31 495
300900	D60BC-5-30.31 495
300990	D60BC-5-30.31 495
302525	SD63CC-23-167
303407	SD63CC-23-167
303904	D60BC-5-30.31 495
304000	SD63CC-23-167
304168	D60BC-5-30.31
304805	D60BC-5-30.31 536
305688	SD63CC-39-167
305827	D60BC-5-30.31 495
305972	D60CF-3-32.38
306562	D60BC-5-30.31 495
307081	D60BC-5-30.31
307082	D60BC-6-27.81
32046	D60BC-5-30.31 495
400383	D60CF-3-32.38
400753	S41LC-1-39.38
401056	S41LC-1-39.38
402160	S41LC-1-39.38
402324	S41LC-1-39.38
405089	S41LC-1-39.38
405114	S41LC-1-39.38
406368	D60CF-3-32.38

Leach

406369	S41LC-1-39.38
406399	S41LC-1-39.38
406639	S41LC-1-39.38
41354	D60CF-3-32.38
41357	D60CF-3-32.38
601429	S41LC-1-39.38
620509	D60BC-6-27.81
620568	D60BC-5-30.31
700081	D60BC-5-30.31 528
700289	D60BC-6-27.81 528
704045	704045
717488	D60BC-5-30.31 528
718876	SD64DC-5-145
PO1166	D60CF-3-32.38
PO265	S41LC-1-39.38

Lodal

9930251	SD52CC-24-111
9930254	SD42CC-19-111
9930258	SD95CC-3-160
9930272	SD42CC-19-111
9930303	SD42CC-19-111
9930341	SD53CC-36-155
9930361	SD53CC-36-155

Lufkin

ULD-35	S85DC-66-235
13789850 (3789850)	S85DC-66-265

Mabar

T63108	S63DC-101-107
T63120	S63DC-101-120
T63126	S63DC-97-123
T74135	S74DC-74-135
T74140	S74DC-74-140
T74156	S74DC-74-156

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5000011	S85DC-66-190
5000012	S85DC-66-220
5000026	S85DC-66-250
5000058	S95DC-52-250
5000060	S95DC-52-265
5000085	S85DC-66-235
5000134	S95DC-52-235
9000012	S85DC-66-235
9000015	S85DC-66-220
9000016	S95DC-52-265
9000023	S85DC-66-250
9000025	S85DC-66-190
9000029	S95DC-52-250
9000030	S85DC-66-197
9000031	S84DC-66-188
9000034	S74DC-74-135
9000035	S73DC-66-110
9000036	S63DC-97-123
9000037	S63DC-97-111
9000038	S64DC-14-156
9000079	S95DC-52-235
C102-6-3	S63DC-101-104
C111-6-3	S63DC-97-111
C111-7-3	S73DC-66-110
C120-6-3	S63DC-101-120
C123-6-3	S63DC-97-123
C135-7-4	S74DC-74-135
C148-8.125-4	S84DC-66-148
C156-6-4	S64DC-14-156
C156-6-4A	S64DC-14-156
C156-6-4B	S64DC-14-156
C160-7-4	S74DC-74-156
C160-8.125-4	S84DC-66-156
C162-7-4	S74DC-74-161
C167-7-4	S74DC-74-161
C183-8.125-4	S84DC-66-180
C183-8-4	S84DC-66-188
C190-8.125-5	S85DC-66-190
C190-8-5	S85DC-66-190
C190-9.375-5	S95DC-52-190

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C200-8-5.....	S85DC-66-197
C220-8.125-5.....	S85DC-66-220
C220-8-5.....	S85DC-66-220
C220-9.375-5.....	S95DC-52-220
C235-8.125-5.....	S85DC-66-235
C235-8-5.....	S85DC-66-235
C235-9.25-5.....	S95DC-52-235
C235-9.375-5.....	S95DC-52-235
C250-8.125-5.....	S85DC-66-250
C250-8-5.....	S85DC-66-250
C250-9.25-5.....	S95DC-52-250
C250-9.375-5.....	S95DC-52-250
C265-8.125-5.....	S85DC-66-265
C265-9.25-5.....	S95DC-52-265
C265-9.375-5.....	S95DC-52-265
C280-9.375-5.....	S95DC-52-280
C300-9.375-5.....	S95DC-52-300
CS132-5.5-3DA.....	SD63CB-26-132.75
CS156.88-5.5-3 DA.....	SD53CD-3-156.88
CS164-5.5-3DA.....	SD63CC-44-164
CS166.25-6.5-3 DA.....	SD63CC-39-167
CS1662.5-6.5-3DA.....	SD63CC-39-167
CS167-6-1/2.3 DA.....	SD63CB-26-167
CS167-6-1/2-3DA.....	SD63CB-27-167
CS181-5.5-3DA.....	SD63CC-44-181
CS197-6.5-3DA.....	SD63CB-26-197
P12040TC5419.....	D40CB-10-42
P12055SS5426.....	D55CC-6-63
PC0601113HG0037.....	S63DC-97-111
PC0601233HG0036.....	S63DC-97-123
PC0601564HG0038.....	S64DC-14-156
PC0701113HG0035.....	S73DC-66-110
PC0701354HG0034.....	S74DC-74-135
PC0701624HG0033.....	S74DC-74-161
PC0701784HG0261.....	S74DC-74-180
PC0801834HG0031.....	S84DC-66-188
PC0801905HG0025.....	S85DC-66-190
PC0802005HG0030.....	S85DC-66-197
PC0802205HG0015.....	S85DC-66-220
PC0802355HG0012.....	S85DC-66-235
PC0802505HG0023.....	S85DC-66-250
PC0802705HG00230.....	S85DC-66-265
PC0922355HG0047.....	S95DC-52-235
PC0922505HG0029.....	S95DC-52-250
PC0922655HG0016.....	S95DC-52-265
PCD0551573BC0629.....	SD53CD-3-156.88
PI2050555455.....	D50CC-24-34.19
PS0601023HG0033.....	C102-6-3
PS0601113HG0045.....	S63DC-97-111
PS0601203HG0052.....	S63DC-101-120
PS0601564HG0041.....	S64DC-14-156
PS0601564HG0043.....	S64DC-14-156
PS0701354HG0012.....	S74DC-74-135
PS0701604HG0044.....	S74DC-74-156
PS0701674HG0081.....	S74DC-74-161
PS0811484HG0009.....	S84DC-66-148
PS0811604HG0010.....	S84DC-66-156
PS0811834HG0011.....	S84DC-66-180
PS0811905HG0001.....	S85DC-66-190
PS0812205HG0003.....	S85DC-66-220
PS0812355HG0004.....	S85DC-66-235
PS0812655HG0006.....	S85DC-66-265
PS0912505HG0005.....	S85DC-66-250
PS0931905HG0020.....	S95DC-52-190
PS0932205HG0008.....	S95DC-52-220
PS0932355HG0022.....	S95DC-52-235
PS0932505HG0023.....	S95DC-52-250
PS093265HG0024.....	S95DC-52-265
PS0932805HG0024.....	S95DC-52-280
PS0933005HG0026.....	S95DC-52-300
PSD0551323HC0326.....	SD63CB-26-132.75
PSD0551573BC0362.....	SD53CD-3-156.88
PSD0551643SS0317.....	SD63CC-44-164
PSD0551683BC0360.....	SD53CD-3-168
PSD0551743BC0365.....	SD53CD-3-156.88
PSD0551813SS0306.....	SD63CC-44-181
PSD0551863BC0361.....	SD53CD-3-185.75
PSD0651663SC0243.....	SD63CC-39-167

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PSD0651973TC0295.....	SD63CB-26-197
PSD0651673SS0294.....	SD63CB-27-167
PSD0651673TC0293.....	SD63CB-26-167
SM1-22-4.42.....	D40CB-10-42
SM1-22-42.75.....	D50CC-25-43
SM1-22-5-43.25.....	D50CC-25-43
SM2-22-4.5-52.75.....	D45DD-10-52.75
SM6-22-5-345.....	D50CC-24-34.19
SM6-22-3-16.....	D30CC-19-16.00
SM6-22-3-18.5.....	D30CE-11-18.50
SM6-22-3-8.....	D30CC-20-8.00
SM6-22-4.5-41.5.....	D45CC-19-41.50
SM6-22-5-5-63.....	D55CC-6-63

Marathon

04-0127.....	D70DD-7-79
04-2000.....	D60DB-23-72
04-2001.....	SD63CB-23-118
04-2003.....	D70LN-5-90

Marion Farnsworth

3243C.....	S32DB-3-42.62 CM72
3250-C.....	S32DB-3-50 CM72
4243C.....	S32DB-8-43 CM72
4250C.....	S42DB-8-51 CM72
4260T.....	M42MB-60
4375C.....	S43DB-3-75 CM72
5360C.....	S53DB-13-60
5390C.....	S53DB-18-90
5390T.....	S53MB-5-90
A218630-119.....	S74DC-74-120 CM26
A218630-135.....	S74DC-74-135 CM26
M32DB-43.....	S32DB-3-42.62 CM72
M32DB-50.....	S32DB-3-50 CM72
M32DB-50-0X.....	S32DB-3-50
M42DB-43.....	S42DB-8-43 CM72
M42DB-43-P.....	M42DB-43-P
M42DB-50.....	S42DB-8-51 CM72
M42DB-50S.....	S42DB-8-51
M42MB-60.....	M42MB-60
M42MB-60-S.....	S42MB-5-60
M43DB-75.....	S43DB-3-75 CM72
M43DB-75S.....	S43DB-3-75
M52CB-43-P.....	M52CB-43-P
M53DB-60.....	S53DB-13-60
M53DB-90.....	S53DB-18-90
M53MB-90.....	S53MB-5-90
M53MB-90-PG.....	S53MB-5-90

Maxon

401826.....	D35LD-7-16
D2604.....	D35LD-7-16

McClain

1001160.....	S85DC-66-250
1001163.....	S85DC-66-235
1002190.....	D62LB-5-80
1002191.....	D72LB-9-80
HCL85X235.....	S85DC-66-235
HCL85X250.....	S85DC-66-250
HCL96X480.....	SD96MC-5-480

McClain Ez Pack

20-04001.....	3782000014
20-41381.....	D40CB-10-42
20-43726.....	D40DB-7-28.5
20-43727.....	D40DB-7-28.5
20-44095.....	D60DC-12-42.62
20-44969.....	D40DB-7-28.5
20-44973.....	D60DC-12-42.62
20-46076.....	D40DB-7-28.5
20-46077.....	D60DC-12-42.62
20-46119.....	D45CD-5-49.12
20-46159.....	D40CB-10-42
20-46163.....	D45CD-5-49.12
20-46171.....	D45CD-5-49.12
20-46372.....	D40DB-7-28.5
20-47048.....	D30LD-8-33.38

McClain Ez Pack

20-47088.....	D40CB-10-42
20-47091.....	D40DB-7-28.5
20-47092.....	D60DC-12-42.62
20-48279.....	D60DC-12-42.62
20-48280.....	D40DB-7-28.5
20-48519.....	D55CC-12-49.12
20-49273.....	D45CD-5-49.12
20-49277.....	D45CD-5-49.12
20-49897.....	D40DB-7-28.5
20-49898.....	D60DC-12-42.62
20-52344.....	D45CD-5-49.12
20-52347.....	D30LD-8-33.38
20-52355.....	D55CC-12-49.12
21-01530.....	D60DC-12-42.62
21-01531.....	D40DB-7-28.5
21-01987.....	SD63CB-26-197
21-02220.....	D40DB-7-25.62
21-02610.....	D40DB-7-25.62
21-02832.....	D40CB-10-42
21-03153.....	D40LD-10-24.75
21-03854.....	SD52CB-6-132.75
21-04536.....	SD63CB-26-132.75
21-04537.....	SD63CB-26-167
21-04538.....	SD63CB-26-197
21-05358.....	D45CD-4-49.12
21-06096.....	SD63CB-27-167
21-09228.....	D40LD-11-24.75
21-12851.....	D55CC-12-49.12
21-14658.....	D40DB-7-28.5
21-14659.....	D60DC-12-42.62
21-14661.....	D40DB-7-25.62
21-15639.....	D55CC-12-49.12
21-15641.....	D45CD-4-49.12
21-15642.....	D40LD-11-24.75
21-15644.....	D30LD-8-33.38
21-15770.....	SD63CB-26-167
21-15771.....	SD63CB-27-167
21-15772.....	SD63CB-26-197
21-15773.....	SD63CB-26-132.75
21-16048.....	SD52CB-6-132.75
4028BDA.....	D40DB-7-28.5
4028CDA.....	D40DB-7-28.5
4028DA.....	D40DB-7-28.5
4549DA.....	D45CD-5-49.12
6042ADA.....	D60DC-12-42.62
6042DA.....	D60DC-12-42.62
70-1251.....	SD85CC-19-378
70-1510.....	SD85CC-19-378
70-1549.....	SD85CC-19-378
70-1592.....	SD63CB-26-167
70-1601.....	SD63CB-26-132.75
70-1619.....	SD63CB-26-167
70-1627.....	SD63CB-26-132.75
70-1632.....	SD85CC-19-378
70-1730.....	SD63CB-26-167
70-1731.....	SD63CB-26-132.75
85378DA.....	SD85CC-19-378
C3033EDA.....	D30LD-8-33.38
C4025NDA.....	D40DB-7-25.62
C4025RDA.....	D40LD-11-24.75
C4028MDA.....	D40DB-7-28.5
C4549NDA.....	D45CD-4-49.12
C52133CDA.....	SD52CB-6-132.75
C5549CDA.....	D55CC-12-49.12
C6042MDA.....	D60DC-12-42.62
C63133ADA.....	SD63CB-26-132.75
C63133EDA.....	SD63CB-26-132.75
C63167BDA.....	SD63CB-26-167
C63167HDA.....	SD63CB-26-167
C63167JDA.....	SD63CB-27-167
C63198DDA.....	SD63CB-26-197
C85378DDA.....	SD85CC-19-378
D3033ADA.....	D30LD-8-33.38
D4028DDA.....	D40DB-7-28.5
D4028EDA.....	D40DB-7-28.5
D4028FDA.....	D40DB-7-28.5
D4028GDA.....	D40DB-7-28.5
D4028KDA.....	D40DB-7-28.5

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McClain Ez Pack

D4042BDA	D40CB-10-42
D4042CDA	D40CB-10-42
D4549ADA	D45CD-5-49.12
D4549BDA	D45CD-5-49.12
D4549DDA	D45CD-5-49.12
D4549EDA	D45CD-5-49.12
D5549DA	D55CC-12-49.12
D6042BDA	D60DC-12-42.62
D6042CDA	D60DC-12-42.62
D6042DDA	D60DC-12-42.62
D6042HDA	D60DC-12-42.62
D63133DA	SD63CB-26-132.75
D63167DA	SD63CB-26-167
D85378BDA	SD85CC-19-378
D85378CDA	SD85CC-19-378
J4549FDA	D45CD-5-49.12
K3033DDA	D30LD-8-33.38
K4025GDA	D40DB-7-25.62
K4025JDA	D40LD-10-24.75
K4025KDA	D40LD-11-24.75
K4028LDA	D40DB-7-28.5
K4042DDA	D40CB-10-42
K4549LDA	D45CD-5-49.12
K4549MDA	D45CD-4-49.12
K52133DA	SD52CB-6-132.75
K5549ADA	D55CC-12-49.12
K5549BDA	D55CC-12-49.12
K6042LDA	D60DC-12-42.62
K63133CDA	SD63CB-26-132.75
K63133DDA	SD63CB-26-132.75
K63167DDA	SD63CB-26-167
K63167FDA	SD63CB-26-167
K63167GDA	SD63CB-27-167
K63198ADA	SD63CB-26-197
K63198BDA	SD63CB-26-197

McNeilus (MTM)

0126256	D45DD-10-52.75
0604124	SD53CC-48-164
0604126	D60DC-13-65.75
0604134	D50DD-29-25.62
0604135	D55DD-14-38.62
0604136	S31CB-2-42
0604137	SD74DC-7-119
0604145	D45DD-9-23
0604146	D50DD-30-32.50
0604976	D50DD-32-37.25
0606971	SD63DC-CP493-46
0614333	D35CC-27-26
0614366	D45CC-20-46
0614371	D20DD-8-95
0619882	D32LL-11-38
0619891	D45CC-20-46
0626003	SD85MC-15-220
0635876	D50DD-28-39.50
0651550	D62LB-5-80
0660778	D20DD-8-95
0661950	SD63CC-44-164
0661951	SD63CC-44-181
1000067	D32LL-11-38
1000068	D35CC-27-26
1000069	D45CC-20-46
1000077	D20DD-8-95
1000081	SD53CC-48-164
1000094	D50DD-28-39.50
1000160	D20DD-8-95
1100031	D45DD-10-52.75
1100038	D60DC-13-65.75
1105524	D30CE-11-18.50
1106845	D40LD-10-24.75
1106846	D45CD-5-49.12
1107471	SD63CB-26-167
1107676	D50CC-25-43
1107976	D50CC-25-43
1107995	D17AE-2-71.88
1107996	D30CC-20-8.00
1108091	D30CC-17-28.19
1108092	D55CC-6-63

McNeilus (MTM)

1108093	D40CD-13-37
1108095	S52DB-9-67.50
1108097	D30CC-19-16.00
1108107	D45CC-19-41.50
1108108	D30CC-18-8.00
1108110	D30CC-19-16.00
1108286	D55DD-14-38.62
1108287	D50DD-29-25.62
1108291	D50DD-30-32.50
1108292	D45DD-9-23
1108293	S31CB-2-42
1108973	D60BC-5-30.31
1109039	SD53CC-51-182
1109094	D17AE-2-71.88
1109095	D30CC-11-18.50
1109096	D30CC-20-8.00
1109097	D30CC-18-8.00
1109279	D30CC-20-8.00
1109305	SD63CC-39-167
1109314	SD64DC-5-145
1109368	D50DD-32-37.25
1109612	S41LC-1-39.38
1109698	D30CA-2-3.62
1109699	D60DB-23-72
1109700	D70LN-5-80
1130000	SD63CC-44-164
1130000R	SD63CC-44-164
1130001	SD63CC-44-181
1130001R	SD63CC-44-181
1130015	D30CC-19-16.00
1130637	D55CC-9-35.88
1130638	D40CD-14-25
1130640	D30CC-13-21.62
1130642	D50CC-25-43
1130728	D17AE-2-71.88
1130729	D30CC-19-16.00
1131210	D40CD-8-22
1131389	D40DB-7-28.5
1131703	D30CC-20-8.00
1131704	D30CE-11-18.50
1131705	D50CC-25-43
1132626	D20DD-6-6.25
1132629	D20DD-6-6.25
1132746	D60CL-2-40
1132757	SD63CB-23-118
1132770	D30CE-11-18.50
1132771	D30CC-20-8.00
1132774	D17AE-2-71.88
1132775	D30CC-19-16.00
1136597	S52CC-41-54.62
1136607	SD53CC-51-151.5
1136614	D30CC-27-27.50
1137327	D40CC-27-19
1137328	S52CC-41-54.62
1137329	D55CC-7-24
1138697	SD63CB-26-197
1139663	D40LD-11-24.75
1139665	D60DC-12-42.62
1139666	D40DB-7-28.5
1140624	SD63CC-44-164
1140624R	SD63CC-44-164
1140625	SD63CC-44-181
1140625R	SD63CC-44-181
1141048	D30CC-20-8.00
1141057	D50CC-25-43
1142328	S52CC-41-54.62
1142458	SD63CC-44-181
1144059	SD63CC-44-164
1144702	D20DD-8-95
1144703	D32LL-11-38
1144704	D35CC-27-26
1144708	D45CC-20-46
1145282	D45DD-10-52.75
1145283	D20DD-6-6.25
1145616	D35DD-7-17.88
1145648	D20DD-6-6.25
1146285	D62LB-5-80
1147920	SD74DC-7-119

McNeilus (MTM)

1148071	SD52DC-CP626-38
1148237	D72LB-9-80
1149090	D25LL-16-24
1149192	D40CD-14-25
1149523	D40CB-10-42
1149552	D35CD-10-20
1149557	D40DD-19-22.50
1149600	D50DC-4-40
1149968	D45CC-19-41.50
1151008	D60DC-13-65.75
1151133	D20DD-6-6.25
1151216	D25LL-15-84
1151217	D25LL-14-42
1151218	D40CL-13-45.38
1151219	D45LD-7-45.38
1151220	D35LD-5-19
1151221	D60DD-20-79
1151222	D70DD-9-79
1151224	D40MD-1-72
1151227	D30LD-10-36
1151228	D65CC-9-66
1151229	D35CC-28-38
1151231	D30CD-13-28
1156041	SD63CB-26-167
1156070	1-6720
1156344	S52CC-41-67.25
1164534	SD53CD-3-156.88
1164535	SD53CD-3-168
1164536	SD53CD-3-185.75
1178457	D32CC-12-15.50
1179422	1179422
1180843	D25LD-2-90
1180847	D30CC-20-8.00
1180858	D45CC-19-41.50
1180859	D40CD-8-22
1180860	D50CC-24-34.19
1180862	D30CC-17-28.19
1180868	D30CC-17-28.19
1180871	D35LD-7-16
1180873	D35CD-11-19
1180875	1-6720
1181025	SD53CC-48-164
1226778	D55CC-12-49.12
1227259	D30LD-8-33.38
1229097	SD64DC-7-133.12
1229475	SD53CC-51-151.5
1229476	D62LB-5-80
1237803	SD63CB-26-132.75
1237805	D40CB-10-42
1237806	D55CC-6-63
1237809	SD63CB-26-167
1237810	SD63CB-27-167
1237811	SD63CB-26-197
1237812	SD63CC-44-181
1254376	SD63CC-44-164
1254377	D50CC-24-34.19
1257605	D40CD-16-29.50
1259507	SD53CD-3-156.88
1263111	SD53CD-3-168
1263244	SD53CD-3-156.88
1263245	SD53CD-3-168
1263246	SD53CD-3-185.75
1273348	D45DD-10-52.75
200.126256	D45DD-10-52.75
200.126256R	D45DD-10-52.75
200.16418R	C3667
2114661	D40DB-7-25.62
643705	D35DD-7-17.88
643706	D20DD-6-6.25
9070.614333	D35CC-27-26
9070.614333R	D35CC-27-26
9070.651550	D62LB-5-80
9070.654695	D62LB-5-80
9070.654697	D72LB-9-80
9072.604134	D50DD-29-25.62
9072.604135	D55DD-14-38.62
9072.604137	SD74DC-7-119
9170.614371	D20DD-8-95

Crossover and Application Data is for Reference Purpose Only. No Other Conditions are Expressed or Implied.

Note: It is the Users Responsibility to Verify if the Replacement Cylinder is Interchangeable.

Note: In some applications, modifications may be required for proper cylinder installation.



Quick Reference Guide

McNeilus (MTM)

9170.660778.....	D20DD-8-95
9172.604147.....	D20DD-8-95
9180.651550.....	D62LB-5-80
9180.654697.....	D72LB-9-80
9270.604124.....	SD53CC-48-164
9270.604124R.....	SD53CC-48-164
9270.604126.....	D60DC-13-65.75
9270.604137.....	SD74DC-7-119
9270.606971.....	SD63DC-CP493-46
9270.635876.....	D50DD-28-39.50
9270.673087.....	SD52DC-CP626-38
9272.604124.....	SD53CC-48-164
9272.604126.....	D60DC-13-65.75
9272.604127.....	D32LL-11-38
9370.604124.....	SD53CC-48-164
9370.604127.....	D32LL-11-38
9370.604136.....	S31CB-2-42
9370.619882.....	D32LL-11-38
9430.661950.....	SD63CC-44-164
9430.661951.....	SD63CC-44-181
9470.604124.....	SD53CC-48-164
9470.604134.....	D50DD-29-25.62
9470.604135.....	D55DD-14-38.62
9470.604145.....	D45DD-9-23
9470.604146.....	D50DD-30-32.50
9470.615860.....	D50DD-28-39.50
9470.630861.....	D50DD-28-39.50
9570.614333.....	D35CC-27-26
9570.614366.....	D45CC-20-46
9570.614380.....	D45CC-20-46
9570.619891.....	D45CC-20-46
9570.643705.....	D35DD-7-17.88
9570.643706.....	D20DD-6-6.25
9572.601047.....	D3837
9830.620509.....	D60BC-6-27.81
9830.620698.....	D60BC-5-30.31 536
9870.620568.....	D60BC-5-30.31
9870.620569.....	D60CD-5-34
9870.620645.....	D50CB-8-27
9870.620695.....	D60BC-5-30.31 495
9870.622401.....	D50CC-27-36
9870.622402.....	D55CC-10-24.25
9870.623499.....	D60CF-3-32.38
9870.623999.....	S41LC-1-39.38
9872.623428.....	SD86OO-1-146
9872.626002.....	SD84MC-18-176
9872.626003.....	SD85MC-15-220
9872.626004.....	SD85MC-16-220
9880.623829.....	SD64CC-7-132
9970.601047.....	D3837
9970.604976.....	D50DD-32-37.25

Pak-Mor

2001103.....	SD84MC-18-152
2001105.....	SD84MC-18-176
2001106.....	SD85MC-15-220
2001111.....	SD85MC-16-220
2001116.....	SD95MC-6-220
2001120.....	SD95MC-6-220
4148037.....	D60CL-2-40

Palmer Machine

8-4-148.....	S84DC-66-148
8-4-152 P.....	S84DC-66-148 CM20
8-4-156.....	S84DC-66-156
8-4-180.....	S84DC-66-180
8-4-188.....	S84DC-66-180 CM20
8-5-172.....	S85DC-66-160 CM18
8-5-190 P.....	S85DC-66-190
8-5-220.....	S85DC-66-220

Parts Place

10DB08042C.....	D50CB-8-27
10DB08042F.....	D50CB-8-27
10DB08043F.....	D60CD-5-34
2021-04536C.....	SD63CB-26-132.75
2021-04537C.....	SD63CB-26-167
40307081H.....	D60BC-5-30.31

Parts Place

40309787H.....	SD64DC-5-145
652001106C.....	SD85MC-15-220
82HH001H.....	D62LB-5-80
82HH002H.....	D72LB-9-80
87H1020.....	D40CD-16-29.50

Peabody Galion

21-04001.....	3782000014
30-00199.....	S63MC-21-108
30-00201.....	S63MC-21-128
3024CDA.....	3782000014
31-00080.....	S63MC-21-80
31-00215.....	S53MB-5-90
5381.....	S53DC-60-81
5389.....	S53MB-5-90
5389B.....	S53MB-5-90
5389E.....	S53MB-5-90
63108.....	S63DC-60-106
63128.....	S63DC-60-125
6380A.....	S63DC-60-79.12
6380G.....	S63DC-60-79.12
6392.....	S63DC-60-92
6392A.....	S63DC-60-92
70-1022.....	S63DC-60-92
70-1023.....	S84DC-66-188
70-1031.....	S53MB-5-90
70-1040.....	S85DC-66-220
70-1049.....	S85DC-66-220
70-1052.....	S85DC-66-220
70-1061.....	S74DC-74-120 CM38
70-1113.....	S53DC-60-81
70-1115.....	S63DC-60-106
70-1116.....	S63DC-60-125
70-1118.....	S73DC-60-125
70-1119.....	S74DC-60-165.75
70-1124.....	S85DC-66-197
70-1125.....	S95DC-52-190
70-1126.....	S95DC-52-220
70-1127.....	S95DC-52-250
70-1262.....	S53MB-5-90
70-1271.....	S73DC-60-142
70-1272.....	S63DC-60-92
70-1328.....	S63DC-60-79.12
70-1431.....	S53MB-5-90
70-1481.....	S53MB-5-90
70-1482.....	S53DC-60-81
70-1483.....	S63DC-60-92
70-1484.....	S63DC-60-106
70-1485.....	S63DC-60-125
70-1486.....	S73DC-60-125
70-1490.....	S63DC-60-79.12
70-1493.....	S73DC-60-142
70-1494.....	S74DC-60-165.75
70-1534.....	S73DC-60-125
70-1554.....	S73DC-60-142
70-1561.....	S63DC-60-92
70-1593.....	S73DC-60-142
70-1603.....	S63DC-60-106
70-1604.....	S63DC-60-125
70-1606.....	S73DC-60-125
70-1608.....	S74DC-60-165.75
70-1611.....	S73DC-60-125
70-1645.....	S73DC-60-125
70-1648.....	S63DC-60-125
70-1649.....	S63DC-60-92
70-1650.....	S63DC-60-106
70-1651.....	S74DC-60-165.75
70-1654.....	S53MB-5-90
70-1658.....	S63DC-60-79.12
70-1669.....	S73DC-60-142
70-1671.....	S53DC-60-81
70-1699.....	S53MB-5-90
70-1735.....	S53DC-60-81
70-1736.....	S63DC-60-79.12
70-1737.....	S63DC-60-106
70-1738.....	S63DC-60-125
70-1739.....	S63DC-60-92
70-1741.....	S73DC-60-125

Peabody Galion

70-1742.....	S73DC-60-142
70-1743.....	S74DC-60-165.75
73126-G.....	S73DC-60-125
73142A.....	S73DC-60-142
74120.....	S74DC-74-120 CM38
74167.....	S74DC-60-165.75
84188-G.....	S84DC-66-188
85204.....	S85DC-66-197
85220.....	S85DC-66-220
95199.....	S95DC-52-190
95230.....	S95DC-52-220
95260.....	S95DC-52-250
C5381L.....	S53DC-60-81
C5389J.....	S53MB-5-90
C63108M.....	S63DC-60-106
C63126M.....	S63DC-60-125
C6380P.....	S63DC-60-79.12
C6392H.....	S63DC-60-92
C73126D.....	S73DC-60-125
C73126J.....	S73DC-60-125
C73142D.....	S73DC-60-142
C73142F.....	S73DC-60-142
C74167F.....	S74DC-60-165.75
D5381F.....	S53DC-60-81
D5389F.....	S53MB-5-90
D63108H.....	S63DC-60-106
D63108K.....	S63DC-60-106
D63128G.....	S63DC-60-125
D63128K.....	S63DC-60-125
D6380M.....	S63DC-60-79.12
D6392E.....	S63DC-60-92
D6392F.....	S63DC-60-92
D73126D.....	S73DC-60-125
D73126E.....	S73DC-60-125
D73126F.....	S73DC-60-125
D73126G.....	S73DC-60-125
D73142B.....	S73DC-60-142
D73142C.....	S73DC-60-142
D74167D.....	S74DC-60-165.75
D74167E.....	S74DC-60-165.75
FD73-142A.....	S73DC-60-142
K5381P.....	S53DC-60-81
K5389K.....	S53MB-5-90
K5389L.....	S53MB-5-90
K63108N.....	S63DC-60-106
K63108R.....	S63MC-21-108
K63128R.....	S63DC-60-125
K63128U.....	S63MC-21-128
K6380T.....	S63DC-60-79.12
K6380W.....	S63MC-21-80
K6392K.....	S63DC-60-92
K73126M.....	S73DC-60-125
K73142G.....	S73DC-60-142
K74167G.....	S74DC-60-165.75

Perfection

375.....	M42DB-43-P
475.....	M52CB-43-P
53105V.....	S53DC-65-104
53120V.....	S53DC-65-120
5372V.....	S53DC-66-72 CM69
5388V.....	S53DC-66-84
63105V.....	S63DC-101-107
63120A.....	S63DC-101-120
63A132V.....	S63DC-96-130
73A132.....	S73DC-66-129
85A195V.....	S85DC-66-190
85A235V.....	S85DC-66-235
A154781.....	S84DC-66-170
A154875.....	S84DC-66-170
A154877.....	S84DC-66-140
A154879.....	S85DC-66-170
A1553380000.....	M42DB-43-P
A1553420000.....	M52CB-43-P
A22275.....	S53DC-65-120
A24176.....	M42DB-43-P
A24976.....	M52CB-43-P
A27123.....	S63DC-101-107
A27134.....	S63DC-101-120

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Note: It is the Users Responsibility to Verify if the Replacement Cylinder is Interchangeable.

Note: In some applications, modifications may be required for proper cylinder installation.



Quick Reference Guide

Perfection

A29651	S53DC-65-104
A29652, 53120V	S53DC-65-120
A29732	S53DC-66-84
A29741, 6388V	S63DC-101-86
A58627, 6386V	S63DC-101-86
A59327	S74DC-74-135
A68577	S53DC-66-72 CM69
A68827	S84DC-66-170
A68829	S85DC-66-170
A68832	S95DC-52-220
A68835	S95DC-52-250
A68841	S84DC-66-140
A68859	S63DC-96-130
A69064	S73DC-66-120
A69066	S74DC-74-120
A69067	S74DC-74-135
A69069	S85DC-66-170
A69070	S85DC-66-190
A69071	S85DC-66-220
A69072	S85DC-66-235
A69073	S85DC-66-250
A76479	S73DC-66-129
A80314	S84DC-66-170
A92097	S95DC-52-190
A94464	S85DC-66-235
A98278	S84DC-66-170
A99108	S85DC-66-190

Prince

AG284	D70LN-5-80
AH314	SD63CC-23-167
AW330	B1043
AW331	D70LN-5-80
AW332	D70LN-5-90
AW333	B2461
J1335	D60DB-23-72
S373	SD62CB-12-114
S588	D70LN-5-80
S589	D70LN-5-90

R/S Body

100655	S84DC-66-188 CM22
100665	S84DC-66-170 CM22
100720	S84DC-66-188 CM22
100742	S85MC-48-235
100756	S74DC-74-180
100859	S63DC-101-107 CM26
101055	S95DC-52-250 CM22
700100	S53DC-66-72
700102	S53DC-66-84
700103	S53DC-65-104
700104	S63DC-101-86
700106	S63DC-101-104
700108	S63DC-101-107
700109	S63DC-101-120
700110	S63DC-101-126
700112	S63DC-101-140
700114	S73DC-66-110
700116	S73DC-66-120
700118	S73DC-66-124
700120	S73DC-66-140
700122	S73DC-66-150
700124	S74DC-74-135
700126	S74DC-74-140
700128	S74DC-74-156
700130	S74DC-74-167
700132	S74DC-74-180
700134	S84DC-66-156
700135	S84DC-66-180
700136	S85DC-66-235
700138	S85DC-66-250
700140	S95DC-52-250
700142	S95DC-52-300
700146	S84DC-66-170
700148	S85DC-66-190
700150 RS	S85DC-66-220
700152	S85DC-66-265
700156	S95DC-52-235

R/S Body

700158	S95DC-52-320
700164	S95DC-52-280

Rapid Rail / Heil

L10-00	D17AE-2-71.88
L7-00	D30CC-20-8.00
L8-00	D30CC-19-16.00
P23-00	D50CC-25-43
T11-00	D30CE-11-18.50

Rosenboom Machine

100EM0149	D20DD-6-6.25
100EM0162	D20DD-6-6.25
100EP0026	D20DD-8-95
100GS0028	D32LL-11-38
100HS0058	D35CC-27-26
100HS0074	D35DD-7-17.88
100HV0010	S31CB-2-42
100KT0009	D45CC-20-46
100KV0018-5	D45DD-10-52.75
100KW0012	D45DD-9-23
100LW0017	D50CC-24-34.19
100LX0005	D50DD-29-25.62
100LX0006	D50DD-30-32.50
100LX0007-1	D50DD-32-37.25
100MX0006-1	D55CC-6-63
100MY0003-1	D55DD-14-38.62
102LB0002-5	SD52DC-CP626-38
102NC0004-5	SD63CC-44-164
102NC0005-5	SD63CC-44-181
102NC0013-5	1179422
102NC004-5	SD63CC-44-164
102NC005-5	SD63CC-44-181
102PD0003-5	SD74DC-7-119
120NC0014-5(-16)	SD53CC-48-164

Rudco

P28-022	D62LB-5-80
P28-052	D72LB-9-80

Skytop Brewster

082060-02-51	SD83CC-24-131
082060-02-54	SD83CC-24-132

Somerset Welding

CY-2018 B60-18	D84DB-7-25
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Steco

90015-1	S85MC-48-265
ST-90004	S85DC-66-250
ST-90005	S85DC-66-235
ST-90015	S85DC-66-265
ST-90017	S85DC-66-220
ST-90032	DAT96-48-492

Tesco Williamsen

327-01-100	S42MB-3-90
327-01-103	S53MB-3-120
327-01-104	S63MB-9-120
327-01-106	S63MB-8-140
327-01-107	S74MB-3-154
327-01-108	S74MB-3-172
327-01-127	S74MB-5-167
4290VI	S42MB-3-90
53120VI	S53MB-3-120
63120VI	S63MB-9-120
63140VI	S63MB-8-140
74154VI	S74MB-3-154
74172VI	S74MB-3-172
WFMS-4290T	S42MB-3-90
WFMS-53120T	S53MB-3-120
WHP-53120VI	S53MB-3-120
WHP-63140VI	S63MB-8-140
WHP-74154VI	S74MB-3-154
WHP-74172VI	S74MB-3-172

Texas Hydraulics

HS3520024SA	D35CD-10-20
HS5027048SF	D50CB-8-27
HS6034040SH	D60CD-5-34
S400722432PPAZ	D40DD-19-22.50
TH6079064PA3	D60DD-20-79
TH6079064PA-03	D60DD-20-79
TH7079064PA-5	D70DD-9-79

Ti Brook

701700320	S85DC-66-285
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Trailmobile

428-3-150	S85DC-66-190 CM53
428-3-151	S85DC-66-220 CM65
428-3-156	S95DC-52-235 CM42
428-3-157	S95DC-52-250 CM42
P1027	SD84CC-20-178

Universal Handling

M612-7000	D45DD-9-23
M612-8000	D50DD-30-32.50

Vector / Guzzler

1200334	S63DC-101-107
1201552	SD63DB-14-120
1202100	SD84MC-18-176

Wabash National

WC1392-2	S85DC-66-190
WC1392-3	S84DC-66-148
WALINGA	
64-16622-6	S85DC-66-220

Ward

5044-165	S74DC-74-161
5054-170	S85DC-66-170
5054-190	S85DC-66-190
5054-220	S85DC-66-220
5054-235	S85DC-66-235

Warren Inc

FHC-50166	S84DC-66-170
FHC-50167	S85DC-66-190
FHC-50168	S85DC-66-220
FHC-50169	S85DC-66-220
FHC-50171	S85DC-66-250
FHC-50172	S85DC-66-265
FHC-50191	S84DC-66-180

Western Trailer

8009-017	S85DC-66-220
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Wittke

014-0208	D35CD-11-19
095-6024	SD53CD-3-156.88
100-10-1801	D30DD-16-16.00
100-14-1610	D30DD-16-16.00
E0302160	D35CD-11-19
FL7-A066	D35CD-11-19
FL7-A110	D45LD-7-45.38
FL7-A116	SD53CD-3-156.88
FL7-A117	SD53CD-3-168
FL7-A117W	SD53CD-3-168
FL7-A118	SD53CD-3-185.75
FL7-A118W	SD53CD-3-185.75
FL7-A125	SD53CD-3-156.88
FL7-A125W	SD53CD-3-156.88
FLHC-25	D25LL-14-42
FLHC-26B	D40CL-13-45.38
FLHC-26C	D45LD-7-45.38
FLHC-27	D35LD-5-19
FLHC-28C	D45LD-7-45.38
FLHC-30	SD53CD-3-156.88
FLHC-31	SD53CD-3-168
FLHC-32	SD53CD-3-185.75
FLHC-34	D25LL-15-84
FLHC-42	D30DD-16-16.00

Crossover and Application Data is for Reference Purpose Only. No Other Conditions are Expressed or Implied.

Note: It is the Users Responsibility to Verify if the Replacement Cylinder is Interchangeable.

Note: In some applications, modifications may be required for proper cylinder installation.



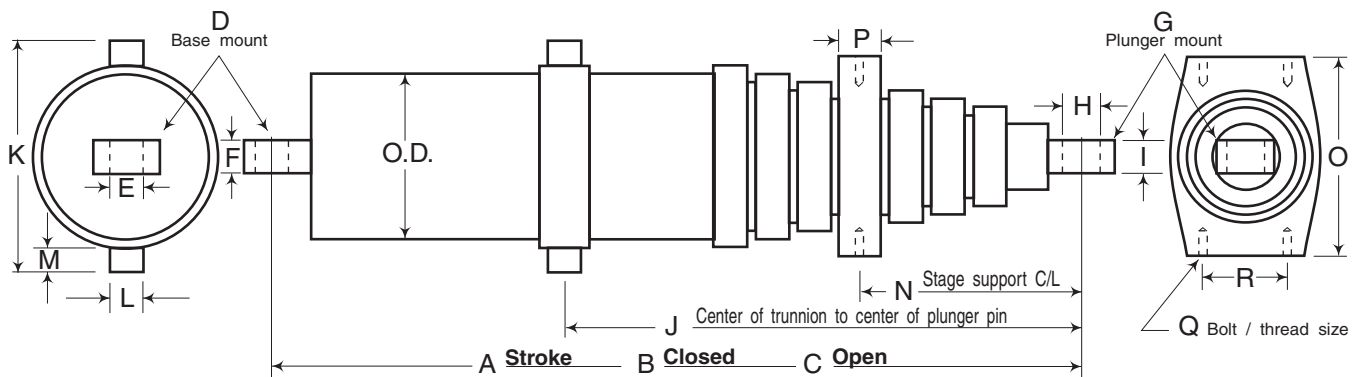
Quick Reference Guide

Wittke

MLHC-02	D50DD-25-40
FLHC-07	SD53CD-3-156.88
FLHC-08	SD53CD-3-168
FLHC-18	SD53CD-3-156.88
FLHC-19	SD53CD-3-168
FLHC-20	SD53CD-3-185.75
FLHC-27A	D35LD-5-19

Crossover and Application Data is for Reference Purpose Only. No Other Conditions are Expressed or Implied.
Note: It is the Users Responsibility to Verify if the Replacement Cylinder is Interchangeable.
Note: In some applications, modifications may be required for proper cylinder installation.

Telescopic Cylinder Application Data Form



Cylinder application _____

Single- or Double-acting _____ System operating pressure Normal ____ Max. ____

O.D. of body _____ Is there a relief valve in system ____ Setting ____

O.D. largest moving stage _____ System flow in G.P.M Min. ____ Max. ____

Number of moving stages _____ System operating temp. Normal ____ Max. ____

Chrome or non-chrome stages _____ Fluid type _____

Mounting conditions ____ Vert. ____ Horz. ____ Incline angle Load holding requirements _____

Any side or eccentric loading possible _____ Environmental condition _____

A : Total stroke _____ J : Plunger pin to trunnion C/L (if applicable) _____

B : Closed length _____ K : Trunnion overall width _____

C : Open length _____ L : Trunnion lug diameters _____

D : Base mount type or code _____ M : Trunnion lug lengths _____

E : Base pin diameter _____ N : Plunger pin to stage support (if applicable) _____

F : Base mount width _____ O : Stage support width _____

G : Plunger mount type or code _____ P : Stage support thickness _____

H : Plunger pin diameter _____ Q : Stage support bolt & thread size _____

I : Plunger mount width _____ R : Stage support bolt locations & C/L's _____

Special mounting (if applicable) _____

Extend port size and type _____ Extend port location _____

Retract port size and type _____ Retract port location _____

Special features or comments _____

Requested by: Firm _____ Current Quan. _____

Address _____ Future Quan. _____

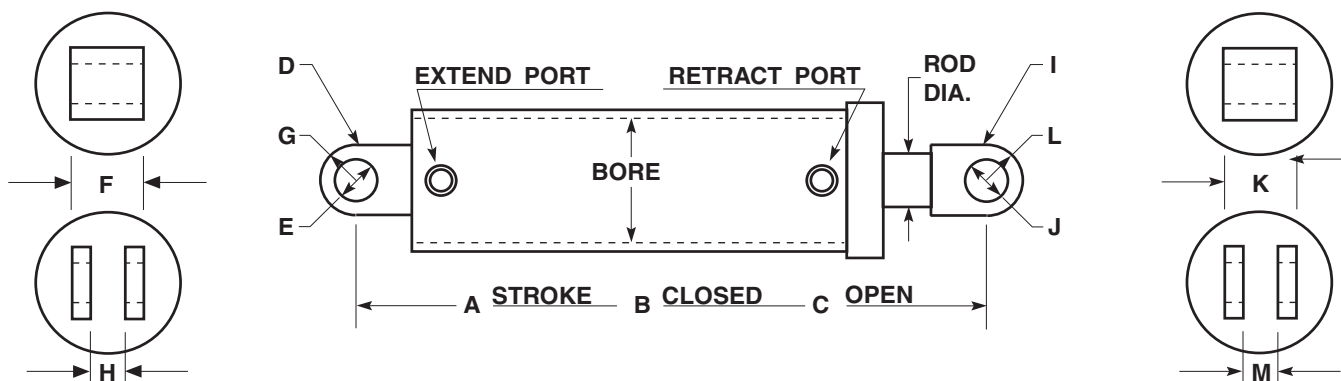
City _____ State _____ Zip _____

Phone _____ Fax _____

Contact _____

Phone: (800) 848-5575 * 330-480-8431 * Fax (800) 694-3392 * 330-480-8432

Piston Rod Cylinder Application Data Form



Cylinder application _____

Single- or Double-acting _____ System operating pressure Normal ____ Max. ____

Bore _____ Is there a relief valve in system ____ Setting ____

Rod diameter _____ System flow in G.P.M Min. ____ Max. ____

Head & gland design _____ System operating temp. Normal ____ Max. ____

Piston design _____ Fluid type _____

Mounting conditions ____Vert. ____Horz. ____Incline angle Load holding requirements _____

Any side or eccentric loading possible _____ Environmental condition _____

A : Total stroke _____

B : Closed length _____

C : Open length _____

D : Base mount type or code _____

E : Base pin diameter _____

F : Base mount width _____

G : Base mount radius _____

H : Base Clevis Gap (if applicable) _____

I : Plunger mount type or code _____

J : Plunger pin diameter _____

K : Plunger mount width _____

L : Plunger mount radius _____

M : Plunger clevis gap (if applicable) _____

Special mounting (if applicable) _____

Extend port size and type _____ Extend port location _____

Retract port size and type _____ Retract port location _____

Special features or comments _____

Requested by: Firm _____ Current Quan. _____

Address _____ Future Quan. _____

City _____ State _____ Zip _____

Phone _____ Fax _____

Contact _____

Phone: (800) 848-5575 * 330-480-8431 * Fax (800) 694-3392 * 330-480-8432

Storage and Installation

STORAGE

It pays to keep spare hydraulic cylinders on hand for use when you need them. But, you must know and follow these recommended storage practices or the cylinders can be ruined. Hydraulic cylinders, though often large and unwieldy, are precision machines with finely finished parts and close tolerances. And they're expensive. So handle them with care.

For optimum storage life, hydraulic cylinders should be kept in an environment that is protected from excessive moisture and temperature extremes. A hot, dry desert climate with cold nights, for example, must be accommodated when choosing the storage area. Daytime heat quickly bakes oil out of sealing materials, which causes leaks and rapid wear when the cylinder is placed in service. Cooling at night causes water condensation and corrosion damage to wear surfaces. Storage areas that allow exposure to rain, snow and extreme cold must like wise be avoided.

It's best to store cylinders indoors if possible. But indoors or out, be sure that plugs or closures are properly installed in all ports to keep out moisture and dirt. However, overtightening of port plugs should be avoided. Widely varying temperatures and tightly closed ports may cause pressure inside the cylinder to build up to the point where the piston moves far enough to expose the rod to corrosion or contamination. Try to choose a storage location where the cylinders are protected from physical damage. Even a little ding from a falling bar or forklift tine can cause trouble later.

Cylinders, Particularly large ones, should be stored closed in a vertical position with the rod end down. Be sure they're blocked securely to keep them from toppling. Storing with the rod ends down keeps oil on the seals, which protects them from drying out. This is more critical with fabric and butyl seals than with urethane sealing materials. Storing single-acting cylinders with the rod end up can cause port closures to pop open and leak, exposing the sleeves to corrosion damage and contamination. Storing with the rod end down also discourages the temptation to lift a cylinder by the rod eye – a dangerous practice. If horizontal storage cannot be avoided, the rod or cylinder should be rolled into a new position every two months or so to prevent drying, distortion and deterioration of the seals. Don't forget that a cylinder can be a major source of contamination. A small scratch or nick on the sleeve will quickly shred packing and contaminate the system. Store cylinders carefully and keep them clean.

The following procedures should be followed in order to prevent oxidation and maintain the surfaces of a mounted hydraulic cylinder during idle periods. These idle periods may include; inventory units, demo units, out of service units, etc.

- All machined surfaces left expose should be coated with a light film of grease, if not oxidation will occur.
- If oxidation is present, apply a light coat of oil to the surfaces.
- Buff surfaces with 320 or 400 grit sandpaper. Do not buff surfaces up and down the length, buff only around the circumference.
- If after buffing, the surfaces show evidence of oxidation damage i.e., pitting, the cylinder should be inspected by an authorized service center for evaluation.
- Operation of a hydraulic cylinder with surface damage will shorten the longevity and preclude any warranty express or implied.

INSTALLATION

- Cleanliness is an important consideration, and Parker cylinders are shipped with the ports plugged to protect them from contaminants entering the ports. These plugs should not be removed until the piping is to be installed. Before making the connection to the cylinder ports, the piping should be thoroughly cleaned to remove all chips or burrs which might have resulted from threading or flaring operations. One small foreign particle can cause premature failure of the cylinder or other hydraulic system components. If oxidation is present, apply a light coat of oil to the surfaces.
- Proper alignment of the cylinder piston rod and its mating component on the machine should be checked in both the extended and retracted positions. Improper alignment will result in excessive rod gland and/or cylinder bore wear.
- Cylinders operating in an environment where air drying material are present such as fast- drying chemicals, paint, or welding splatter, or other hazardous conditions such as excessive heat, should have shields installed to prevent damage to the piston rod and piston rod seals.

Parker Safety Guide for Selecting and Using Hydraulic Cylinders and Their Accessories

WARNING:  FAILURE OR IMPROPER SELECTION OR IMPROPER USE OF CYLINDERS AND THEIR RELATED ACCESSORIES CAN CAUSE DEATH, PERSONAL INJURY AND PROPERTY DAMAGE.

Before selecting or using Parker cylinders or related accessories, it is important that you read, understand and follow the following safety information.

User Responsibility

Due to very wide variety of cylinder applications and cylinder operating conditions, Parker does not warrant that any particular cylinder is suitable for any specific application. This safety guide does not analyze all technical parameters that must be considered in selecting a product. The hydraulic and pneumatic cylinders outlined in this catalog are designed to Parker's design guide lines and do not necessarily meet the design guide lines of other agencies such as American Bureau of Shipping, ASME Pressure Vessel Code etc. The user, through its own analysis and testing, is solely responsible for:

- Making the final selection of the cylinders and related accessories.
- Determining if the cylinders are required to meet specific design requirements as required by the Agency(s) or industry standards covering the design of the user's equipment.
- Assuring that the user's requirements are met, OSHA requirements are met, and safety guidelines from the applicable agencies such as but not limited to ANSI are followed and that the use presents no health or safety hazards.
- Providing all appropriate health and safety warnings on the equipment on which the cylinders are used.

Seals

The seals for the product lines shown in this catalogue are intended for mineral base hydraulic fluids and for the operating temperatures ranges as indicated. The operation of these products with other fluids or at other operating temperatures must be brought to the attention of our engineering department so that proper seals for intended operation may be selected.

The application of cylinders may allow fluids such as cutting fluids, wash down fluids etc. to come in contact with the external area of the cylinder. These fluids may attack the piston rod wiper and or the primary seal and must be taken into account when selecting and specifying seal compounds.

Dynamic seals will wear. The rate of wear will depend on many operating factors. Wear can be rapid if a cylinder is mis-aligned or if the cylinder has been improperly serviced. The user must take seal wear into consideration in the application of cylinders.

Piston Rods

Possible consequences of piston rod failure or separation of the piston rod from the piston include, but are not limited to are:

- Piston rod and or attached load thrown off at high speed.
- High velocity fluid discharge.
- Piston rod extending when pressure is applied in the piston retract mode.

Piston rods or machine members attached to the piston rod may move suddenly and without warning as a consequence of other conditions occurring to the machine such as, but not limited to:

- Unexpected detachment of the machine member from the piston rod.
- Failure of the pressurized fluid delivery system (hoses, fittings, valves, pumps, compressors) which maintain cylinder position.
- Catastrophic cylinder seal failure leading to sudden loss of pressurized fluid.
- Failure of the machine control system.

Part of selecting cylinders for a specific operation involves the proper selection of the piston rod diameter. This catalogue contains information in the selection of piston rod diameter, which must be followed in order to avoid possible buckling.

Piston rods are not normally designed to absorb bending moments or loads which are perpendicular to the axis of piston rod motion. These additional loads can cause the piston rod to fail. If these types of additional loads are expected to be imposed on the piston rod, their magnitude should be made known to our engineering department.

The cylinder user should always make sure that the piston rod is securely attached to the machine member.

Cushions

Cushions are devices internal to the cylinder to slow the piston and rod assembly down at the end of the stroke. It is suggested they be used to reduce piston impact at the end of the cylinder stroke when the cylinder is expected to move at relatively high velocity.

Cylinder cushions are normally designed to absorb the energy of a linear applied load. A rotating mass has considerably more energy than the same mass moving in a linear mode. Cushioning for a rotating mass application should be review by our engineering department.

Cylinder Mountings

Some cylinder mounting configurations may have certain limitations such as but not limited to minimum stroke for side or foot mounting cylinders or pressure de-ratings for certain flange mounts. Carefully review the catalog for these types of restrictions.

Always mount cylinders using the largest possible high tensile alloy steel socket head cap screws that can fit in the cylinder mounting holes and torque them to the manufacturer's recommendations for their size.

Port Fittings

Hydraulic cylinders applied with meter out or deceleration circuits are subject to intensified pressure at piston rod end.

The rod end pressure is approximately equal to:

$$\frac{\text{operating pressure} \times \text{effective cap end area}}{\text{effective rod end piston area}}$$

Contact your connector supplier for the pressure rating of individual connectors.

Cylinder Modifications or Repairs

Cylinders as shipped from the factory are not to be disassembled and or modified. If cylinders require modifications, these modifications must be done at Parker locations or by Parker certified facilities. The Mobile Cylinder Division Engineering Department must be notified in the event of a mechanical fracture or permanent deformation of any cylinder component (excluding seals). This includes a broken piston rod, mounting accessory or any other cylinder component. This notification should include all operation and application details. This information will be used to provide an engineered repair that will prevent recurrence of the failure. It is allowed to disassemble cylinders for the purpose of replacing seals or seal assemblies.

Offer of Sale

The items described in this document and other documents and descriptions provided by Parker Hannifin Corporation, its subsidiaries and its authorized distributors ("Seller") are hereby offered for sale at prices to be established by Seller. This offer and its acceptance by any customer ("Buyer") shall be governed by all of the following Terms and Conditions. Buyer's order for any item described in this document, when communicated to Seller verbally, or in writing, shall constitute acceptance of this offer. All goods or work described will be referred to as "Products".

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6. **LIMITATION OF LIABILITY.** UPON NOTIFICATION, SELLER WILL, AT ITS OPTION, REPAIR OR REPLACE A DEFECTIVE PRODUCT, OR REFUND THE PURCHASE PRICE. IN NO EVENT SHALL SELLER BE LIABLE TO BUYER FOR ANY SPECIAL, INDIRECT, INCIDENTAL OR CONSEQUENTIAL DAMAGES ARISING OUT OF, OR AS THE RESULT OF, THE SALE, DELIVERY, NON-DELIVERY, SERVICING, USE OR LOSS OF USE OF THE PRODUCTS OR ANY PART THEREOF, OR FOR ANY CHARGES OR EXPENSES OF ANY NATURE INCURRED WITHOUT SELLER'S WRITTEN CONSENT, EVEN IF SELLER HAS BEEN NEGLIGENT, WHETHER IN CONTRACT, TORT OR OTHER LEGAL THEORY. IN NO EVENT SHALL SELLER'S LIABILITY UNDER ANY CLAIM MADE BY BUYER EXCEED THE PURCHASE PRICE OF THE PRODUCTS.
7. **Contingencies.** Seller shall not be liable for any default or delay in performance if caused by circumstances beyond the reasonable control of Seller.
8. **User Responsibility.** The user, through its own analysis and testing, is solely responsible for making the final selection of the system and Product and assuring that all performance, endurance, maintenance, safety and warning requirements of the application are met. The user must analyze all aspects of the application and follow applicable industry standards and Product information. If Seller provides Product or system options, the user is responsible for determining that such data and specifications are suitable and sufficient for all applications and reasonably foreseeable uses of the Products or systems.
9. **Loss to Buyer's Property.** Any designs, tools, patterns, materials, drawings, confidential information or equipment furnished by Buyer or any other items which become Buyer's property, may be considered obsolete and may be destroyed by Seller after two consecutive years have elapsed without Buyer placing an order for the items which are manufactured using such property. Seller shall not be responsible for any loss or damage to such property while it is in Seller's possession or control.
10. **Special Tooling.** A tooling charge may be imposed for any special tooling, including without limitation, dies, fixtures, molds and patterns, acquired to manufacture Products. Such special tooling shall be and remain Seller's property notwithstanding payment of any charges by Buyer. In no event will Buyer acquire any interest in apparatus belonging to Seller which is utilized in the manufacture of the Products, even if such apparatus has been specially converted or adapted for such manufacture and notwithstanding any charges paid by Buyer. Unless otherwise agreed, Seller shall have the right to alter, discard or otherwise dispose of any special tooling or other property in its sole discretion at any time.
11. **Buyer's Obligation; Rights of Seller.** To secure payment of all sums due or otherwise, Seller shall retain a security interest in the goods delivered and this agreement shall be deemed a Security Agreement under the Uniform Commercial Code. Buyer authorizes Seller as its attorney to execute and file on Buyer's behalf all documents Seller deems necessary to perfect its security interest. Seller shall have a security interest in, and lien upon, any property of Buyer in Seller's possession as security for the payment of any amounts owed to Seller by Buyer.
12. **Improper use and Indemnity.** Buyer shall indemnify, defend, and hold Seller harmless from any claim, liability, damages, lawsuits, and costs (including attorney fees), whether for personal injury, property damage, patent, trademark or copyright infringement or any other claim, brought by or incurred by Buyer, Buyer's employees, or any other person, arising out of: (a) improper selection, improper application or other misuse of Products purchased by Buyer from Seller; (b) any act or omission, negligent or otherwise, of Buyer; (c) Seller's use of patterns, plans, drawings, or specifications furnished by Buyer to manufacture Product; or (d) Buyer's failure to comply with these terms and conditions. Seller shall not indemnify Buyer under any circumstance except as otherwise provided.
13. **Cancellations and Changes.** Orders shall not be subject to cancellation or change by Buyer for any reason, except with Seller's written consent and upon terms that will indemnify, defend and hold Seller harmless against all direct, incidental and consequential loss or damage. Seller may change product features, specifications, designs and availability with notice to Buyer.
14. **Limitation on Assignment.** Buyer may not assign its rights or obligations under this agreement without the prior written consent of Seller.
15. **Entire Agreement.** This agreement contains the entire agreement between the Buyer and Seller and constitutes the final, complete and exclusive expression of the terms of the agreement. All prior or contemporaneous written or oral agreements or negotiations with respect to the subject matter are herein merged.
16. **Waiver and Severability.** Failure to enforce any provision of this agreement will not waive that provision nor will any such failure prejudice Seller's right to enforce that provision in the future. Invalidity of any provision of this agreement by legislation or other rule of law shall not invalidate any other provision herein. The remaining provisions of this agreement will remain in full force and effect.
17. **Termination.** This agreement may be terminated by Seller for any reason and at any time by giving Buyer thirty (30) days written notice of termination. In addition, Seller may by written notice immediately terminate this agreement for the following: (a) Buyer commits a breach of any provision of this agreement (b) the appointment of a trustee, receiver or custodian for all or any part of Buyer's property (c) the filing of a petition for relief in bankruptcy of the other Party on its own behalf, or by a third party (d) an assignment for the benefit of creditors, or (e) the dissolution or liquidation of the Buyer.
18. **Governing Law.** This agreement and the sale and delivery of all Products hereunder shall be deemed to have taken place in and shall be governed and construed in accordance with the laws of the State of Ohio, as applicable to contracts executed and wholly performed therein and without regard to conflicts of laws principles. Buyer irrevocably agrees and consents to the exclusive jurisdiction and venue of the courts of Cuyahoga County, Ohio with respect to any dispute, controversy or claim arising out of or relating to this agreement. Disputes between the parties shall not be settled by arbitration unless, after a dispute has arisen, both parties expressly agree in writing to arbitrate the dispute.
19. **Indemnity for Infringement of Intellectual Property Rights.** Seller shall have no liability for infringement of any patents, trademarks, copyrights, trade dress, trade secrets or similar rights except as provided in this Section. Seller will defend and indemnify Buyer against allegations of infringement of U.S. patents, U.S. trademarks, copyrights, trade dress and trade secrets ("Intellectual Property Rights"). Seller will defend at its expense and will pay the cost of any settlement or damages awarded in an action brought against Buyer based on an allegation that a Product sold pursuant to this Agreement infringes the Intellectual Property Rights of a third party. Seller's obligation to defend and indemnify Buyer is contingent on Buyer notifying Seller within ten (10) days after Buyer becomes aware of such allegations of infringement, and Seller having sole control over the defense of any allegations or actions including all negotiations for settlement or compromise. If a Product is subject to a claim that it infringes the Intellectual Property Rights of a third party, Seller may, at its sole expense and option, procure for Buyer the right to continue using the Product, replace or modify the Product so as to make it non-infringing, or offer to accept return of the Product and return the purchase price less a reasonable allowance for depreciation. Notwithstanding the foregoing, Seller shall have no liability for claims of infringement based on information provided by Buyer, or directed to Products delivered hereunder for which the designs are specified in whole or part by Buyer, or infringements resulting from the modification, combination or use in a system of any Product sold hereunder. The foregoing provisions of this Section shall constitute Seller's sole and exclusive liability and Buyer's sole and exclusive remedy for infringement of Intellectual Property Rights.
20. **Taxes.** Unless otherwise indicated, all prices and charges are exclusive of excise, sales, use, property, occupational or like taxes which may be imposed by any taxing authority upon the manufacture, sale or delivery of Products.
21. **Equal Opportunity Clause.** For the performance of government contracts and where dollar value of the Products exceed \$10,000, the equal employment opportunity clauses in Executive Order 11246, VEVRRA, and 41 C.F.R. §§ 60-1.4(a), 60-741.5(a), and 60-250.4, are hereby incorporated.



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Parker Hannifin Corporation

About Parker Hannifin Corporation

Parker Hannifin is a leading global motion-control company dedicated to delivering premier customer service. A Fortune 500 corporation listed on the New York Stock Exchange (PH), our components and systems comprise over 1,400 product lines that control motion in some 1,000 industrial and aerospace markets. Parker is the only manufacturer to offer its customers a choice of hydraulic, pneumatic, and electromechanical motion-control solutions. Our Company has the largest distribution network in its field, with over 7,500 distributors serving nearly 400,000 customers worldwide.

Parker's Charter

To be a leading worldwide manufacturer of components and systems for the builders and users of durable goods. More specifically, we will design, market and manufacture products controlling motion, flow and pressure. We will achieve profitable growth through premier customer service.

Product Information

North American customers seeking product information, the location of a nearby distributor, or repair services will receive prompt attention by calling the Parker Product Information Center at our toll-free number: 1-800-C-PARKER (1-800-272-7537). In Europe, call 00800-C-PARKER-H (00800-2727-5374).

The Aerospace Group

is a leader in the development, design, manufacture and servicing of control systems and components for aerospace and related high-technology markets, while achieving growth through premier customer service.



The Climate & Industrial Controls Group

designs, manufactures and markets system-control and fluid-handling components and systems to refrigeration, air-conditioning and industrial customers worldwide.



The Fluid Connectors Group

designs, manufactures and markets rigid and flexible connectors, and associated products used in pneumatic and fluid systems.



The Seal Group designs, manufactures and distributes industrial and commercial sealing devices and related products by providing superior quality and total customer satisfaction.



The Hydraulics Group

designs, produces and markets a full spectrum of hydraulic components and systems to builders and users of industrial and mobile machinery and equipment.



The Filtration Group

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The Automation Group is a leading supplier of pneumatic and electromechanical components and systems to automation customers worldwide.



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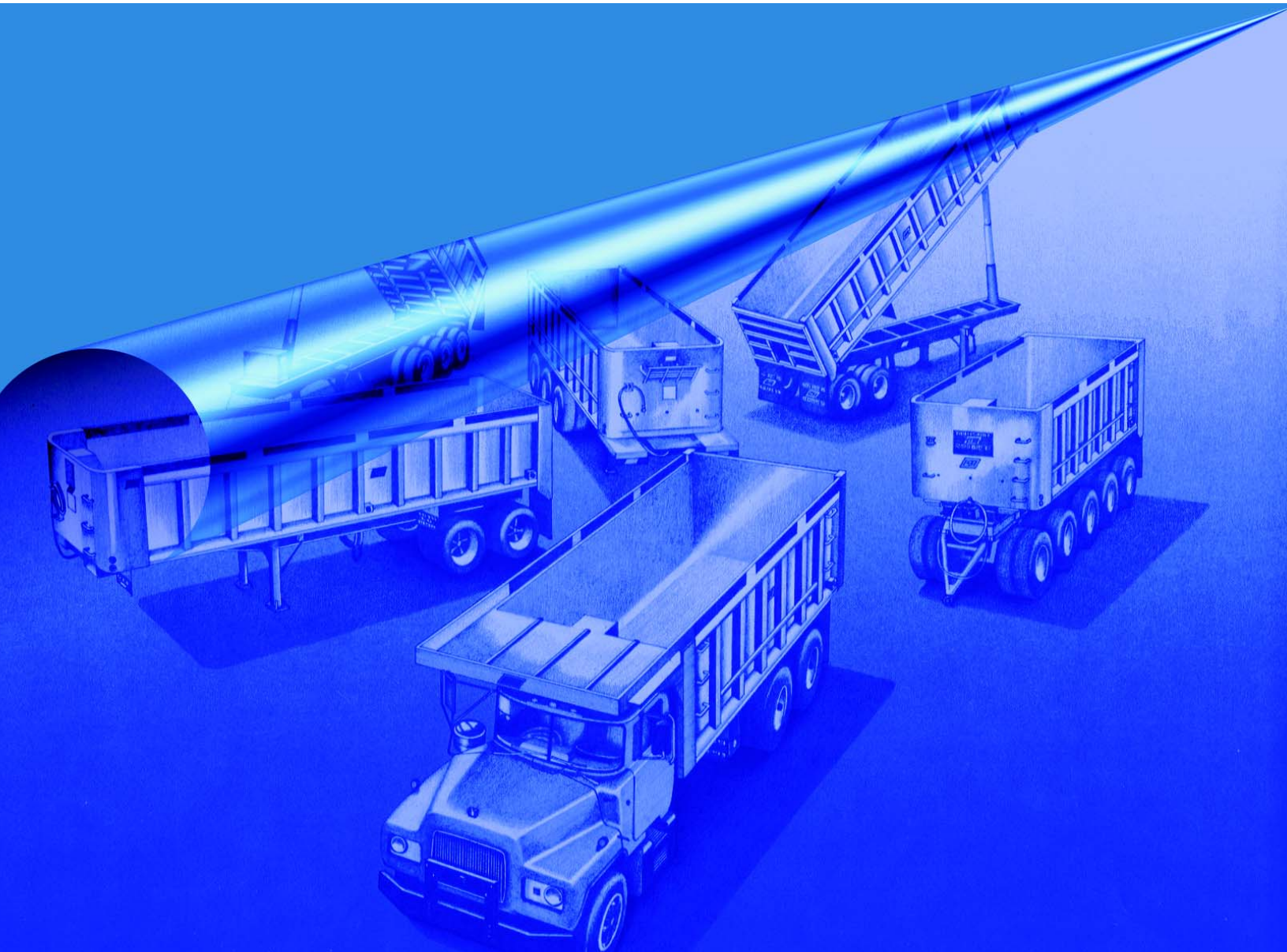




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fax (330) 480-8432
www.parker.com

Catalog HY18-0031/US 2M, 04/09

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Mobile Cylinder Div. Dump Product Information

Catalog HY18-0024/US Rev B

aerospace
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electromechanical
filtration
fluid & gas handling
hydraulics
pneumatics
process control
sealing & shielding



ENGINEERING YOUR SUCCESS.

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FAILURE OR IMPROPER SELECTION OR IMPROPER USE OF THE PRODUCTS DESCRIBED HEREIN OR RELATED ITEMS CAN CAUSE DEATH, PERSONAL INJURY AND PROPERTY DAMAGE.

This document and other information from Parker-Hannifin Corporation, its subsidiaries and authorized distributors provide product or system options for further investigation by users having technical expertise.

The user, through its own analysis and testing, is solely responsible for making the final selection of the system and components and assuring that all performance, endurance, maintenance, safety and warning requirements of the application are met. The user must analyze all aspects of the application, follow applicable industry standards, and follow the information concerning the product in the current product catalog and in any other materials provided from Parker or its subsidiaries or authorized distributors.

To the extent that Parker or its subsidiaries or authorized distributors provide component or system options based upon data or specifications provided by the user, the user is responsible for determining that such data and specifications are suitable and sufficient for all applications and reasonably foreseeable uses of the components or systems.

Offer of Sale

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Cylinders were among the first hydraulic products of Commercial Hydraulics beginning in 1928. In 2000 Commercial Intertech Corp. merged with the Parker Hannifin Corp. Today, the Parker Mobile Cylinder Division is recognized as one of the largest independent manufacturers of hydraulic cylinders for mobile equipment and a leading supplier to refuse, mining, truck, material handling and positioning markets. Parker's Mobile Cylinder Division products include double- and single-acting telescopic cylinders, rod cylinders and "smart cylinders" with internal electronic controls.

Additionally, the company enjoys a reputation for quality custom built cylinders that demonstrate engineering know how and adept manufacturing. Cylinders represent a significant portion of the company's Hydraulic Systems sales - their contribution has resulted in significant capital expenditures geared to establish Parker's Mobile Cylinder Division as the world's leading manufacturer of hydraulic cylinders.

About our Quick Reference and Application Guide . . .

It's our goal to provide our customers with the highest quality cylinders. If the need arises for a cylinder not listed in this guide, please furnish us the following information and we'll do our best to provide a new or replacement.

- | | |
|---|-----------------------------------|
| * OEM identification number | * Retract or closed length |
| * Single- or double-acting type | * Stroke length |
| * Outside diameter of the largest moving stage or rod and bore diameters | * Extend or open length |
| * Number of moving stages | * Pineye sizes |
| * Application | * Plunger mount type |
| | * Base mount type |
- Please refer to the cylinder specification data forms for more information.**

Parker's Mobile Cylinder Division has complete manufacturing facilities to fill all your cylinder needs from 1 piece to 1000 pieces. If you're looking for a prototype, a special cylinder, or a production run, Parker's Mobile Cylinder Division is the place to call.

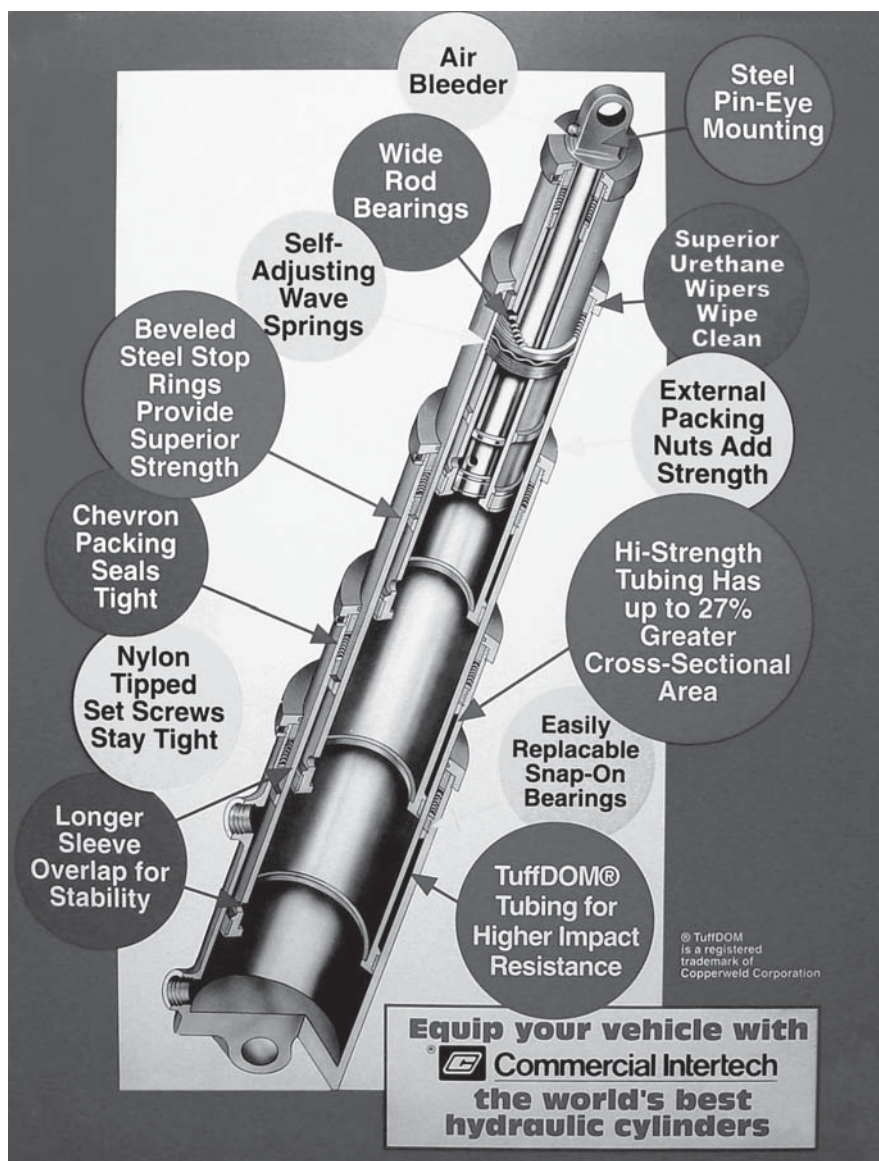
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OUR DESIGN ADVANTAGES INCLUDE:

- * Longer sleeve overlap for improved stability and higher column loading.
- * Nylon tipped set screws that conform to the shape of the packing nut threads. It is nearly impossible for the packing nut to back off accidentally.
- * Snap-on, glass-filled bearings that absorb contaminants without damaging cylinder walls.
- * Threaded steel stop rings for easier servicing and more reliable stopping action.
- * External packing nuts give added support to the tube exterior while making service procedures easier.
- * Wave springs and chevron packing for self-compensating seals.
- * Polyurethane rod wipers that resist higher temperatures without extrusion.
- * Positive manual air bleeder prevents cavitation and “mushy” cylinder action, **NOW BLEEDRELESS**.
- * Cast steel mountings offer dependable strength. Pin-eye and rod-end are welded into a single unit.

Bleederless Telescopic Cylinders

Innovative Mobile Solutions From
Mobile Cylinder Division



Customer Unmet Need:

Bleeding cylinders is a tough dirty job for the dump truck and trailer industry. No one really wants to bleed the cylinder because it is a dirty, dangerous, and environmentally hazardous job as the mechanic must climb in and out of the dump bed to adjust the bleeder screw. Failure to bleed the cylinder will result in early cylinder failure in addition to cylinder mis-staging, and excessive costly hydraulic repairs.

Solution:

Parker has developed a special bleed system that is incorporated into the cylinder that allows air to bleed every time the dump bed goes up and down. This keeps the cylinder free of air and as a result the bleeding of oil and air is eliminated.



Contact Information:

Parker Hannifin Corporation
Mobile Cylinder Division
1775 Logan Avenue
Youngstown, Ohio 44505

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fax 800 694 3392
mcdsales@parker.com

www.parker.com

HY18-0027/US

Value Added:

- Fleets using Parker's high quality cylinders will benefit by saving the labor charges from bleeding cylinders through out the life time of the Dump Bed \$800-\$2400.
- OEM's save a minimum of 1/2 gallon of hydraulic oil to 4.5 gallons of oil on 8" and 9" cylinders. For a trailer manufacturer selling 500 a year this would save \$23,625 a year.

Product Features:

- No air to bleed
- No speedy dry to sweep
- No EPA to deal with
- No more climbing into dirty beds
- Fewer hydraulic repairs
- Completely interchangeable with all manufacturers cylinders
- Size Range from 4" to the largest 9" cylinders
- Reduced weight over standard cylinders with bleeder screws



ENGINEERING YOUR SUCCESS.

Hydraulic Cylinder Model Number Coding

The code and model numbers of a Parker Mobile (Commercial) Cylinder are references to its size and type. Using these numbers when ordering or inquiring greatly facilitates accurate understanding.

The following are examples of Parker Mobile Cylinder code and model numbers.

Single-acting Telescopic

S63MB-9-120

↑ ↑ ↑ ↑ ↑ ↑
① ② ③ ④ ⑤ ⑥ ⑦

Double-acting Telescopic

SD96CC-3-199

↑ ↑ ↑ ↑ ↑ ↑
① ② ③ ④ ⑤ ⑥ ⑦

Double-acting Piston Rod

D72LB-11-83

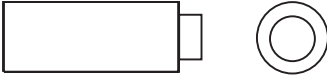
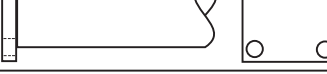
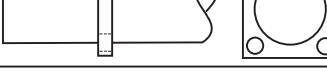
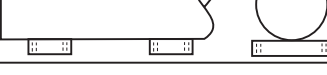
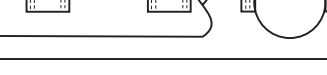
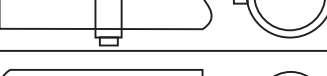
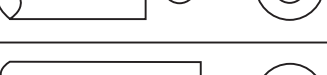
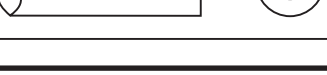
↑ ↑ ↑ ↑ ↑
① ② ④ ⑤ ⑥ ⑦

1. **S = Single-acting Telescopic or Displacement Cylinder**
(Parker has also used SA, SF, and H as a prefix)
SD = Double-acting Telescopic Cylinder
D = Double-acting Piston Rod Cylinder
2. **= Nominal O.D. of the largest moving stage on**
Single-acting and Double-acting Telescopic cylinders
or the
Nominal Bore of Double-acting Piston Rod Cylinders
3. **= Number of moving stages or sleeves in a Telescopic Cylinder**
4. **= Mounting option on the body or base end of cylinder**
(See mounting Option and Code Chart for mount descriptions)
5. **= Mounting option on the rod or plunger end of cylinder**
(See mounting Option and Code Chart for mount descriptions)
6. **= Modification or design variation of the cylinder**
7. **= Length of cylinder stroke in inches**

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- * Wave springs and chevron packing for self-compensating seals.
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- * Cast steel mountings offer dependable strength. Pin-eye and rod-end are welded into a single unit.

Mounting Options and Code Chart

Code Letter	Mount Description	Mount Sketch	Mount Location
A	Plain No Mount		Body or Rod
B	Pin-Eye Drilled Thru Rod		Rod
C	Pin-Eye Drilled Thru Lug		Body or Rod
D	Cross Tube		Body or Rod
E	Threaded		Body or Rod
F	Drilled and Tapped		Body or Rod
G	Flange Mount at Base		Body
H	Flange Mount Mid-Body		Body
J	Foot / Pad Mount		Body
K	Centerline Mount		Body
L	Double Lug Clevis Mount		Body or Rod
M	Trunnion Mount		Body
N	Rod End Drilled and Tapped		Rod
O	Ball Mount		Body or Rod
P	Socket Mount		Body or Rod

Hydraulic Cylinder Load & Displacements

“ S ” SERIES SINGLE-ACTING, SINGLE & MULTIPLE STAGE CYLINDERS

Sleeve or Plunger O.D. (in inches)	Effective Area in square inches	Load Capacity lbs @ 2000 p.s.i.	Displacement per inch of stroke in gallons *
1.75"	2.41"	4,811	0.010
2.75"	5.94"	11,880	0.026
3.75"	11.04"	22,089	0.048
4.75"	17.72"	35,441	0.077
5.75"	25.97"	51,935	0.112
6.75"	35.78"	71,570	0.155
7.90"	49.02"	98,034	0.212
9.38"	69.03"	138,059	0.299
10.75"	90.76"	181,526	0.393
12.50"	122.72"	245,438	0.531
14.00"	153.94"	307,877	0.666

“ SD ” SERIES DOUBLE-ACTING, MULTIPLE STAGE CYLINDER

Sleeve or Plunger O.D. (in inches)	Bore of Main or Sleeve (in inches)	Effective area (sq. inches) to extend	Effective area (sq. inches) to retract	Load capacity lbs @ 2000 p.s.i. extending	Load capacity lbs @ 2000 p.s.i. retracting	Displacement per inch of stroke (in gallons)* to extend	Displacement per inch of stroke (in gallons)* to retract
1.75"	2.25"	3.98"	1.57"	7,952	3,142	0.017	0.007
2.75"	3.25"	8.29"	2.35"	16,592	4,712	0.036	0.010
3.75"	4.25"	14.18"	3.14"	28,372	6,283	0.061	0.014
4.75"	5.25"	21.64"	3.92"	43,296	7,854	0.094	0.017
5.75"	6.25"	30.68"	4.71"	61,360	9,426	0.133	0.020
6.75"	7.25"	41.28"	5.49"	82,564	10,994	0.179	0.024
7.90"	8.44"	55.68"	6.97"	111,360	13,946	0.242	0.030
9.38"	9.88"	76.59"	7.56"	153,180	15,120	0.332	0.033
10.75"	11.50"	103.87"	13.11"	207,738	26,213	0.450	0.057
12.50"	13.00"	132.73"	10.01"	265,465	20,028	0.575	0.043
14.00"	14.50"	165.13"	11.19"	330,261	22,384	0.715	0.048

Note: The Effective area to RETRACT a Standard “SD” series double acting multiple stage cylinder is the effective area of the PLUNGER (plunger bore area minus the plunger O.D. area).

Example: Retract force for a SD94CC-8-190 (which has 5.75" O.D. plunger and fits in 6.25" bore) would be 9,426 lbs @ 2,000 psi, based on a 4.71 sq. in. effective area.

To calculate effective area in square inches: Multiply diameter times diameter times .78

Example: 5 dia. x 5 dia. = 25 x .78 = 19.63 Square inches of area

To calculate load capacity / cylinder force: Multiply effective area times operating pressure (psi)

Example: 19.63 Square inches x 1750 P.S.I = 34,361 lbs of force

To calculate the required gallons of fluid to extend a cylinder:

Add each “Displacement per inch of stroke” (from chart) for the required sleeve sizes.

Divide this total by the number of moving sleeves, then multiply that total by the desired cylinder stroke.

Note: The “Gallons required to extend” does not include the necessary fluid to fill an empty cylinder.

Example: Required fluid to extend a S83DC-40-134 single-acting telescopic cylinder with following stage sizes:

5.75" O.D.= .112

6.75" O.D.= .155

7.90" O.D.= .210

.477

.477 ÷ 3 = .159 gallons per inch of stroke

.159 gallons per inch x 134" of stroke = 21.31 gallons to extend cylinder

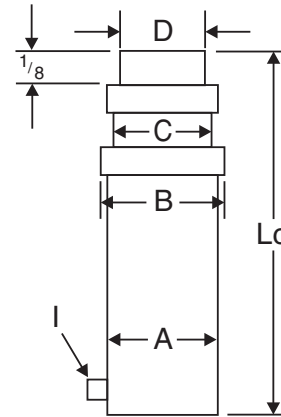
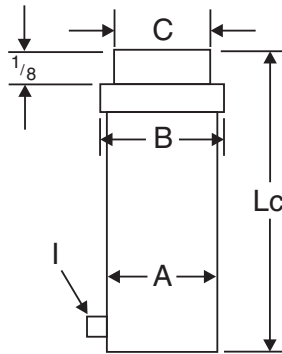
Closed Length Calculations for Single-Acting Single & Multiple Stage Cylinders

* Closed length (Lc) for S Models is computed by one of the three equations below. Model number and stroke required determines which equation to use. Example: To find Lc for S41 cylinder with 68" stroke. Under S41 column, use equation III, because the stroke is over 50".

$$L_c = \text{Stroke} + X_1 + X_2 = 68" + 7.50" + \frac{(68 - 50)}{10} = 68" + 7.50" + (1.8)$$

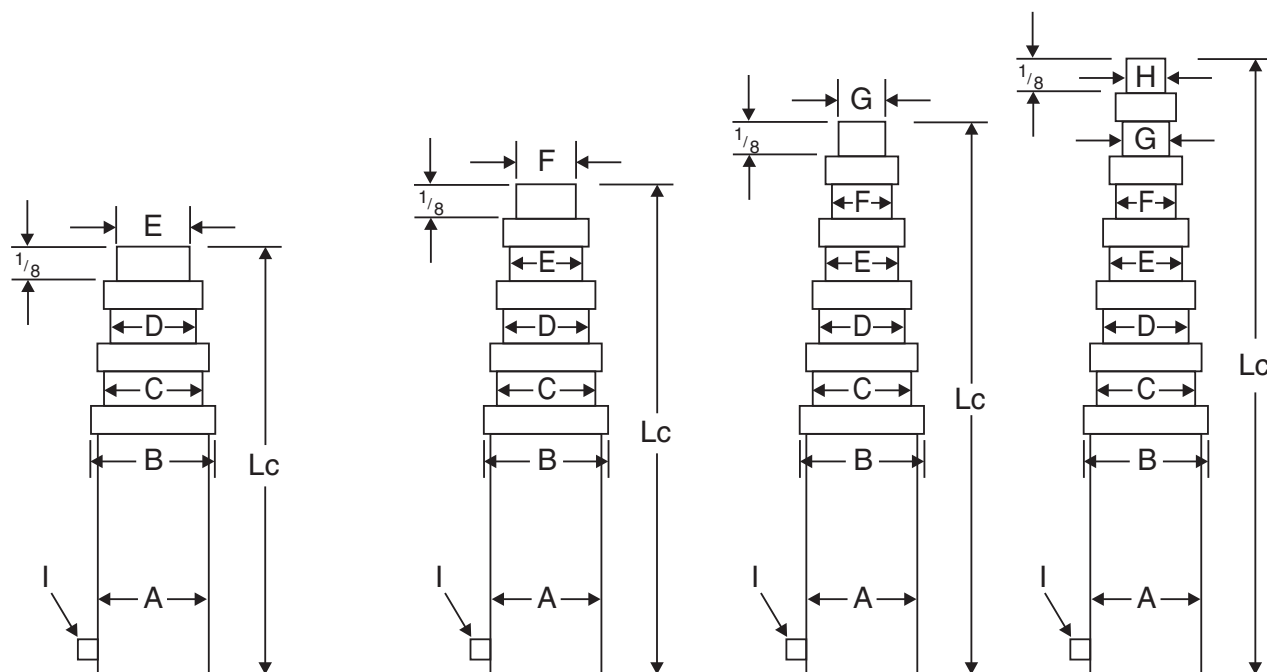
Use next largest whole number. = 68" + 7.50" + 2" = 77.50".

The closed length (Lc) is 77.50". Add Lc 77.50" to the stroke 68" for extended length of 145.50"



	SINGLE STAGE								2 STAGE						
Cylinder Dimensions (inches)		S31	S41	S51	S61	S71	S81	S91		S42	S52	S62	S72	S82	S92
Main Cylinder O.D.	A	3 ³ / ₄	4 ³ / ₄	5 ³ / ₄	6 ³ / ₄	8	9 ¹ / ₈	10 ¹³ / ₁₆	A	4 ³ / ₄	5 ³ / ₄	6 ³ / ₄	8	9 ¹ / ₈	10 ¹³ / ₁₆
Largest Packing Nut O.D.	B	4 ³ / ₈	5 ³ / ₈	6 ³ / ₈	7 ³ / ₈	8 ⁵ / ₈	9 ⁷ / ₈	11 ³ / ₄	B	5 ³ / ₈	6 ³ / ₈	7 ³ / ₈	8 ⁵ / ₈	9 ⁷ / ₈	11 ³ / ₄
1st Sleeve O.D.	C	2 ³ / ₄	3 ³ / ₄	4 ³ / ₄	5 ³ / ₄	6 ³ / ₄	7 ⁷ / ₈	9 ³ / ₈	C	3 ³ / ₄	4 ³ / ₄	5 ³ / ₄	6 ³ / ₄	7 ⁷ / ₈	9 ³ / ₈
2nd Sleeve O.D.	D								D	2 ³ / ₄	3 ³ / ₄	4 ³ / ₄	5 ³ / ₄	6 ³ / ₄	7 ⁷ / ₈
3rd Sleeve O.D.	E								E						
4th Sleeve O.D.	F								F						
5th Sleeve O.D.	G								G						
6th Sleeve O.D.	H								H						
NPT Port	I	³ / ₄	³ / ₄	³ / ₄	1	1	1 ¹ / ₄	1 ¹ / ₄	I	³ / ₄	³ / ₄	1	1	1 ¹ / ₄	1 ¹ / ₄
Max. Stroke at 2000 PSI		71	84	88	95	118	128	190		126	137	138	164	186	265
*To Find Closed Length - Lc	X	5.75	5.75	5.75	6.00	6.00	6.50	6.62	X	6.69	6.69	6.94	6.94	7.44	7.56
Equation I	L _C	Stroke + X up to 35" stroke O.L. = 1 ¹ / ₄ "							L _C	$\frac{\text{Stroke}}{2} + X$ up to 35" stroke O.L. = 1 ¹ / ₄ "					
Equation II	X ₁	7.50	7.50	7.50	7.75	7.75	8.25	8.38	X ₁	8.44	8.44	8.69	8.69	9.19	9.31
	L _C	Stroke + X ₁ 36" to 50" stroke O.L. = 3"							L _C	$\frac{\text{Stroke}}{2} + X_1$ 36" to 50" stroke O.L. = 3"					
Equation III	X ₂	$\frac{\text{Stroke} - 50}{10}$ (To next largest whole number)							X ₂	$\frac{\text{Stroke} - 50}{20}$ (To next largest whole number)					
	L _C	Stroke + X ₁ + X ₂ over 50" stroke O.L. = 3" + X ₂							L _C	$\frac{\text{Stroke}}{2} + X_1 + X_2$ over 50" stroke O.L. = 3" + X ₂					

Closed Length Calculations for Single-Acting Single & Multiple Stage Cylinders



3 STAGE						4 STAGE					5 STAGE				6 STAGE		
	S53	S63	S73	S83	S93		S64	S74	S84	S94		S75	S85	S95		S86	S96
A	5 ³ / ₄	6 ³ / ₄	8	9 ¹ / ₈	10 ¹³ / ₁₆	A	6 ³ / ₄	8	9 ¹ / ₈	10 ¹³ / ₁₆	A	8	9 ¹ / ₈	10 ¹³ / ₁₆	A	9 ¹ / ₈	10 ¹³ / ₁₆
B	6 ³ / ₈	7 ³ / ₈	8 ⁵ / ₈	9 ⁷ / ₈	11 ³ / ₄	B	7 ³ / ₈	8 ⁵ / ₈	9 ⁷ / ₈	11 ³ / ₄	B	8 ⁵ / ₈	9 ⁷ / ₈	11 ³ / ₄	B	9 ⁷ / ₈	11 ³ / ₄
C	4 ³ / ₄	5 ³ / ₄	6 ³ / ₄	7 ⁷ / ₈	9 ³ / ₈	C	5 ³ / ₄	6 ³ / ₄	7 ⁷ / ₈	9 ³ / ₈	C	6 ³ / ₄	7 ⁷ / ₈	9 ³ / ₈	C	7 ⁷ / ₈	9 ³ / ₈
D	3 ³ / ₄	4 ³ / ₄	5 ³ / ₄	6 ³ / ₄	7 ⁷ / ₈	D	4 ³ / ₄	5 ³ / ₄	6 ³ / ₄	7 ⁷ / ₈	D	5 ³ / ₄	6 ³ / ₄	7 ⁷ / ₈	D	6 ³ / ₄	7 ⁷ / ₈
E	2 ³ / ₄	3 ³ / ₄	4 ³ / ₄	5 ³ / ₄	6 ³ / ₄	E	3 ³ / ₄	4 ³ / ₄	5 ³ / ₄	6 ³ / ₄	E	4 ³ / ₄	5 ³ / ₄	6 ³ / ₄	E	5 ³ / ₄	6 ³ / ₄
F						F	2 ³ / ₄	3 ³ / ₄	4 ³ / ₄	5 ³ / ₄	F	3 ³ / ₄	4 ³ / ₄	5 ³ / ₄	F	4 ³ / ₄	5 ³ / ₄
G						G					G	2 ³ / ₄	3 ³ / ₄	4 ³ / ₄	G	3 ³ / ₄	4 ³ / ₄
H						H					H				H	2 ³ / ₄	3 ³ / ₄
I	3 ³ / ₄	1	1	1 ¹ / ₄	1 ¹ / ₄	I	1	1	1 ¹ / ₄	1 ¹ / ₄	I	1	1 ¹ / ₄	1 ¹ / ₄	I	1 ¹ / ₄	1 ¹ / ₄
	181	186	204	224	312		238	262	265	352		335	336	410		T.B.A.	T.B.A.
X	7.62	7.88	7.88	8.38	8.50	X	8.81	8.81	9.31	9.44	X	9.75	10.25	10.38	X	11.19	11.31
L_c	$\frac{\text{Stroke}}{3} + X$ O.L. = 1 ¹ / ₄ " up to 50" stroke					L_c	$\frac{\text{Stroke}}{4} + X$ O.L. = 1 ¹ / ₄ " up to 70" stroke				L_c	$\frac{\text{Stroke}}{5} + X$ O.L. = 1 ¹ / ₄ " up to 85" stroke			L_c	$\frac{\text{Stroke}}{6} + X$ O.L. = 1 ¹ / ₄ " up to 100" stroke	
X_1	9.38	9.62	9.62	10.12	10.25	X_1	10.56	10.56	11.06	11.19	X_1	11.50	12.00	12.12	X_1	12.94	13.06
L_c	$\frac{\text{Stroke}}{3} + X_1$ O.L. = 3" 51" to 75" stroke					L_c	$\frac{\text{Stroke}}{4} + X_1$ O.L. = 3" 71" to 100"				L_c	$\frac{\text{Stroke}}{5} + X_1$ O.L. = 3" 86" to 125" stroke			L_c	$\frac{\text{Stroke}}{6} + X_1$ O.L. = 3" 101" to 150" stroke	
X_2	$\frac{\text{Stroke} - 75}{30}$ (To next largest whole number)					X_2	$\frac{\text{Stroke} - 100}{40}$ (To next largest whole number)				X_2	$\frac{\text{Stroke} - 125}{50}$ (To next largest whole number)			X_2	$\frac{\text{Stroke} - 150}{60}$ (To next largest whole number)	
L_c	$\frac{\text{Stroke}}{3} + X_1 + X_2$ O.L. = 3" + X_2 over 75" stroke					L_c	$\frac{\text{Stroke}}{4} + X_1 + X_2$ O.L. = 3" + X_2 over 100" stroke				L_c	$\frac{\text{Stroke}}{5} + X_1 + X_2$ O.L. = 3" + X_2 over 125" stroke			L_c	$\frac{\text{Stroke}}{6} + X_1 + X_2$ O.L. = 3" + X_2 over 150" stroke	

Safety Precautions for Single-Acting Telescopic Cylinders

WARNING!

Telescopic cylinders commonly installed on dumping vehicles are devices intended to provide only a lifting force. The cylinder is not a structural member, and is not designed for, nor intended to provide stability to the dumping vehicle. Rollover or lateral tilt can cause the cylinder to bend, buldge or separate causing the dump body to drop suddenly, resulting in severe injury or death and/or damage to the unit and cylinder, if the following warnings are not observed.

Hydraulic cylinders are not to be used as a stabilizer on a dump body or dump trailer. The hydraulic cylinder will not prevent the dump body or trailer from rollover or lateral tilt. The cylinder is strictly a lifting device and is not a structural member of the unit. Cylinders are not to be used as a means of stabilizing the unit.

The hydraulic cylinder mounted in the unit should be free to find its own trajectory line of extension, free of any lateral loading of the plungers. Misalignment of the top or bottom mountings, or mounting pins too tight, may cause scoring of the plungers, leaking, or improper sequencing which could cause the unit to upset.

The hydraulic cylinder will not withstand lateral or side pressure when the unit is leaning. Only activate the cylinder when the tractor and trailer are in a straight line (not jack-knifed). A jackknife position of the tractor with the trailer is not recommended when dumping. In a jackknifed position, the upper coupler pivots on bearings, contributing nothing to dump stability. When the tractor and trailer are straight, the coupler bearings are normally 34 inches apart, assisting in stabilizing the dump.

Do not activate the cylinder while on unlevel or soft ground, or during heavy crosswinds. Doing so may cause the unit to upset. Uneven terrain, causing the trailer wheels to be 3 1/2 inches to 4 inches higher than the other side, puts the top of the body 12 inches to 14 inches off center when the cylinder is fully extended. On fresh fill, loaded trailer wheels may sink on one side, again setting up potential tip over. On road construction, the crown is also critical on spread application, as in dumping on a slope. A 4 inch plus, height differential of wheels on an axle 8 feet wide, is another rollover potential. Do not attempt dumping operations in high gusty wind conditions. If possible, raise the dump body directly into the wind.

A blown tire or a severely under inflated tire can cause dump instability, when dumping. Always check tires visually for cuts or punctures by nails and metal. Make sure all tires are inflated properly. Proper tire inflation also improves wear and fuel economy.

Do not activate the cylinder while personnel or equipment are alongside or behind the dump body or trailer.

A hung load is commodity that does not discharge when a dump body is raised to an elevated position. This condition exists due to surface adhesion between the commodity and the interior of the dump body. To avoid a tip over due to a hung load, the driver should be warned by an observer or be aware of the material's moisture content, if this condition exists, immediately lower the dump body.

The operator should stay at the controls during the entire dumping operation. An operator who fails to stay at the controls will never control the body when it starts to lean over for a tip over. If a problem exists, and the body starts to lean, the operator should immediately lower the dump body or trailer and check and remedy any potential problems, then resume dumping the load. It is important to slowly position the cylinder control valve into the hold position to avoid subjecting the cylinder to a high pressure.

Do not overload the unit. The load must be distributed evenly during loading or unloading to avoid rollover and lateral tilt. Loads stuck while the cylinder is partially or completely extended increases the hazard of rollover and lateral tilt. Lower the dump body or trailer entirely with the cylinder control valve partially open (avoid lowering the dump body or trailer with the cylinder control valve completely open). Then unload the dump body or trailer manually or with an alternative mechanical aid.

Overloading is a very common occurrence that aggravates all the above conditions that cause a tip over.

Safety Precautions for Single-Acting Telescopic Cylinders

WARNING!

Shock pressure can cause severe injury or death and/or damage to the unit and cylinder.

Do not use the cylinder to loosen loads stuck in the dump body or trailer. Lower the dump body or trailer entirely with the cylinder control valve partially open (avoid lowering the dump body or trailer with the cylinder control valve completely open). Then unload the dump body or trailer manually or with an alternative mechanical aid.

Humping is a rapid acceleration / deceleration method used to loosen a hung load from a trailer. If the load is off center and the trailer is moved, a tip over may occur. Also, serious damage to the hoist may occur if an extreme humping motion is used to get a sticky load out of the body.

Do not move the truck and jam the brakes while the cylinder is partially or fully extended to loosen loads stuck in the dump body or trailer. Pulling forward (or backing up) and hitting the brakes, or lowering the body part way and then quickly engaging the valve in the "HOLD" or "RAISE" position will cause a tremendous pressure spike. This pressure spike may bulge or split one of the larger stages of the cylinder. Lower the dump body or trailer entirely with the cylinder control valve partially open (avoid lowering the dump body or trailer with the cylinder control valve completely open). Then unload the dump body or trailer manually or with an alternative mechanical aid.

Do not move the truck until the dump body or trailer is lowered completely.

WARNING!

Over pressurizing the cylinder can cause severe injury or death and/or damage to the unit and cylinder.

Do not operate a cylinder at pressures above factory recommended operating pressures (Normally 2,000 P.S.I. unless otherwise approved).

WARNING!

Worn or damaged hydraulic hoses can cause severe injury or death and/or damage to the unit and cylinder.

Hydraulic hoses should be checked regularly and replaced if worn out or damaged.

NOTICE!

Do not drive the unit while the P.T.O. or hydraulic pump is engaged.

The hydraulic oil should be checked and changed regularly to avoid contamination leading to internal cylinder damage.

A damp to light film of oil on each plunger indicates a good cylinder operation. A small accumulation of oil may be noticed on the plunger at the head nuts after many cycles. This should not be mistaken for packing leakage.

Cylinder should be free of entrapped air. It is advisable to bleed air from the cylinder weekly to free entrapped air. This will result in a smoother operation.

The cylinder should float in the pin mountings. The cylinder should be installed with 1/8" to 3/16" of clearance between the pin and the pin hole if the mounting eye is wider than 5", or with 1/16" to 1/8" clearance if the mounting eye is less than 5" wide. There should be a clearance of 1/8" to 1/4" per side on eyes less than 5" wide and 1/4" to 1/2" clearance per side on eyes in excess of 5" wide. This is to allow the body to sway slightly while dumping, without putting a side load on the cylinder. The cylinder plunger or one of the sleeves should be extended a minimum of 1/4" when the dump body is in the down position.

The cylinder end mounts should be lubricated regularly.

Repair Kits

For Standard Parker Single-acting, Dump Body Cylinders.

Parker's genuine replacement parts are available in kits to rebuild or repack our dump body cylinders. These parts are the same as originally installed.

As with all hydraulic repairs, be sure your shop is properly equipped and that the work area is clean.

Rebuilding kits consist of:

- | | |
|------------------------|--------------------|
| 1. Wiper Rings | 5. Piston Bearings |
| 2. Packing Assemblies | 6. Set Screws |
| 3. Gland Bearing Rings | 7. Nylon Balls |
| 4. Wave Springs | |

Repacking kits consist of:

- | | |
|----------------|-----------------------|
| 1. Wiper Rings | 2. Packing Assemblies |
|----------------|-----------------------|

Ordering Information

Please order by part number

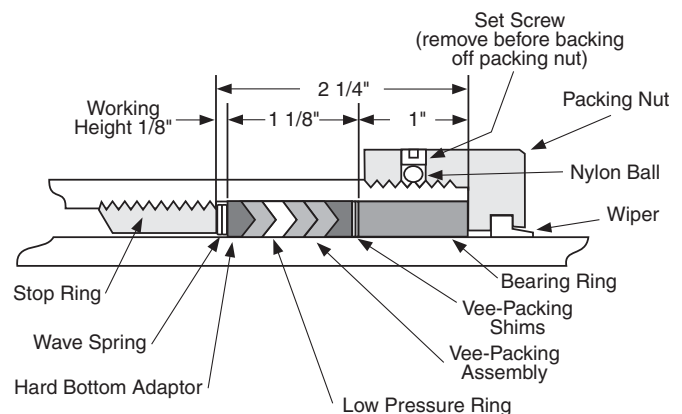
Cylinder Model	Rebuild Kit Number		Repack Kit Number	
S53 Series	A300-253	375-1804-017	A300-11	391-1804-020
S62 Series	A300-256	375-1804-020	A300-262	375-1804-026
S63 Series	A300-254	375-1804-018	A300-104	391-1804-109
S64 Series	A300-257	375-1804-021	A300-230	391-1804-237
S73 Series	A300-255	375-1804-019	A300-238	375-1804-002
S74 Series	A300-258	375-1804-022	A300-239	375-1804-003
S84 Series	A300-259	375-1804-023	A300-49	391-1804-054
S85 Series	A300-260	375-1804-024	A300-22	391-1804-060
S95 Series	A300-261	375-1804-025	A300-240	375-1804-004

The recommended store for a cylinder seal kit is to keep at room temperature and store in a sealed plastic bag protected from light. Shelf life will vary by composite and storage conditions. Properly stored seal kits can have a shelf life from 3 - 7 years.

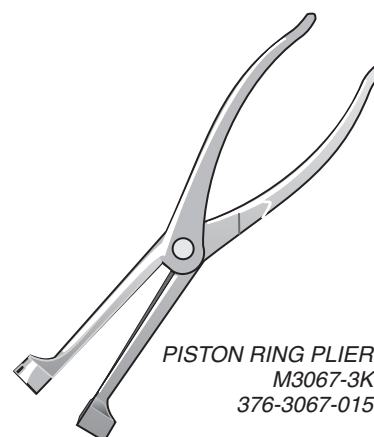
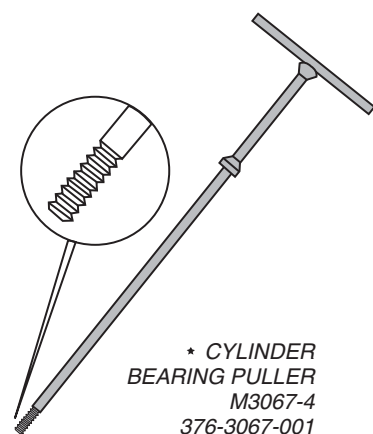
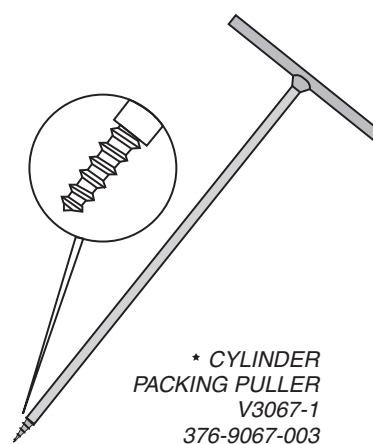
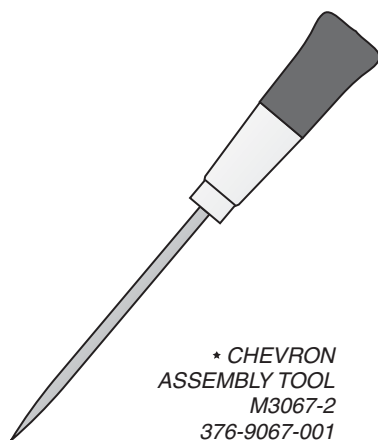
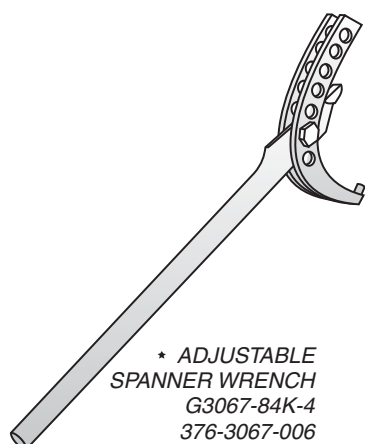
Cylinder Packing Installation

Remove shims from packing set and measure packing height under finger pressure. Add one shim for each 1/32" that the packing measures under 1-1/8". Measure depth to top of stop ring from top of tube. This dimension should be 2-1/4", however, it may vary slightly due to seating of the stop ring. Add one shim to the packing set for every 1/32" that this dimension measures over 2-1/4" or remove one shim from the packing set for every 1/32" that this dimension measures under 2-1/4". Install wave spring with gap edge against top of the cylinder stop ring. Soak packing in hydraulic oil for a few minutes. (Check bottom adaptor. Only hard type can be used with the wave spring). Install packing, one ring at a time, in the proper sequence as shown in the sketch. Note: The soft, low pressure ring must be in the second position from the pressure side. Installed packing height need not be checked because wave spring will vary this

dimension. Installation of bearing and packing nut will compress wave spring for proper packing pre-load. Pull down tight against tube.

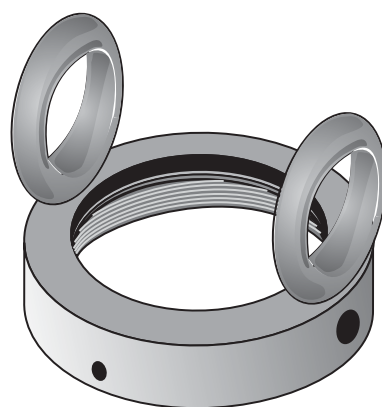


Hydraulic Cylinder Required Service Tools



Tools Required

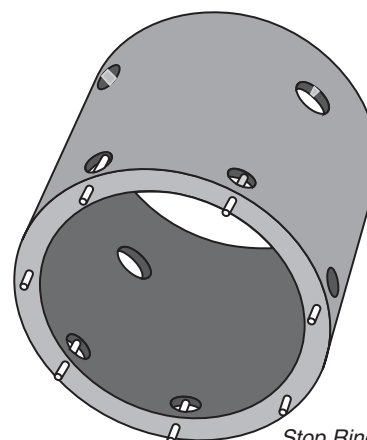
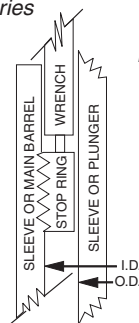
Proper tools make the job of servicing cylinders easier and faster and reduce the possibility of damaging the finely machined surfaces. We recommend that you have the tools shown on this page prior to attempting service on Commercial telescopic cylinders. Tools with an * are required for all cylinders regardless of size. Lifting rings and stop ring wrenches must be ordered to fit the specific sleeve in the cylinder.



Lifting Ring
BC3067 Series

Sleeve or
Main O.D. Eng # , Part Number

3 3/4"	BC3067-1, 376-3067-008
4 3/4"	BC3067-2, 376-3067-009
5 3/4"	BC3067-3, 376-3067-010
6 3/4"	BC3067-4, 376-3067-011
7 7/8"	BC3067-5, 376-3067-012
9 3/8"	BC3067-6, 376-3067-013
11 1/8"	BC3067-7, 376-3067-014



Stop Ring Wrench
BA3067 Series

Sleeve or
Main I.D. Plunger O.D. Eng # , Part Number

3 1/4"	2 3/4"	BA3067-1, 376-6067-047
4 1/4"	3 3/4"	BA3067-2, 376-6067-048
5 1/4"	4 3/4"	BA3067-3, 376-6067-049
6 1/4"	5 3/4"	BA3067-4, 376-6067-050
7 1/4"	6 3/4"	BA3067-5, 376-6067-051
8 7/16"	7 7/8"	BA3067-6, 376-6067-052
9 7/8"	9 3/8"	BA3067-7, 376-6067-053

Normal Maintenance Items

Packing, wipers and bushings are considered normal maintenance or service items. These items are subject to contamination from external and internal foreign materials, many of which are abrasive in nature, causing abnormal wear or damage to the parts, to the extent that replacements are required.

WARNING!!

Before working on a telescopic cylinder mounted on a truck or trailer unit, use supports or holding devices that will absolutely prevent the body from accidentally lowering. Place control valve in the “Lower” position to assure that all pressure has been relieved from the cylinder.

Because of our self-compensating Packing design, Standard Commercial Hydraulics Cylinders require no packing adjustment. For Commercial Packing Assembly Installation Procedure see Service Repair Kit Page.

Procedure for Adjusting Telescopic Cylinder Head Nuts. (For Cylinder designs using no Wave Springs and/or no U-Seals)

1. Loosen set screw (or set screws) in head nut that holds in packing of leaking stage.
2. Lightly tap head nut around circumference with a hammer.
3. Back head nut off 1/2 to 1 full turn using a spanner or chain wrench.
(Note: If stage rotates when head nut is turned, hold stage with a strap wrench.)
4. Cycle cylinder 2 to 3 times to reset chevron vee packing.
5. Retighten head nut approximately 1/2 turn further than it was when it was loosened.
6. Tighten set screws.

Procedure for Mis-Staging or Mis-Sequencing Cylinder.

1. Loosen set screws in head nut that holds in packing which fits over stage that is sticking.
2. Lightly tap head nut around circumference with a hammer.
3. Back head nut off 1/2 turn using a spanner or chain wrench.
4. Cycle cylinder, if cylinder still mis-stages, back head nut off another 1/2 turn.
5. Cycle cylinder, if cylinder still mis-stages, tighten the head nut of the next stage that is extending.
6. Tighten set screws.

Bleeding Air from Single-Acting Telescopic Cylinders.

For smooth operation of these cylinders, it is advisable to bleed the air from the cylinder weekly.

Manual bleeding is accomplished by:

1. Empty the dump body of any material.
2. Remove the cover plate from the dog house of the dump body to access the bleeder valve.
3. Fully extend the cylinder, raising the EMPTY dump bed.
4. Lower the dump to within 1 foot from resting on the frame.
5. With the fingers, turn the bleeder valve in a counterclockwise direction. This opens the valve and allows the air to escape from the cylinder.
6. When a steady stream of oil comes from the bleeder, turn the valve in a clockwise direction until it is closed.

**If these procedures fail to correct the problem, please contact an
Authorized Service Center for Instructions.**

Hydraulic Oil Recommendations

All cylinder parts, with the exception of a few items, are lubricated by the hydraulic oil in the circuit. Particular attention must be paid to keep the oil in the circuit clean. Whenever there is a hydraulic component failure (cylinder, pump, valve), and there is a reason to feel that metal particles may be in the system, the oil must be drained, the entire system flushed clean, and any filter screens thoroughly cleaned or replaced. New oil should be supplied for the entire system. Oil suitable and recommended for use in circuits involving Commercial cylinders should meet the following specifications:

***These suggestions are intended as a guide only.
Obtain your final oil recommendations from your oil supplier.***

Viscosity Recommendations:

Optimum operating viscosity is considered to be about 100 SSU.

- * 50 SSU minimum @ operating temperature
7500 SSU maximum @ starting temperature
- * 150 to 225 SSU @ 100° F. (37.8° C.) (generally)
44 to 48 SSU @ 210° F. (98.9° C.) (generally)

Other Desirable Properties:

Viscosity Index: 90 minimum
Aniline point: 175 minimum

Additives Usually Recommended:

Rust and Oxidation (R & O) Inhibitors
Foam Depressant

Other Desirable Characteristics:

Stability of physical and chemical characteristics.
High demulsibility (low emulsibility) for separation of water, air and contaminants.
Resistant to the formation of gums, sludges, acids, tars and varnishes.
High lubricity and film strength.

General Recommendations:

A good quality hydraulic oil conforming to the characteristics listed above is essential to the satisfactory performance and long life of any hydraulic system.

Oil should be changed on regular schedules in accordance with the manufactures recommendations and the system periodically flushed.

Oil operating temperature should not exceed 200° F. (93° C.) with a maximum of 180° F. (82° C.) generally recommended. 120° F. to 140° F. (50° C. to 60° C.) is generally considered optimum. High temperatures result in rapid oil deterioration and may point out a need for an oil cooler or a larger reservoir. The nearer to optimum temperature, the longer the service life of the oil and the hydraulic components.

Reservoir size should be large enough to hold and cool all the fluid a system will need, yet it should not be wastefully large. Minimum required capacity can vary anywhere between 1 and 3 times pump output. The reservoir must be able to hold all of the fluid displaced by retracted cylinders when the system is not operating, yet provide space for expansion and foaming.

Oil poured into the reservoir should pass through a 100 mesh screen. Pour only clean oil from clean containers into the reservoir.

Never use Crank Case Drainings, Kerosene, Fuel Oil, or any Non-Lubricating Fluid, such as Water.

Approximate SSU at . . .

Oil Grade	100° F. (37.8° C.)	210° F. (98.9° C.)
SAE 10	150	43
SAE 20	330	51

Normal Temperatures:

0° F. (-18° C.) to 100° F. (37.8° C.) ambient
100° F. (37.8° C.) to 180° F. (82.2° C.) system

Be sure the oil you use is recommended for the temperature you expect to encounter.

1) Function Test

Once the Cylinder is placed on the test stand and hydraulic lines attached, the cylinder will be cycled its full stroke a minimum of three (3) full cycles.

The cylinder will be rejected if it functions erratically. Erratic function is excessive chatter, slapstrick, stalling and uncorrectable misstaging.

2) Proof Pressure Test

After the function test is performed the cylinder will be extended fully and pressure held for a minimum of thirty (30) seconds. This pressure will be 2500 psi or a pressure indicated on the assembly print. The cylinder will be rejected for external leakage or structural deformation. If the cylinder is double acting, it will be fully retracted and pressure held for a minimum of thirty (30) seconds. The pressure will be 2500 psi or a pressure indicated on the assembly print. The cylinder will be rejected for external leakage or structural deformation.

3) Internal Bypass Test

This test will be performed on all double acting cylinders and can be done in conjunction with the Proof Pressure Test. The cylinder will be fully extended and pressure held at 2500 psi. The retract line will be removed and piston seal bypass will be determined by the flow out of this cylinder port. Excessive bypass will be a cause for cylinder rejection. The cylinder will be fully retracted and pressure held at 2500 psi. The extend line will be removed and the piston bypass will be determined by the flow out of this cylinder port. The cylinder will be rejected for excessive flow. When making this test the hydraulic line should be completely removed from the cylinder port, and the open line from the valve should be plugged or capped since a slight back pressure in the tank return line would spill oil from the line if not plugged.

Pass/Fail criteria if not noted on Assembly drawing is as follows:

Cast Iron Rings Normal Maximum leakage 1 GPM.

Bypass = 1/2 cubic inch per inch of bore diameter per minute.

Extend bypass would be 1/2 cubic inch per inch of plunger piston ring OD per minute.

Retract bypass would be 1/2 cubic inch per inch of piston ring OD per minute of each stage added together.

Example SD73 Series;

Extend bypass; $1/2 \times 5.25 = 2.62$ cubic in / min.

Retract bypass; $(1/2 \times 7.25) + (1/2 \times 6.25) + (1/2 \times 5.25) = 9.38$ cubic in / min.

Soft Seals Maximum leakage 5 drops per minute.

Please Note

Before Installing a New Cylinder in an old application

Has the problem been corrected that caused the original cylinder to fail?

Is the hydraulic fluid clean of all contamination, water, and entrapped air?

Are the hydraulic system relief valve pressures set and operating properly?

Is the mechanism or unit the cylinder is operating in good mechanical condition?

Storage and Installation

STORAGE

It pays to keep spare hydraulic cylinders on hand for use when you need them. But, you must know and follow these recommended storage practices or the cylinders can be ruined. Hydraulic cylinders, though often large and unwieldy, are precision machines with finely finished parts and close tolerances. And they're expensive. So handle them with care.

For optimum storage life, hydraulic cylinders should be kept in an environment that is protected from excessive moisture and temperature extremes. A hot, dry desert climate with cold nights, for example, must be accommodated when choosing the storage area. Daytime heat quickly bakes oil out of sealing materials, which causes leaks and rapid wear when the cylinder is placed in service. Cooling at night causes water condensation and corrosion damage to wear surfaces. Storage areas that allow exposure to rain, snow and extreme cold must likewise be avoided.

It's best to store cylinders indoors if possible. But indoors or out, be sure that plugs or closures are properly installed in all ports to keep out moisture and dirt. However, overtightening of port plugs should be avoided. Widely varying temperatures and tightly closed ports may cause pressure inside the cylinder to build up to the point where the piston moves far enough to expose the rod to corrosion or contamination. Try to choose a storage location where the cylinders are protected from physical damage. Even a little ding from a falling bar or forklift tine can cause trouble later.

Cylinders, Particularly large ones, should be stored closed in a vertical position with the rod end down. Be sure they're blocked securely to keep them from toppling. Storing with the rod ends down keeps oil on the seals, which protects them from drying out. This is more critical with fabric and butyl seals than with urethane sealing materials. Storing single-acting cylinders with the rod end up can cause port closures to pop open and leak, exposing the sleeves to corrosion damage and contamination. Storing with the rod end down also discourages the temptation to lift a cylinder by the rod eye – a dangerous practice. If horizontal storage cannot be avoided, the rod or cylinder should be rolled into a new position every two months or so to prevent drying, distortion and deterioration of the seals. Don't forget that a cylinder can be a major source of contamination. A small scratch or nick on the sleeve will quickly shred packing and contaminate the system. Store cylinders carefully and keep them clean.

The following procedures should be followed in order to prevent oxidation and maintain the surfaces of a mounted hydraulic cylinder during idle periods. These idle periods may include; inventory units, demo units, out of service units, etc.

- All machined surfaces left exposed should be coated with a light film of grease, if not oxidation will occur.
- If oxidation is present, apply a light coat of oil to the surfaces.
- Buff surfaces with 320 or 400 grit sandpaper. Do not buff surfaces up and down the length, buff only around the circumference.
- If after buffing, the surfaces show evidence of oxidation damage i.e., pitting, the cylinder should be inspected by an authorized service center for evaluation.
- Operation of a hydraulic cylinder with surface damage will shorten the longevity and preclude any warranty express or implied.

INSTALLATION

- Cleanliness is an important consideration, and Parker cylinders are shipped with the ports plugged to protect them from contaminants entering the ports. These plugs should not be removed until the piping is to be installed. Before making the connection to the cylinder ports, the piping should be thoroughly cleaned to remove all chips or burrs which might have resulted from threading or flaring operations. One small foreign particle can cause premature failure of the cylinder or other hydraulic system components. If oxidation is present, apply a light coat of oil to the surfaces.
- Proper alignment of the cylinder piston rod and its mating component on the machine should be checked in both the extended and retracted positions. Improper alignment will result in excessive rod gland and/or cylinder bore wear.
- Cylinders operating in an environment where air drying material are present such as fast-drying chemicals, paint, or welding splatter, or other hazardous conditions such as excessive heat, should have shields installed to prevent damage to the piston rod and piston rod seals.

Front Mount Dump Body Stroke & Lifting Calculations

Note: This guide is for use to determine approximate stroke and lifting requirements for a Front Mount Dump Body, they should not be used for Frameless Type Trailers, Underbody, Telescopic Farm (slant forward or rearward), or Scissor Type Hoists. Final dimensions and calculations should be determined by an engineering drawing.

Formula for Calculating Initial Required
Cylinder Force to Lift a Load

$$\frac{\text{Load (lbs)} \times "A"}{"B"} = \text{Initial required cylinder force}$$

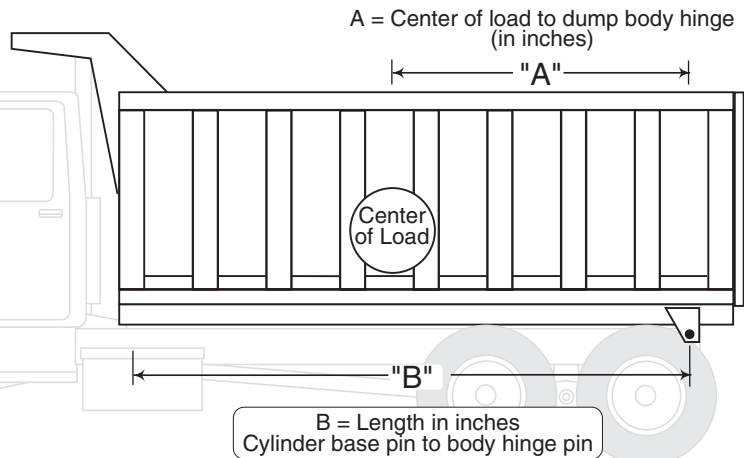
Example

$$\frac{50,000\# \times 85"}{166"} = 25,603\# \text{ of force to start the lift}$$

Commercial Telescopic Lifting Capacities

Stage O.D. in inches	System operating pressure			
	800 psi	1000 psi	1500 psi	2000 psi
2.75"	4752	5940	8909	11879
3.75"	8836	11045	16567	22089
4.75"	14176	17721	26581	35441
5.75"	20774	25967	38951	51935
6.75"	28628	35785	53677	71570
7.90"	39213	49017	73525	98034
9.37"	55165	68956	103434	137911

Note: For a good design, initial pressure should not exceed 800 psi at start of lift. Effective force (capacity) is only that of the sleeve / stage which is moving and will decrease as cylinder changes to the next moving sleeve. The effective force will also be reduced if the



Formula for Calculating the Required
Cylinder Stroke for a Dump Angle

$$"B" \times "D" = \text{Approximate Stroke}$$

Example

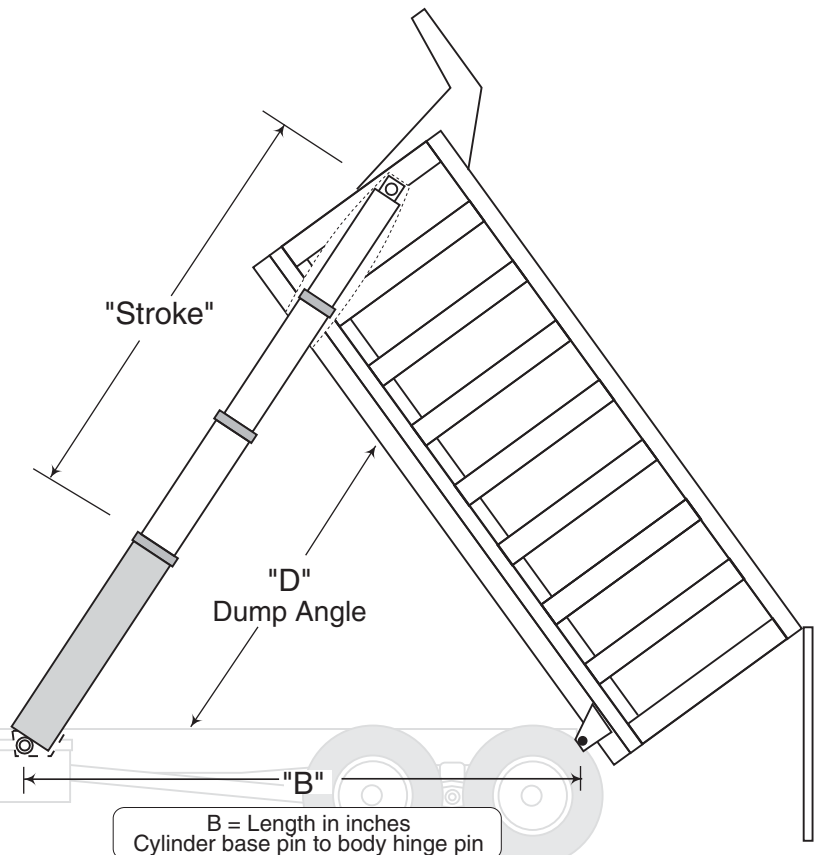
$$166" (B) \times .845 (D) = 140" \text{ Stroke}$$

Dump Angle Multipliers

"D" = Dump Angle

.715	=	42 deg
.733	=	43 deg
.750	=	44 deg
.765	=	45 deg
.780	=	46 deg
.797	=	47 deg
.813	=	48 deg
.830	=	49 deg
.845	=	50 deg
.861	=	51 deg
.877	=	52 deg
.892	=	53 deg
.903	=	54 deg
.923	=	55 deg
.939	=	56 deg
.954	=	57 deg

Normal minimum dump angle is 45 degree
Normal maximum dump angle is 57 degree



Commodities & Materials Approximate Weights

Approximate Weights of Materials					
Material	lbs. / cu. yd.	tons / cu. yd.	Material	lbs. / cu. yd.	tons / cu. yd.
Andesite stone	4887	2.44	Earth & sand, wet	3240	1.62
Ashes	1080	0.52	Fire Brick	3915	1.95
Asphalt	2700	1.35	Fire Clay	3510	1.75
Asphaltum	2349	1.17	Garbage	1150	0.57
Basalt rock	4887	2.44	Gravel, dry	2970	1.48
Brick, soft clay	2718	1.35	Gravel, out of water	1620	0.81
Brick, hard clay	3397	1.69	Granite	4536	2.26
Brick, pressed	3806	1.9	Lime, quick, loose	1431	0.71
Brick, paving	4246	2.12	Lime, quick, shaken	1485	0.70
Block, paving	3694	1.84	Limestone, solid	4536	2.26
Bluestone	2970	1.48	Limestone, loose	2592	1.29
Cement, natural	1512	0.75	Marble, solid	4455	2.22
Cement, Portland	2430	1.21	Marble, loose	2592	1.29
Cement, Portland, set	4941	2.47	Mortar, set	2781	1.39
Cement, Rosendale	1863	0.93	Mud, dry	2430	1.21
Cinders	1080	0.54	Mud, packed	3105	1.55
Clay, dry	1701	0.85	Mud, wet	2916	1.45
Clay, wet	2970	1.48	Pitch	1863	0.93
Clay & gravel, dry	2700	1.35	Plaster of Paris	2646	1.32
Coal, anthracite	1536	0.76	Powder, blasting	1682	0.84
Coal, bituminous	1275	0.64	Quartz	4374	2.18
Coke	837	0.42	Rubbish	199.8	0.09
Concrete, cinders	2970	1.48	Sand, dry, loose	2619	1.30
Concrete, gravel	4104	2.05	Sand, wet	3186	1.59
Concrete, limestone	4050	2.02	Sandstone	4023	2.01
Concrete, sandstone	3915	1.95	Slag, bank	1890	0.94
Concrete, trap rock	4185	2.09	Slag, screenings	2700	1.35
Crushed stone	2700	1.35	Slag, machine	2592	1.29
Earth, dry, loose	1890	0.94	Slag, sand	1485	0.74
Earth, damp, loose	2106	1.05	Shale	4374	2.18
Earth, damp packed	2592	1.29	Slate	4725	2.31
Earth & gravel, dry	2700	1.35	Tar	1674	0.83
Earth & gravel, wet	3240	1.62	Tile	2970	1.43
Earth & sand, dry	2709	1.35	Trap stone	5849	2.52

Steel & Aluminum Gauge, Thickness and Weight

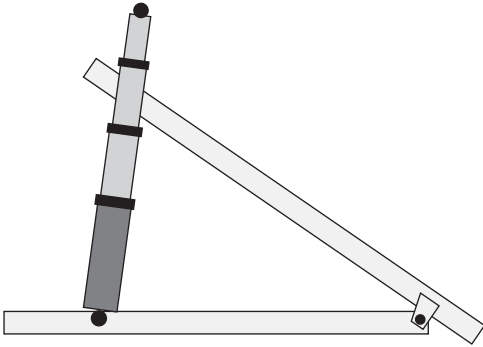
Steel

3/8"	0.375	15.320 lbs. per sq. ft.
1/4" (approx. 3 Ga.)	0.250	10.200 lbs. per sq. ft.
3/16" (approx. 7 Ga.)	0.188	7.650 lbs. per sq. ft.
8 Ga.	0.164	6.875 lbs. per sq. ft.
9 Ga.	0.149	6.250 lbs. per sq. ft.
10 Ga.	0.134	5.625 lbs. per sq. ft.
11 Ga.	0.120	5.000 lbs. per sq. ft.
12 Ga.	0.105	4.375 lbs. per sq. ft.
13 Ga.	0.090	3.750 lbs. per sq. ft.
14 Ga.	0.075	3.125 lbs. per sq. ft.

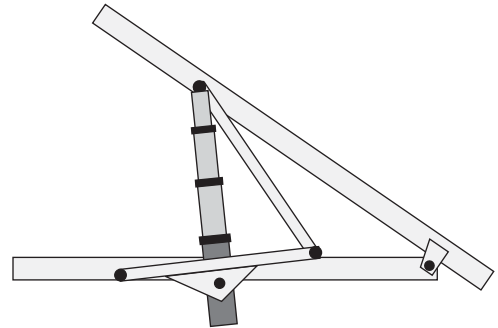
Aluminum

3/8"	0.375	5.18 lbs. per sq. ft.
1/4"	0.250	3.53 lbs. per sq. ft.
3/16"	0.188	2.65 lbs. per sq. ft.
5/32"	0.156	2.25 lbs. per sq. ft.

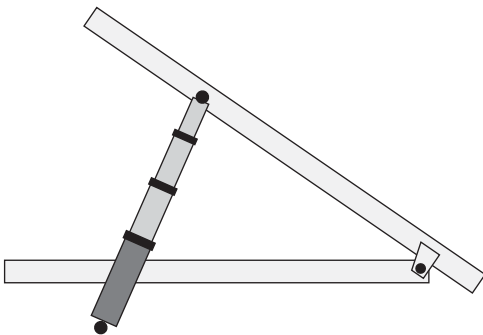
Dump Hoist Type Identification Chart



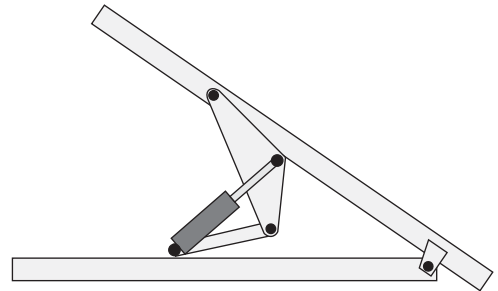
FRONT MOUNT TELESCOPIC
HEAD LIFT OR BOTTOM LIFT



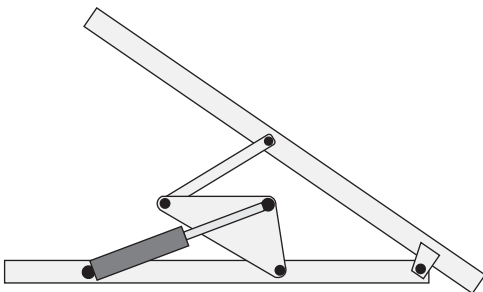
TELESCOPIC SCISSOR
HINGE FORWARD OR REARWARD



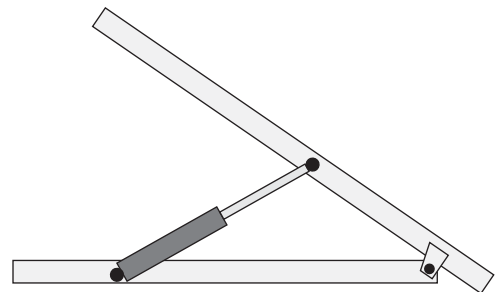
UNDERBODY TELESCOPIC
SLANT FORWARD OR SLANT REARWARD



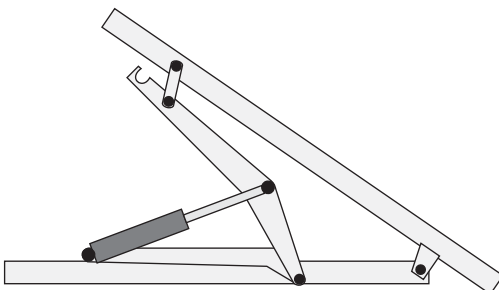
SINGLE STAGE SCISSOR



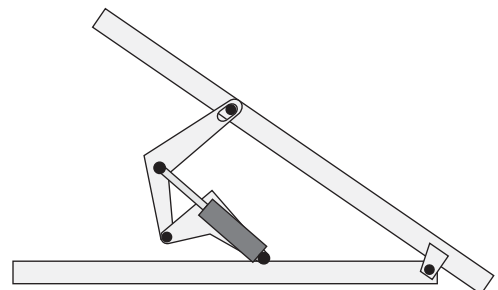
UNDER BODY ARM HOIST



UNDER BODY DIRECT LIFT



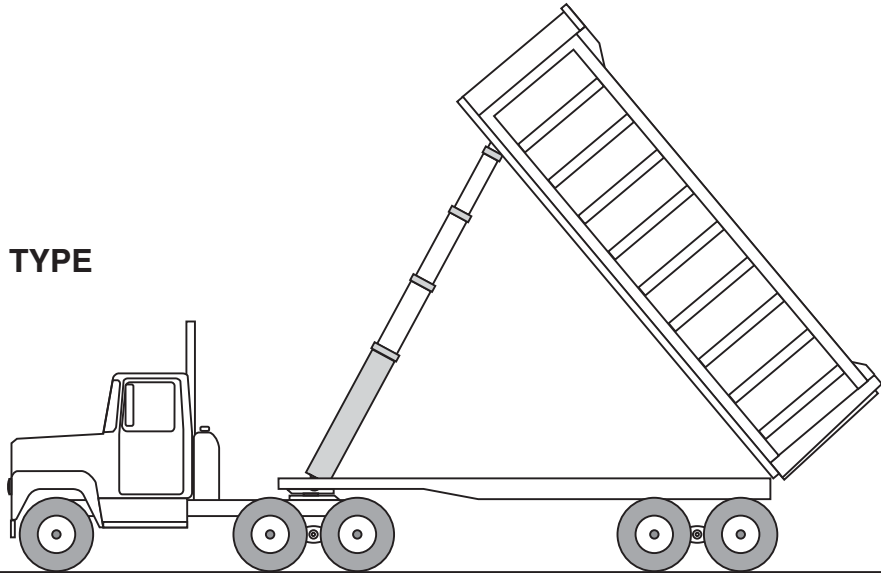
UNDER BODY ARM - SCISSOR



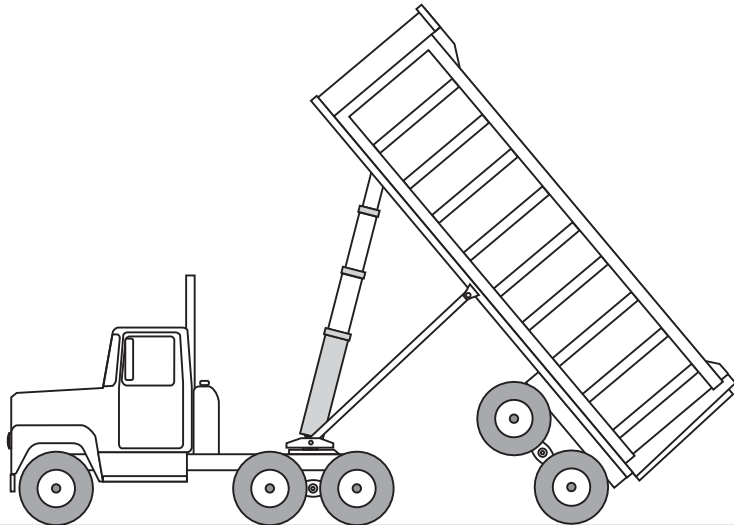
LOST MOTION SCISSOR

Dump Trailer Type Identification Chart

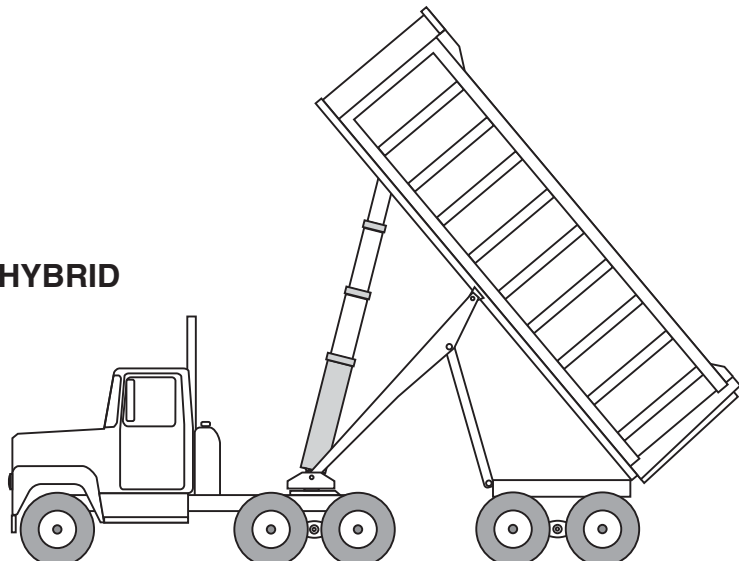
FRAME TYPE



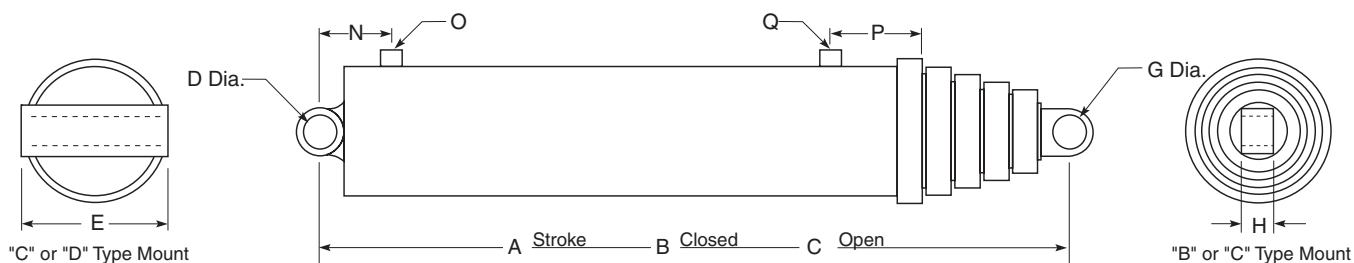
FRAMELESS



FRAMELESS HYBRID



Single-Acting Telescopic Cylinders With CC, DB, and DC Mounts Design

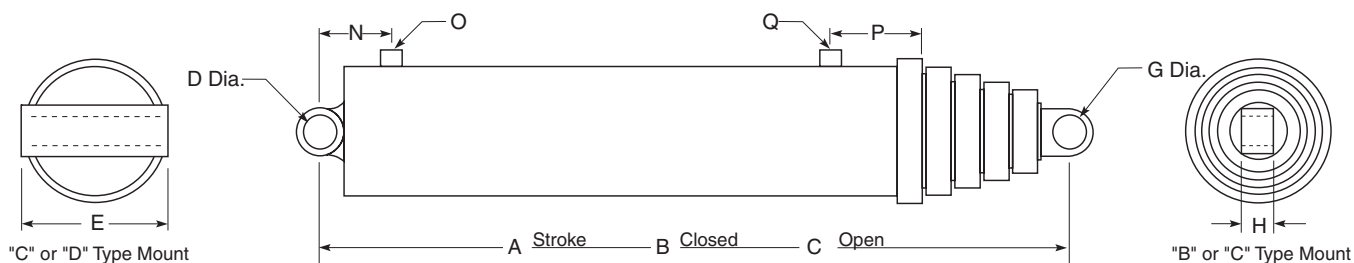


ENGINEERING NUMBER	10 DIGIT NUMBER	NOMINAL STAGE OD	NUMBER STAGES	A STROKE	B CLOSED	C OPEN	D PIN	E WIDTH	G PIN	H WIDTH
S42CC-19-40	3771012052	4	2	40.00	32.44	72.44	1.50	2.00	1.50	2.00
S43DB-3-75	3781013005	4	3	75.00	33.88	108.88	2.00	5.00	1.25	1.69
S52CC-41-54.62	3771512092	5	2	54.62	38.00	92.62	2.50	3.62	2.50	3.62
S52CC-41-67.25	3771512091	5	2	67.25	46.81	114.06	2.50	3.62	2.50	3.62
S52DB-9-67.50	3771512080	5	2	67.50	46.75	114.25	3.00	5.50	2.00	3.00
S53DB-13-60	3781513005	5	3	60.00	30.00	90.00	2.00	6.00	1.50	2.63
S53DB-18-90	3781513008	5	3	90.00	39.75	129.75	2.00	6.00	1.50	2.63
S53DC-65-104	3771513168	5	3	104.00	47.69	151.69	2.00	7.00	1.75	2.00
S53DC-65-107	3771513169	5	3	107.56	48.38	155.94	2.00	7.00	1.75	2.00
S53DC-65-120	3771513166	5	3	120.13	53.06	173.19	2.00	7.00	1.75	2.00
S53DC-65-126	3771513170	5	3	126.63	54.56	181.19	2.00	7.00	1.75	2.00
S53DC-66-72	3771513172	5	3	72.00	37.19	109.19	2.00	7.00	1.63	1.50
S53DC-66-84	3771513171	5	3	84.00	41.19	125.19	2.00	7.00	1.63	1.50
S53DC-68-105	3771513176	5	3	105.00	48.50	153.50	2.00	7.75	1.75	1.50
S53DC-68-120	3771513177	5	3	120.00	52.50	172.50	2.00	7.75	1.75	1.50
S53DC-68-123	3771513178	5	3	123.00	54.50	177.50	2.00	7.75	1.75	1.50
S53DC-68-99	3771513175	5	3	99.00	46.50	145.50	2.00	7.75	1.75	1.50
S63DC-101-104	3771413319	6	3	103.94	47.00	150.94	2.00	7.00	2.00	2.00
S63DC-101-107	3771413320	6	3	107.56	48.38	155.94	2.00	7.00	2.00	2.00
S63DC-101-120	3771413321	6	3	120.06	52.62	172.68	2.00	7.00	2.00	2.00
S63DC-101-126	3771413322	6	3	126.31	54.56	180.87	2.00	7.00	2.00	2.00
S63DC-101-140	3771413324	6	3	140.25	59.81	200.06	2.00	7.00	2.00	2.00
S63DC-101-150	3771413318	6	3	149.88	63.00	212.88	2.00	7.00	2.00	2.00
S63DC-101-86	3771413316	6	3	86.75	40.88	127.63	2.00	7.00	2.00	2.00
S63DC-101-92	3771413317	6	3	92.00	45.00	137.00	2.00	7.00	2.00	2.00
S63DC-102-120	3771413325	6	3	120.00	53.50	173.50	2.38	8.00	2.19	1.50
S63DC-102-126	3771413326	6	3	126.00	55.50	181.50	2.38	8.00	2.19	1.50
S63DC-102-138	3771413327	6	3	138.00	59.50	197.50	2.38	8.00	2.19	1.50
S63DC-102-150	3771413328	6	3	150.00	66.00	216.00	2.38	8.00	2.19	1.50
S63DC-102-162	3771413329	6	3	162.00	67.50	229.50	2.38	8.00	2.19	1.50
S63DC-79-67	3771413260	5	3	67.00	36.50	103.50	3.00	7.88	1.75	1.50
S63DC-96-130	3771413308	6	3	130.00	56.00	186.00	2.00	7.00	2.00	2.00
S63DC-96-82.50	3771413306	6	3	82.50	43.56	126.06	2.00	7.00	2.00	2.00
S63DC-97-111	3771413309	6	3	111.00	49.94	160.94	2.00	7.00	2.00	2.00
S63DC-97-123	3771413310	6	3	123.00	54.94	177.94	2.00	7.00	2.00	2.00

Note; Diameters D and G are for nominal pin size, for actual hole size refer to print.

Note; Nominal Stage OD, refers to the Largest Moving Sleeve.

Single-Acting Telescopic Cylinders With CC, DB, and DC Mounts

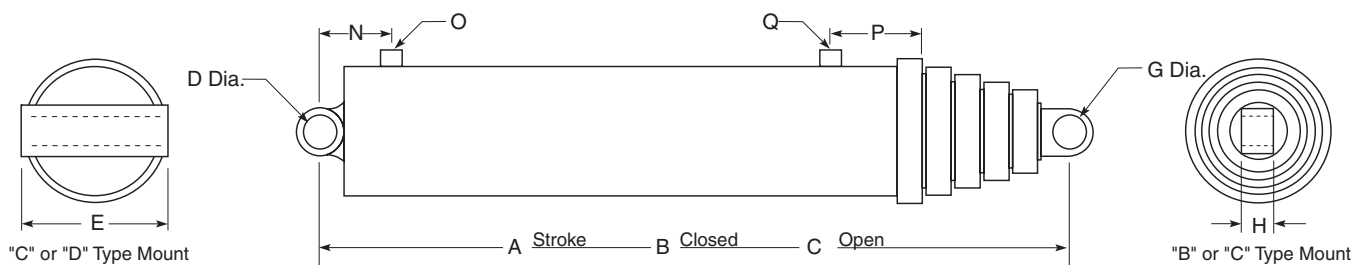


10 DIGIT NUMBER	N LOCATION	O SIZE	P LOCATION	Q SIZE	GALS TO FILL	GALS TO EXTEND	WEIGHT LBS	REBUILD KIT	REPACK KIT
3771012052	14"	1/2" NPT			2.07	2.46	52	3751805175	3751805174
3781013005			19"	1/2" NPT	0.77	2.11	85	3751805720	3751804368
3771512092	3.88"	#8 SAE			2	3.4	120	3751805581	3751805580
3771512091	3.88"	#8 SAE			2.51	4.17	145	3751805581	3751805580
3771512080	20"	#12 SAE			2.42	4.2	135	3751805581	3751805580
3781513005			19"	1/2" NPT	1.7	3	120	3751804017	3911804020
3781513008			19"	3/4" NPT	1.22	4.45	200	3751804017	3911804020
3771513168			15.50"	1" NPT	2.4	5.89	175	3751804017	3911804020
3771513169			9.94"	1" NPT	2.4	5.89	178	3751804017	3911804020
3771513166			15.50"	1" NPT	2.42	5.9	195	3751804017	3911804020
3771513170			16.12"	1" NPT	2.42	5.9	205	3751804017	3911804020
3771513172	19.50"	3/4" NPT			1.8	3.5	165	3751804017	3911804020
3771513171	19.50"	3/4" NPT			1.8	3.5	170	3751804017	3911804020
3771513176	24.81"	#16 90D SAE			2	5.2	170	3751804017	3911804020
3771513177	24.81"	#16 90D SAE			1.62	5.9	220	3751804017	3911804020
3771513178	24.81"	#16 90D SAE			2.8	6.1	232	3751804017	3911804020
3771513175	24.81"	#16 90D SAE			1.95	4.87	165	3751804017	3911804020
3771413319	20.81"	1" NPT			1.75	8.05	250	3751804018	3911804109
3771413320	20.81"	1" NPT			1.82	8.37	256	3751804018	3911804109
3771413321	20.81"	1" NPT			2.03	9.33	275	3751804018	3911804109
3771413322	20.81"	1" NPT			2.13	9.84	285	3751804018	3911804109
3771413324	20.81"	1" NPT			2.37	10.94	310	3751804018	3911804109
3771413318	20.81"	1" NPT			2.53	11.71	325	3751804018	3911804109
3771413316	20.81"	1" NPT			1.47	6.79	225	3751804018	3911804109
3771413317	20.81"	1" NPT			1.56	7.14	195	3751804018	3911804109
3771413325	24.91"	#16 90D SAE			2.02	9.4	270	3751804018	3911804109
3771413326	24.91"	#16 90D SAE			2.13	9.9	275	3751804018	3911804109
3771413327	24.91"	#16 90D SAE			2.33	11.1	300	3751804018	3911804109
3771413328	24.91"	#16 90D SAE			2.54	11.9	330	3751804018	3911804109
3771413329	24.91"	#16 90D SAE			2.75	12.64	330	3751804018	3911804109
3771413260	20.50"	3/4" NPT			2.18	5.12	180	3751805654	3751805594
3771413308	20.81"	1" 90D NPT			2.15	10.85	295	3751804018	3911804109
3771413306	20.81"	1" 90D NPT			2.15	10.85	230	3751804018	3911804109
3771413309	3.81"	1" NPT	24"	1" NPT	1.87	8.61	270	3751804018	3911804109
3771413310	3.81"	1" NPT	29"	1" NPT	2.08	9.63	285	3751804018	3911804109

Note; Diameters D and G are for nominal pin size, for actual hole size refer to print.

Note; Nominal Stage OD, refers to the Largest Moving Sleeve.

Single-Acting Telescopic Cylinders With CC, DB, and DC Mounts

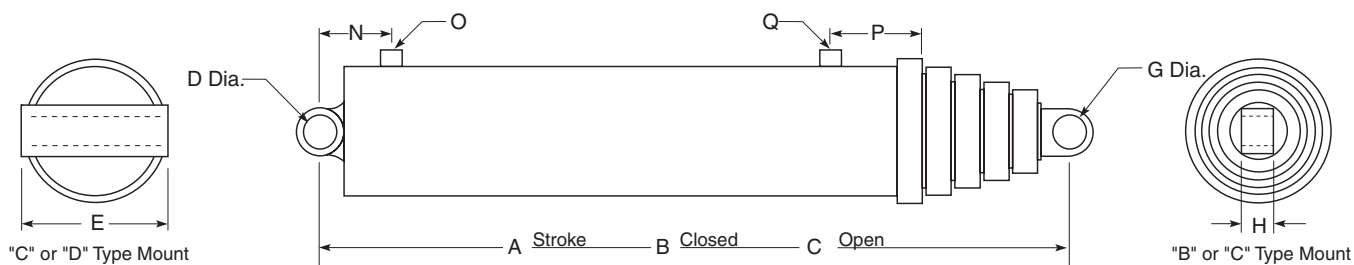


ENGINEERING NUMBER	10 DIGIT NUMBER	NOMINAL STAGE OD	NUMBER STAGES	A STROKE	B CLOSED	C OPEN	D PIN	E WIDTH	G PIN	H WIDTH
S64DB-12-135	3771414058	6	4	135.00	47.19	182.19	1.75	8.00	1.50	2.69
S64DB-12-156	3771414056	6	4	156.00	53.19	209.19	1.75	8.00	1.50	2.69
S64DC-14-156	3771414059	6	4	156.00	53.62	209.62	2.00	7.25	2.00	1.75
S64DC-15-157	3771414061	6	4	157.00	58.56	215.56	1.50	7.00	1.50	2.00
S73DC-66-110	3772513127	7	3	110.63	50.06	160.69	2.00	8.25	2.00	2.00
S73DC-66-120	3772513132	7	3	120.00	53.12	173.12	2.00	8.25	2.00	2.00
S73DC-66-124	3772513128	7	3	124.88	54.81	179.69	2.00	8.25	2.00	2.00
S73DC-66-129	3772513135	7	3	129.00	56.50	185.50	2.00	8.25	2.00	2.00
S73DC-66-140	3772513129	7	3	140.44	60.00	200.44	2.00	8.25	2.00	2.00
S73DC-66-150	3772513131	7	3	150.00	63.50	213.50	2.00	8.25	2.00	2.00
S74DC-74-120	3772514124	7	4	120.00	44.12	164.12	2.00	8.25	2.00	2.00
S74DC-74-135	3772514125	7	4	135.00	48.44	183.44	2.00	8.25	2.00	2.00
S74DC-74-140	3772514122	7	4	140.00	49.75	189.75	2.00	8.25	2.00	2.00
S74DC-74-156	3772514123	7	4	156.00	53.75	209.75	2.00	8.25	2.00	2.00
S74DC-74-161	3772514120	7	4	161.75	55.31	217.06	2.00	8.25	2.00	2.00
S74DC-74-180	3772514126	7	4	180.00	61.12	241.12	2.00	8.25	2.00	2.00
S84DC-40-170	3772914050	8	4	170.00	57.25	227.25	2.00	9.50	2.00	2.00
S84DC-66-140	3772914080	8	4	140.00	49.75	189.75	2.00	9.50	2.00	2.00
S84DC-66-148	3772914081	8	4	147.75	51.50	199.25	2.00	9.50	2.00	2.00
S84DC-66-156	3772914086	8	4	156.00	53.75	209.75	2.00	9.50	2.00	2.00
S84DC-66-161	3772914082	8	4	160.00	55.75	215.75	2.00	9.50	2.00	2.00
S84DC-66-170	3772914083	8	4	170.00	57.25	227.25	2.00	9.50	2.00	2.00
S84DC-66-180	3772914084	8	4	180.00	59.75	239.75	2.00	9.50	2.00	2.00
S84DC-66-188	3772914085	8	4	188.00	61.75	249.75	2.00	9.50	2.00	2.00
S85DC-66-170	3772915164	8	5	170.00	49.88	219.88	2.00	9.50	2.00	2.00
S85DC-66-190	3772915166	8	5	189.00	54.62	243.62	2.00	9.50	2.00	2.00
S85DC-66-197	3772915162	8	5	196.13	55.25	251.38	2.00	9.50	2.00	2.00
S85DC-66-220	3772915167	8	5	219.00	60.00	279.00	2.00	9.50	2.00	2.00
S85DC-66-235	3772915161	8	5	234.00	64.62	298.62	2.00	9.50	2.00	2.00
S85DC-66-250	3772915160	8	5	249.00	68.62	317.62	2.00	9.50	2.00	2.00
S85DC-66-265	3772915165	8	5	265.00	71.00	336.00	2.00	9.50	2.00	2.00
S85DC-66-285	3772915163	8	5	285.00	78.50	363.50	2.00	9.50	2.00	2.00

Note; Diameters D and G are for nominal pin size, for actual hole size refer to print.

Note; Nominal Stage OD, refers to the Largest Moving Sleeve.

Single-Acting Telescopic Cylinders With CC, DB, and DC Mounts

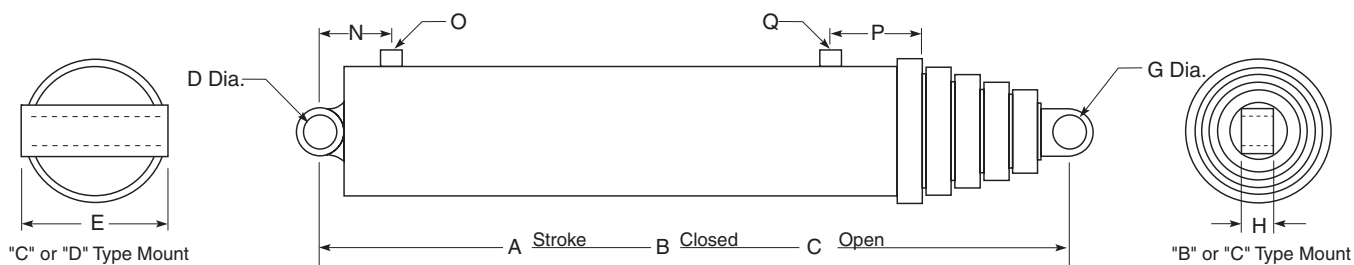


10 DIGIT NUMBER	N LOCATION	O SIZE	P LOCATION	Q SIZE	GALS TO FILL	GALS TO EXTEND	WEIGHT LBS	REBUILD KIT	REPACK KIT
3771414058			5.50"	2, 3/4" NPT	2.6	8.1	275	3751804021	3911804237
3771414056			5.50"	2, 3/4" NPT	3.2	10.1	293	3751804021	3911804237
3771414059	6.31"	1" NPT			2.5	10.01	310	3751804021	3911804237
3771414061	4.31"	1" NPT			3.8	9.5	310	3751804021	3911804237
3772513127	7.06"	1" NPT	4.62"	1" NPT	2.34	12.6	335	3751804019	3751804002
3772513132	7.06"	1" NPT	4.62"	1" NPT	2.4	13.5	360	3751804019	3751804002
3772513128	7.06"	1" NPT	4.62"	1" NPT	2.53	14.2	370	3751804019	3751804002
3772513135	8.56"	1" NPT	4.62"	1" NPT	2.6	14.7	385	3751804019	3751804002
3772513129	7.06"	1" NPT	4.62"	1" NPT	2.84	16.1	400	3751804019	3751804002
3772513131	7.06"	1" NPT	4.62"	1" NPT	3.1	17.1	420	3751804019	3751804002
3772514124	7.06"	1" NPT	4.62"	1" NPT	2.2	11.5	325	3751804022	3751804003
3772514125	7.06"	1" NPT	4.62"	1" NPT	2.5	13	375	3751804022	3751804003
3772514122	7.06"	1" NPT	4.62"	1" NPT	2.6	13.5	365	3751804022	3751804003
3772514123	7.06"	1" NPT	4.62"	1" NPT	2.9	15.1	388	3751804022	3751804003
3772514120	7.06"	1" NPT	4.62"	1" NPT	4.48	15.5	405	3751804022	3751804003
3772514126	7.06"	1" NPT	4.62"	1" NPT	3.5	17.4	430	3751804022	3751804003
3772914050	6.50"	1" NPT	5.62"	1" NPT	7.6	23.3	570	3751804023	3911804054
3772914080	6.50"	1" NPT	5.62"	1" NPT	3	19.1	488	3751804023	3911804054
3772914081	6.50"	1" NPT	5.62"	1" NPT	3.2	20.2	515	3751804023	3911804054
3772914086	5.56"	1" NPT	5.62"	1" NPT	3.4	21.3	535	3751804023	3911804054
3772914082	6.50"	1" NPT	5.62"	1" NPT	3.5	22	555	3751804023	3911804054
3772914083	6.50"	1" NPT	5.62"	1" NPT	3.7	23.4	568	3751804023	3911804054
3772914084	6.50"	1" NPT	5.62"	1" NPT	3.9	24.7	591	3751804023	3911804054
3772914085	6.50"	1" NPT	5.62"	1" NPT	4.1	25.8	610	3751804023	3911804054
3772915164	6.50"	1" NPT	5.62"	1" NPT	3.4	20	516	3751804024	3911804060
3772915166	6.50"	1" NPT	5.62"	1" NPT	3.8	22.3	555	3751804024	3911804060
3772915162	6.50"	1" NPT	5.62"	1" NPT	3.9	23.1	560	3751804024	3911804060
3772915167	6.50"	1" NPT	5.62"	1" NPT	4.4	25.9	565	3751804024	3911804060
3772915161	6.50"	1" NPT	5.62"	1" NPT	4.7	27.7	650	3751804024	3911804060
3772915160	6.50"	1" NPT	5.62"	1" NPT	5	29.5	685	3751804024	3911804060
3772915165	6.50"	1" NPT	5.62"	1" NPT	5.3	31.5	715	3751804024	3911804060
3772915163	6.50"	1" NPT	5.62"	1" NPT	5.7	34	795	3751804024	3911804060

Note; Diameters D and G are for nominal pin size, for actual hole size refer to print.

Note; Nominal Stage OD, refers to the Largest Moving Sleeve.

Single-Acting Telescopic Cylinders With CC, DB, and DC Mounts

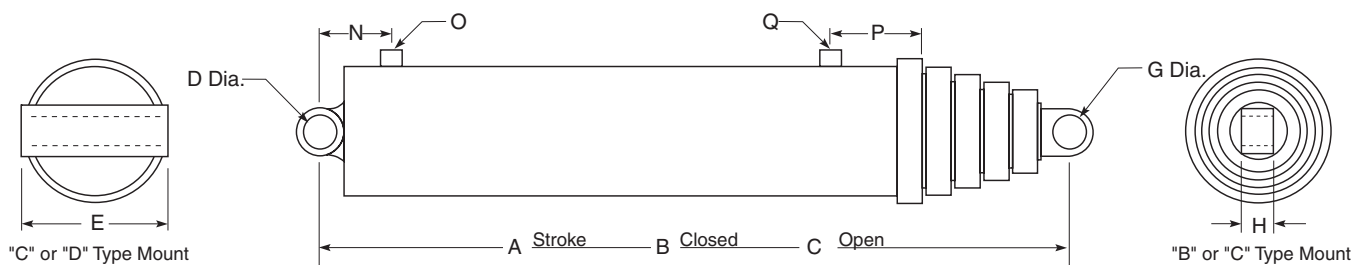


ENGINEERING NUMBER	10 DIGIT NUMBER	NOMINAL STAGE OD	NUMBER STAGES	A STROKE	B CLOSED	C OPEN	D PIN	E WIDTH	G PIN	H WIDTH
S95DC-52-190	3773115068	9	5	190.00	56.00	246.00	2.00	10.88	2.00	2.00
S95DC-52-220	3773115064	9	5	218.00	62.44	280.44	2.00	10.88	2.00	2.00
S95DC-52-235	3773115063	9	5	233.00	65.44	298.44	2.00	10.88	2.00	2.00
S95DC-52-250	3773115061	9	5	248.00	68.44	316.44	2.00	10.88	2.00	2.00
S95DC-52-265	3773115069	9	5	265.00	72.62	337.62	2.00	10.88	2.00	2.00
S95DC-52-280	3773115067	9	5	280.00	78.62	358.62	2.00	10.88	2.00	2.00
S95DC-52-300	3773115066	9	5	300.00	79.00	379.00	2.00	10.88	2.00	2.00
S95DC-52-320	3773115065	9	5	320.00	83.00	403.00	2.00	10.88	2.00	2.00
S95DC-52-340	3773115062	9	5	340.00	87.00	427.00	2.00	10.88	2.00	2.00

Note; Diameters D and G are for nominal pin size, for actual hole size refer to print.

Note; Nominal Stage OD, refers to the Largest Moving Sleeve.

Single-Acting Telescopic Cylinders With CC, DB, and DC Mounts

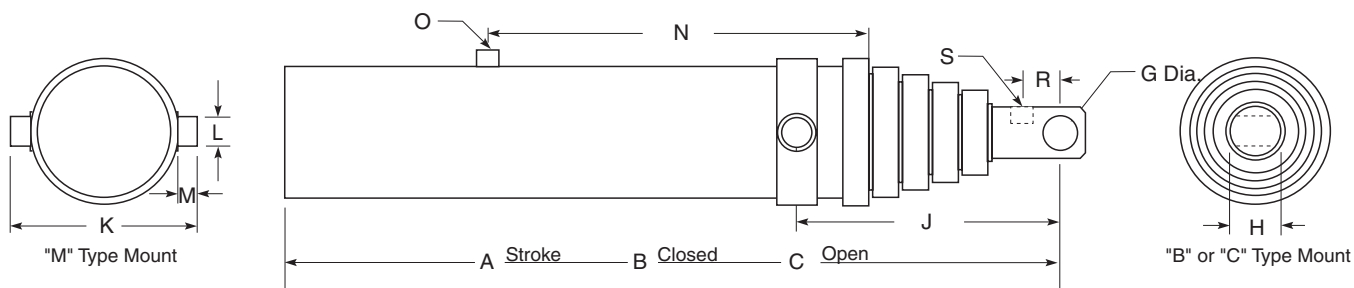


10 DIGIT NUMBER	N LOCATION	O SIZE	P LOCATION	Q SIZE	GALS TO FILL	GALS TO EXTEND	WEIGHT LBS	REBUILD KIT	REPACK KIT
3773115068	6.50"	1" NPT	5.75"	1" NPT	3.9	22.4	835	3751804025	3751804004
3773115064	6.50"	1" NPT	5.75"	1" NPT	6.8	36.2	855	3751804025	3751804004
3773115063	6.50"	1" NPT	5.75"	1" NPT	7.1	38.7	880	3751804025	3751804004
3773115061	6.50"	1" NPT	5.75"	1" NPT	7.5	41.3	1100	3751804025	3751804004
3773115069	6.50"	1" NPT	5.75"	1" NPT	8.2	44.6	1200	3751804025	3751804004
3773115067	6.50"	1" NPT	5.75"	1" NPT	9.3	47.6	1215	3751804025	3751804004
3773115066	6.50"	1" NPT	5.75"	1" NPT	9.6	50.2	1230	3751804025	3751804004
3773115065	6.50"	1" NPT	5.75"	1" NPT	9.8	54.1	1200	3751804025	3751804004
3773115062	12.50"	1" NPT	5.75"	1" NPT	10.2	59.9	1245	3751804025	3751804004

Note; Diameters D and G are for nominal pin size, for actual hole size refer to print.

Note; Nominal Stage OD, refers to the Largest Moving Sleeve.

Single-Acting Telescopic Cylinders With MB and MC Mounts



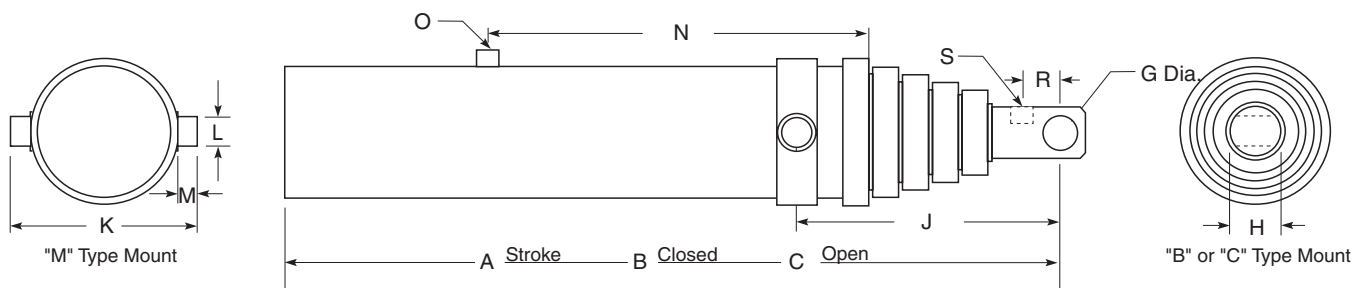
ENGINEERING NUMBER	10 DIGIT NUMBER	NOMINAL STAGE OD	NUMBER STAGES	A STROKE	B CLOSED	C OPEN	G PIN	H WIDTH	J TR to PIN	K WIDTH	L DIA.	M LGTH
S63MB-8-140	3771413124	6	3	140.25	61.62	201.9	1.5	3.62	14.37	12.38	1.8	1.69
S74MB-3-154	3772514058	7	4	154	55.62	209.6	1.5	3.62	14.37	12.25	1.8	1.63
S74MB-3-172	3772514062	7	4	172	58.34	230.3	1.5	3.62	14.37	12.25	1.8	1.63
S85MC-48-200	3772915121	8	5	199	55	254	2	3	15.5	14	2.3	1.25
S85MC-48-220	3772915122	8	5	219	59	278	2	3	15.5	14	2.3	1.25
S85MC-48-235	3772915123	8	5	234	65	299	2	3	15.5	14	2.3	1.25
S85MC-48-250	3772915120	8	5	249	67	316	2	3	15.5	14	2.3	1.25
S85MC-48-265	3772915119	8	5	265	71	336	2	3	15.5	14	2.3	1.25
S85MC-48-280	3772915118	8	5	280	78.87	358.9	2	3	15.5	14	2.3	1.25

Note; Bold / Highlighted Items are Standard Warehouse Items.

Note; Diameters G are for nominal pin size, for actual hole size refer to print.

Note; Nominal Stage OD, refers to the Largest Moving Sleeve.

Single-Acting Telescopic Cylinders With MB and MC Mounts



10 DIGIT NUMBER	N LOCATION	O SIZE	R LOCATION	S SIZE	GALS TO FILL	GALS TO EXTEND	WEIGHT LBS	REBUILD KIT	REPACK KIT
3771413124			2"	1" NPT	4.8	11.2	280	3751804018	3911804109
3772514058			2"	1" NPT	5.2	15.1	412	3751804022	3751804003
3772514062			2"	1" NPT	5.6	16.6	436	3751804022	3751804003
3772915121			2"	1" NPT	6.4	23.5	620	3751804024	3911804060
3772915122			2"	1" NPT	7.1	26.1	640	3751804024	3911804060
3772915123			2"	1" NPT	7.8	27.2	670	3751804024	3911804060
3772915120			2"	1" NPT	8.4	29.1	720	3751804024	3911804060
3772915119			2"	1" NPT	8.7	31.6	780	3751804024	3911804060
3772915118			2"	1" NPT	9.8	34.1	800	3751804024	3911804060

Note; Bold / Highlighted Items are Standard Warehouse Items.

Note; Diameters G are for nominal pin size, for actual hole size refer to print.

Note; Nominal Stage OD, refers to the Largest Moving Sleeve.

Parker Safety Guide for Selecting and Using Hydraulic Cylinders and Their Accessories

WARNING:  FAILURE OR IMPROPER SELECTION OR IMPROPER USE OF CYLINDERS AND THEIR RELATED ACCESSORIES CAN CAUSE DEATH, PERSONAL INJURY AND PROPERTY DAMAGE.

Before selecting or using Parker cylinders or related accessories, it is important that you read, understand and follow the following safety information.

User Responsibility

Due to very wide variety of cylinder applications and cylinder operating conditions, Parker does not warrant that any particular cylinder is suitable for any specific application. This safety guide does not analyze all technical parameters that must be considered in selecting a product. The hydraulic and pneumatic cylinders outlined in this catalog are designed to Parker's design guide lines and do not necessarily meet the design guide lines of other agencies such as American Bureau of Shipping, ASME Pressure Vessel Code etc. The user, through its own analysis and testing, is solely responsible for:

- Making the final selection of the cylinders and related accessories.
- Determining if the cylinders are required to meet specific design requirements as required by the Agency(s) or industry standards covering the design of the user's equipment.
- Assuring that the user's requirements are met, OSHA requirements are met, and safety guidelines from the applicable agencies such as but not limited to ANSI are followed and that the use presents no health or safety hazards.
- Providing all appropriate health and safety warnings on the equipment on which the cylinders are used.

Seals

The seals for the product lines shown in this catalogue are intended for mineral base hydraulic fluids and for the operating temperatures ranges as indicated. The operation of these products with other fluids or at other operating temperatures must be brought to the attention of our engineering department so that proper seals for intended operation may be selected.

The application of cylinders may allow fluids such as cutting fluids, wash down fluids etc. to come in contact with the external area of the cylinder. These fluids may attack the piston rod wiper and or the primary seal and must be taken into account when selecting and specifying seal compounds.

Dynamic seals will wear. The rate of wear will depend on many operating factors. Wear can be rapid if a cylinder is mis-aligned or if the cylinder has been improperly serviced. The user must take seal wear into consideration in the application of cylinders.

Piston Rods

Possible consequences of piston rod failure or separation of the piston rod from the piston include, but are not limited to are:

- Piston rod and or attached load thrown off at high speed.
- High velocity fluid discharge.
- Piston rod extending when pressure is applied in the piston retract mode.

Piston rods or machine members attached to the piston rod may move suddenly and without warning as a consequence of other conditions occurring to the machine such as, but not limited to:

- Unexpected detachment of the machine member from the piston rod.
- Failure of the pressurized fluid delivery system (hoses, fittings, valves, pumps, compressors) which maintain cylinder position.
- Catastrophic cylinder seal failure leading to sudden loss of pressurized fluid.
- Failure of the machine control system.

Part of selecting cylinders for a specific operation involves the proper selection of the piston rod diameter. This catalogue contains informa-

tion in the selection of piston rod diameter, which must be followed in order to avoid possible buckling.

Piston rods are not normally designed to absorb bending moments or loads which are perpendicular to the axis of piston rod motion. These additional loads can cause the piston rod to fail. If these types of additional loads are expected to be imposed on the piston rod, their magnitude should be made known to our engineering department.

The cylinder user should always make sure that the piston rod is securely attached to the machine member.

Cushions

Cushions are devices internal to the cylinder to slow the piston and rod assembly down at the end of the stroke. It is suggested they be used to reduce piston impact at the end of the cylinder stroke when the cylinder is expected to move at relatively high velocity.

Cylinder cushions are normally designed to absorb the energy of a linear applied load. A rotating mass has considerably more energy than the same mass moving in a linear mode. Cushioning for a rotating mass application should be review by our engineering department.

Cylinder Mountings

Some cylinder mounting configurations may have certain limitations such as but not limited to minimum stroke for side or foot mounting cylinders or pressure de-ratings for certain flange mounts. Carefully review the catalog for these types of restrictions.

Always mount cylinders using the largest possible high tensile alloy steel socket head cap screws that can fit in the cylinder mounting holes and torque them to the manufacturer's recommendations for their size.

Port Fittings

Hydraulic cylinders applied with meter out or deceleration circuits are subject to intensified pressure at piston rod end.

The rod end pressure is approximately equal to:

$$\frac{\text{operating pressure} \times \text{effective cap end area}}{\text{effective rod end piston area}}$$

Contact your connector supplier for the pressure rating of individual connectors.

Cylinder Modifications or Repairs

Cylinders as shipped from the factory are not to be disassembled and or modified. If cylinders require modifications, these modifications must be done at Parker locations or by Parker certified facilities. The Mobile Cylinder Division Engineering Department must be notified in the event of a mechanical fracture or permanent deformation of any cylinder component (excluding seals). This includes a broken piston rod, mounting accessory or any other cylinder component. This notification should include all operation and application details. This information will be used to provide an engineered repair that will prevent recurrence of the failure. It is allowed to disassemble cylinders for the purpose of replacing seals or seal assemblies.

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The items described in this document and other documents and descriptions provided by Parker Hannifin Corporation, its subsidiaries and its authorized distributors ("Seller") are hereby offered for sale at prices to be established by Seller. This offer and its acceptance by any customer ("Buyer") shall be governed by all of the following Terms and Conditions. Buyer's order for any item described in its document, when communicated to Seller verbally, or in writing, shall constitute acceptance of this offer. All goods or work described will be referred to as "Products".

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5. **Claims; Commencement of Actions.** Buyer shall promptly inspect all Products upon delivery. No claims for shortages will be allowed unless reported to the Seller within 10 days of delivery. No other claims against Seller will be allowed unless asserted in writing within 60 days after delivery or, in the case of an alleged breach of warranty, within 30 days after the date within the warranty period on which the defect is or should have been discovered by Buyer. Any action based upon breach of this agreement or upon any other claim arising out of this sale (other than an action by Seller for any amount due to Seller from Buyer) must be commenced within thirteen months from the date of tender of delivery by Seller or, for a cause of action based upon an alleged breach of warranty, within thirteen months from the date within the warranty period on which the defect is or should have been discovered by Buyer.
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10. **Special Tooling.** A tooling charge may be imposed for any special tooling, including without limitation, dies, fixtures, molds and patterns, acquired to manufacture Products. Such special tooling shall be and remain Seller's property notwithstanding payment of any charges by Buyer. In no event will Buyer acquire any interest in apparatus belonging to Seller which is utilized in the manufacture of the Products, even if such apparatus has been specially converted or adapted for such manufacture and notwithstanding any charges paid by Buyer. Unless otherwise agreed, Seller shall have the right to alter, discard or otherwise dispose of any special tooling or other property in its sole discretion at any time.
11. **Buyer's Obligation; Rights of Seller.** To secure payment of all sums due or otherwise, Seller shall retain a security interest in the goods delivered and this agreement shall be deemed a Security Agreement under the Uniform Commercial Code. Buyer authorizes Seller as its attorney to execute and file on Buyer's behalf all documents Seller deems necessary to perfect its security interest. Seller shall have a security interest in, and lien upon, any property of Buyer in Seller's possession as security for the payment of any amounts owed to Seller by Buyer.
12. **Improper use and Indemnity.** Buyer shall indemnify, defend, and hold Seller harmless from any claim, liability, damages, lawsuits, and costs (including attorney fees), whether for personal injury, property damage, patent, trademark or copyright infringement or any other claim, brought by or incurred by Buyer, Buyer's employees, or any other person, arising out of: (a) improper selection, improper application or other misuse of Products purchased by Buyer from Seller; (b) any act or omission, negligent or otherwise, of Buyer; (c) Seller's use of patterns, plans, drawings, or specifications furnished by Buyer to manufacture Product; or (d) Buyer's failure to comply with these terms and conditions. Seller shall not indemnify Buyer under any circumstance except as otherwise provided.
13. **Cancellations and Changes.** Orders shall not be subject to cancellation or change by Buyer for any reason, except with Seller's written consent and upon terms that will indemnify, defend and hold Seller harmless against all direct, incidental and consequential loss or damage. Seller may change product features, specifications, designs and availability with notice to Buyer.
14. **Limitation on Assignment.** Buyer may not assign its rights or obligations under this agreement without the prior written consent of Seller.
15. **Entire Agreement.** This agreement contains the entire agreement between the Buyer and Seller and constitutes the final, complete and exclusive expression of the terms of the agreement. All prior or contemporaneous written or oral agreements or negotiations with respect to the subject matter are herein merged.
16. **Waiver and Severability.** Failure to enforce any provision of this agreement will not waive that provision nor will any such failure prejudice Seller's right to enforce that provision in the future. Invalidation of any provision of this agreement by legislation or other rule of law shall not invalidate any other provision herein. The remaining provisions of this agreement will remain in full force and effect.
17. **Termination.** This agreement may be terminated by Seller for any reason and at any time by giving Buyer thirty (30) days written notice of termination. In addition, Seller may by written notice immediately terminate this agreement for the following: (a) Buyer commits a breach of any provision of this agreement (b) the appointment of a trustee, receiver or custodian for all or any part of Buyer's property (c) the filing of a petition for relief in bankruptcy of the other Party on its own behalf, or by a third party (d) an assignment for the benefit of creditors, or (e) the dissolution or liquidation of the Buyer.
18. **Governing Law.** This agreement and the sale and delivery of all Products hereunder shall be deemed to have taken place in and shall be governed and construed in accordance with the laws of the State of Ohio, as applicable to contracts executed and wholly performed therein and without regard to conflicts of laws principles. Buyer irrevocably agrees and consents to the exclusive jurisdiction and venue of the courts of Cuyahoga County, Ohio with respect to any dispute, controversy or claim arising out of or relating to this agreement. Disputes between the parties shall not be settled by arbitration unless, after a dispute has arisen, both parties expressly agree in writing to arbitrate the dispute.
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This image shows a full page of blank graph paper. The grid consists of thin, light gray horizontal and vertical lines that intersect to form small squares across the entire surface. There are no margins, text, or other markings on the paper.



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Parker Hannifin Corporation

About Parker Hannifin Corporation

Parker Hannifin is a leading global motion-control company dedicated to delivering premier customer service. A Fortune 500 corporation listed on the New York Stock Exchange (PH), our components and systems comprise over 1,400 product lines that control motion in some 1,000 industrial and aerospace markets. Parker is the only manufacturer to offer its customers a choice of hydraulic, pneumatic, and electromechanical motion-control solutions. Our Company has the largest distribution network in its field, with over 7,500 distributors serving nearly 400,000 customers worldwide.

Parker's Charter

To be a leading worldwide manufacturer of components and systems for the builders and users of durable goods. More specifically, we will design, market and manufacture products controlling motion, flow and pressure. We will achieve profitable growth through premier customer service.

Product Information

North American customers seeking product information, the location of a nearby distributor, or repair services will receive prompt attention by calling the Parker Product Information Center at our toll-free number: 1-800-C-PARKER (1-800-272-7537). In Europe, call 00800-C-PARKER-H (00800-2727-5374).

The Aerospace Group

is a leader in the development, design, manufacture and servicing of control systems and components for aerospace and related high-technology markets, while achieving growth through premier customer service.



The Climate & Industrial Controls Group

designs, manufactures and markets system-control and fluid-handling components and systems to refrigeration, air-conditioning and industrial customers worldwide.



The Fluid Connectors Group

designs, manufactures and markets rigid and flexible connectors, and associated products used in pneumatic and fluid systems.



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designs, produces and markets a full spectrum of hydraulic components and systems to builders and users of industrial and mobile machinery and equipment.



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The Automation Group is a leading supplier of pneumatic and electromechanical components and systems to automation customers worldwide.



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The user, through its own analysis and testing, is solely responsible for making the final selection of the system and components and assuring that all performance, endurance, maintenance, safety and warning requirements of the application are met. The user must analyze all aspects of the application, follow applicable industry standards, and follow the information concerning the product in the current product catalog and in any other materials provided from Parker or its subsidiaries or authorized distributors.

To the extent that Parker or its subsidiaries or authorized distributors provide component or system options based upon data or specifications provided by the user, the user is responsible for determining that such data and specifications are suitable and sufficient for all applications and reasonably foreseeable uses of the components or systems.

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Cylinders were among the first hydraulic products of Commercial Hydraulics beginning in 1928. In 2000 Commercial Intertech Corp. merged with the Parker Hannifin Corp. Today, the Parker Mobile Cylinder Division is recognized as one of the largest independent manufacturers of hydraulic cylinders for mobile equipment and a leading supplier to refuse, mining, truck, material handling and positioning markets. Parker's Mobile Cylinder Division products include double- and single-acting telescopic cylinders, rod cylinders and "smart cylinders" with internal electronic controls.

Additionally, the company enjoys a reputation for quality custom built cylinders that demonstrate engineering know how and adept manufacturing. Cylinders represent a significant portion of the company's Hydraulic Systems sales - their contribution has resulted in significant capital expenditures geared to establish Parker's Mobile Cylinder Division as the world's leading manufacturer of hydraulic cylinders.

About our Quick Reference and Application Guide . . .

It's our goal to provide our customers with the highest quality cylinders. If the need arises for a cylinder not listed in this guide, please furnish us the following information and we'll do our best to provide a new or replacement.

- | | |
|---|-----------------------------------|
| * OEM identification number | * Retract or closed length |
| * Single- or double-acting type | * Stroke length |
| * Outside diameter of the largest moving stage or rod and bore diameters | * Extend or open length |
| * Number of moving stages | * Pineye sizes |
| * Application | * Plunger mount type |
| | * Base mount type |

Please refer to the cylinder specification data forms for more information.

Parker's Mobile Cylinder Division has complete manufacturing facilities to fill all your cylinder needs from 1 piece to 1000 pieces. If you're looking for a prototype, a special cylinder, or a production run, Parker's Mobile Cylinder Division is the place to call.

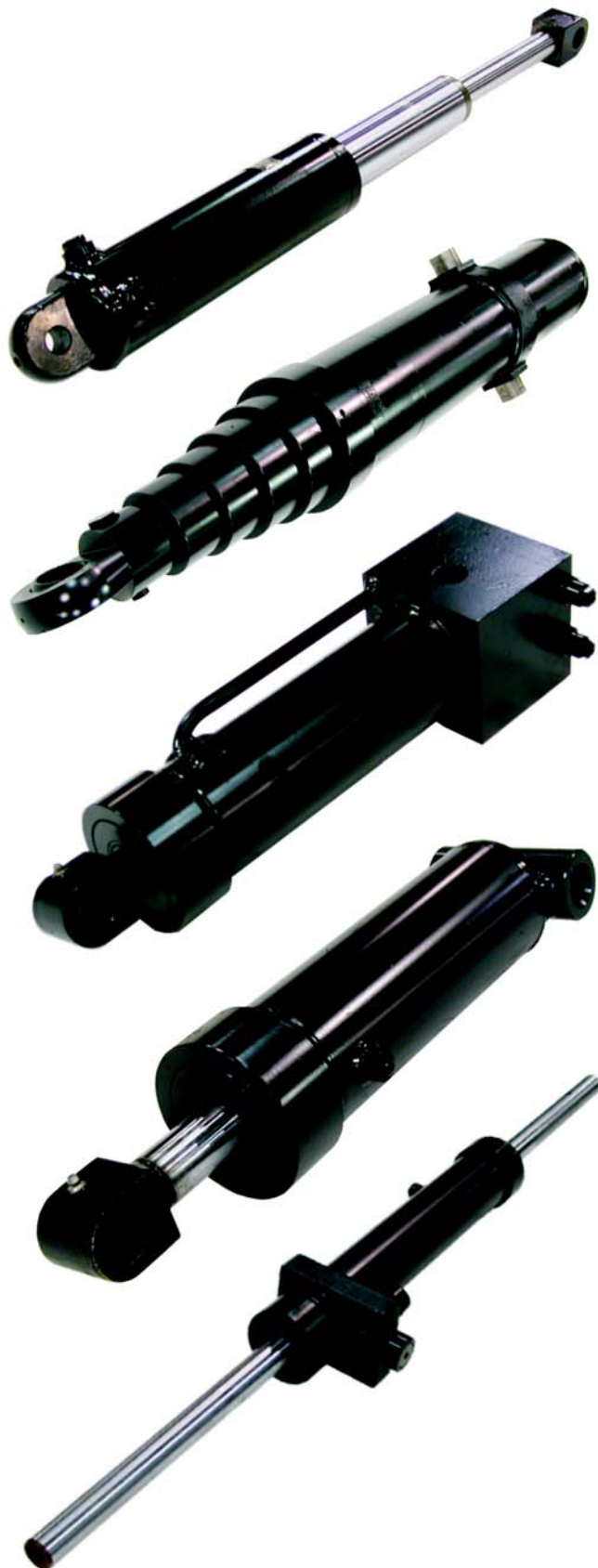
Parker Hannifin Corp.
Mobile Cylinder Div.
P.O. Box 239
Youngstown, OH 44501-0239

Phone: 800-848-5575
Fax: 800-694-3392
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www.parker.com

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*MOBILE CYLINDER DIVISION
PRODUCTS & CAPABILITIES*

- **TELESCOPIC CYLINDERS**
Single Acting
Double Acting
- **SINGLE STAGE “Rod Type” CYLINDERS**
Single Acting
Double Acting
- **BUILD TO CUSTOMER PRINTS OR PER APPLICATION SPECIFICATIONS**
- **BORE SIZES UP TO 20” DIAMETER**
- **STROKE LENGTHS UP TO 500”**
- **OPERATING PRESSURES UP TO 10,000 PSI**
- **VARIOUS OPERATING FLUIDS**
- **BATCH SIZES 1PC TO 100’s**
- **VARIOUS MATERIALS & COATINGS**
Stainless Steel
Electroless Nickel
Nitriding
Chrome
Double Chrome
- **TYPICAL OPTIONS**
Load Holding Valves
Electro-Hydraulic Transducers
End of Stroke Hydraulic Cushions
Protective Rod Boots
Proximity Switches
Flow Controls
Flow Fuses

Single and Double Acting Telescopic Cylinders

ALL NEW DESIGN WITH THE FOLLOWING FEATURES

Urethane Poly Pack Seals

- Custom Configured
- Multi-lip
- R&D and field tested

Internal Bronze Packing Nuts*

- Added bearing support (218% greater length)
- Eliminates back packing of garbage into the wipers
- Reduces Seal Wear

Heavy Chrome Plating

- All stages 0.003" plated *
- 0.002" plating non-FEL pack eject
- Reduces external nicks
- Increased corrosion protection
- Improved wear resistance

Thick Wall Plunger*

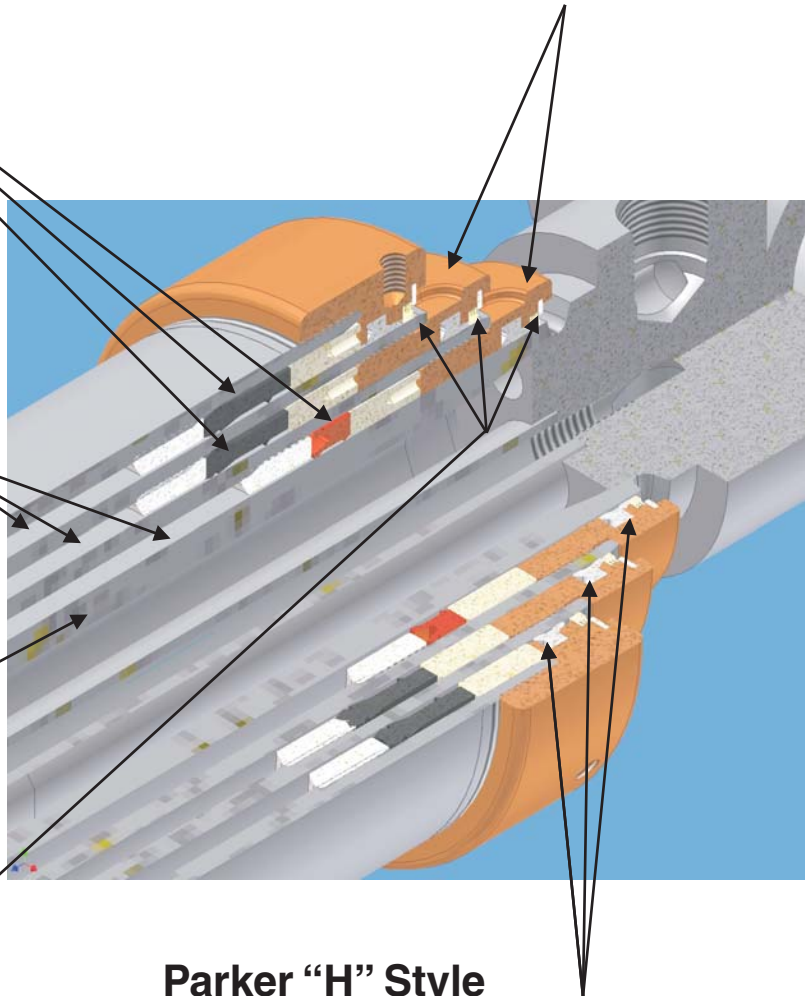
- Reduces flexing
- Helps eliminate fatigue

Full Metal Scrapers*

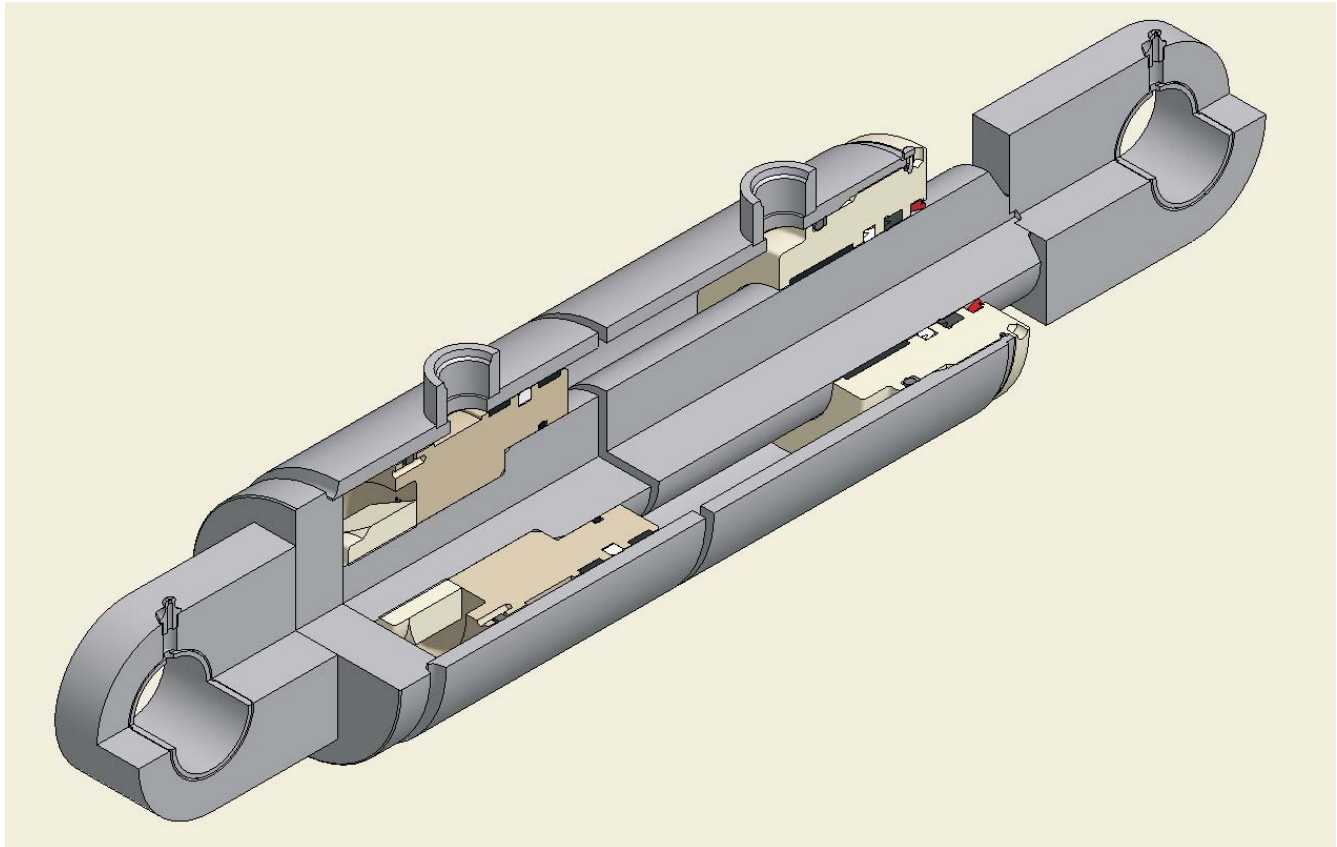
- Bronze scraper ring on each stage
- Removes foreign material from sleeves
- Protects the wipers and seals from external contamination
- Extends seal life

Parker "H" Style Double Lip Wipers

- Stops external contamination from entering
- Prevents oil from escaping



***Features unique to the Front Loader, Pack Eject Cylinders**



Features

- Parker Seal Division – "Zero-leak" Sealing Package
- 100,000 Yield Induction Hardened Chrome Plated Rod as Standard
- Skived and Burnished Tubing
- Hardened Pin-eye Bushings
- Parker "Zero-leak" Internal Bypass Piston Design
- Greater Rod Support

Benefits

- Leak Free Extended Life
- More Resilient to External Damage
- Consistant Quality
- Extends Cylinder Life as Cylinder Wears
- More Efficient / Less Heat
- Resists rod Deflection and Side Loading

Recommended Cylinder Replacement & Maintenance Practices

PURPOSE:

Hydraulic cylinders are the most expensive components to maintain on a collection unit. The following lists recommended guidelines for cylinder replacement practices. When installing a replacement cylinder, it is imperative that all causes of the cylinder failure (oil contamination, structural failures...) be corrected to protect the investment of the replacement cylinder. These recommendations are provided as minimum guidelines when replacing cylinders of collection vehicles.

When replacing a cylinder with a new or remanufactured cylinder, it is recommend that these basic items be performed prior to installation of the replacement cylinder:

1. Identify the root cause of cylinder failure (if applicable).
2. Flush and / or filter hydraulic oil and system. Replace oil and filter if applicable.
3. Check, correct any alignment problems (tracks, mounts, bearings, shoes, pins...).
4. Completely and thoroughly clean the mounting area of any refuse or contamination.
5. Replace all cylinder pins and pin retainers.
6. Replace all cylinder connecting hoses, fittings (flush before installation).
7. Fully lubricate all bearings before initial operation.

Detailed information provided below supports the 7 basic criteria recommended above.

NOTE: Safety and safe working procedures must be followed at all times. OSHA Lock Out Procedures must be followed when maintaining and inspecting this equipment. Follow all safety practices when performing any inspection or maintenance procedures.

A. BEFORE REPLACING CYLINDER - TROUBLESHOOTING and DIAGNOSTICS:

Many times a failed cylinder will be replaced without regard for the root cause of the failure. In most cases, the failure is a result of a “domino” effect of events that occur gradually over time, all contributing to the cylinder failure. Prior to removing and replacing a cylinder from a vehicle and/or returning a cylinder for warranty consideration, the following should be inspected:

1. Determine the root cause of the failure (see troubleshooting table).
2. Inspect the rod/stage(s), the case, and the cylinder mounting (see troubleshooting table).
3. Check & document the hydraulic oil level, appearance and odor. Take and submit an oil sample.
4. Review the operating characteristics of the operator and of that particular unit as compared to other units.
5. Review the repair history of the vehicle.
6. Check & document the hydraulic system pressure and flow. (Reset as required)
7. Does the cylinder have any of the following operational damage that would cause the seal to leak.
 - a) Acid or caustic like corrosive damage.
 - b) Pitting/flaking chrome caused by corrosive material.
 - c) Contamination impregnated in or adhered to the rod that would pass through wipers and damage the seal.
8. Is internal damage (bypass) suspected?
 - a) Fluid contamination (may be indicated by scratches on rod).
 - b) Operating at higher than designed pressures. Has the pressure been checked?
 - c) Has the equipment been improperly operated?
 - d) Cylinder barrel issues that would cause damage to piston seals: dents, bent, wear marks, bulging.
 - e) To check for leakage past the piston: (only on demounted cylinders)
 - Pressurize one end of the cylinder.
 - Allow the cylinder to travel the length of the stroke, fully extended and retracted (to a relaxed position).
 - Remove pressure.
 - Disconnect the fluid line at the opposite port. Caution: Only if cylinder is NOT holding any loads.
 - Re-pressurize the side still connected to the cylinder.
 - Check for fluid leakage past the piston. A typical double acting rod cylinder should have leakage of less than 1/2-cup per minute and a typical double acting telescopic cylinder equipped with cast iron

Recommended Cylinder Replacement & Maintenance Practices

rings should have leakage of less than 1/2-1 gallon per minute.

- f) Is unit operating at high oil temperatures?
- 9. Is there any obvious external operational damage to case or rod?
 - Rod bent, dented, scratched, etc.
 - Non-uniform scratches along length of rod that may indicate side loading.
 - Cylinder barrel issues: dents, bent, wear marks, bulging.
- 10. Are there any cylinder mount issues?
 - Bearings broken/galled/uneven wear.
 - Cylinder Pins: Bent/uneven wear.
 - Improper maintenance (mounting pin seizing due to corrosion - can break weld or mount).
 - Pin mount structural damage: pin hole damaged, worn, torn out, elongated, bearing cracked....

B. CYLINDER REPLACEMENT GUIDELINES:

1. Use the appropriate moving/lifting device when mounting or moving the cylinder. Improper lifting and/or moving may result in injury to person or damage to cylinder.
2. Inspect replacement cylinders for any damage that may have occurred during shipping. (Examples of damage are bent rods, dented casings, bearing broken or missing, ports bent or caps missing, etc.)
3. Determine that the problem that caused the original cylinder to fail has been corrected.
4. If internal damage has been detected or if water is present in the oil, the hydraulic fluid is contaminated.

It is very important that the entire hydraulic system be flushed and all filters be changed.

If the hydraulic system is not cleaned, the replacement cylinder will be contaminated causing premature failure of that cylinder, along with other components of the hydraulic system. Filter cart flushing may be substituted.

Alternative to full unit flushing is to use hydraulic filter buggy and flush the system. If cylinders are being replaced because of catastrophic hydraulic failures, complete fluid flush and replacement is recommended. When in doubt, replace all fluids and filters.

- a) Retract all cylinders and drain tank.
- b) Thoroughly flush hydraulic tank and wipe clean with clean, lint-free cloths.
- c) Install new pressure and return filter elements. If unit does not have filtration, contact your equipment supplier for recommendations.
- d) Fill the tank with new oil. Consult OEM Operations and Service Manuals for recommended oil. Insure that all cylinders are retracted when filling.
5. Clean all fittings, hydraulic lines and connections to ensure no debris or contamination is present. Debris can and will shorten the life of the cylinders and hydraulic system. Remove port plugs only when ready to attach lines or tubes.
 - a) If necessary, flush the hydraulic lines and other components with new oil.
6. Replace the pins, hydraulic lines, and/or fittings if wear or damage is present.
7. **INSPECT FOR POSSIBLE SIDE LOADING CONDITIONS.**
 - a) Proper alignment of the cylinder rod, barrel and their respective mounts should be checked in both the retracted and extended positions.
 - b) Pins should pass freely through both the cylinder and body mounts. Replace worn pins and repair damaged or out-of-round body mounts.
 - c) Improper alignment will result in excessive rod, head gland nut, barrel and/or piston wear.
 - d) Insure rod end bushings are lubricated and moving freely, this will help to prevent side loading.
 - e) **DO NOT** operate a packer / ejector cylinder with a misaligned packing panel or ejector. If the packer / ejector is bent, damaged, or if the panel slide shoes or guide track assembly are worn out, it will cause excessive side loading to the cylinder.
8. If painting is required, insure that the rod is completely covered and no paint adheres to the rod. Paint on the cylinder rod will enter the seal area and damage the seal.
9. If any welding has to be performed to the cylinder (i.e.- installing a control tab to a mounting end) the welding ground should be attached to the mounting surface of the cylinder. Grounding to the body and welding to the cylinder can cause an arc between the piston and barrel, destroying seals and causing arc damage to sleeve surfaces.

Recommended Cylinder Replacement & Maintenance Practices

10. Check that operating pressures/settings are to the OEM specification.
 - a) Make adjustments with the hydraulic oil at normal operating temperatures.
 - b) DO NOT operate a cylinder at a pressure above factory recommended operating pressures.
 - c) If in doubt, back the setting off, check the pressure, and readjust.
 - d) Cycle the cylinder a number of times to remove any entrapped air.
 - e) Set all functions, flows, speeds and interlocks per OEM recommendations.

C. STORAGE:

1. For best storage life, hydraulic cylinders should be stored in a location that is protected from undue temperature, humidity and moisture extremes (condensation build up within the cylinder will cause oxidation and corrosion damage to sealing surfaces).
2. Insure that all ports are plugged. Do not over tighten.
3. To prevent rusting of chrome surfaces, store cylinders w/ rods and stages fully retracted. Any exposed surfaces should be coated with a film of grease or oil.
4. If rust is present, sand surfaces with a 320 or 400 grit paper around the circumference of the chrome surface. If, after sanding, the surface still shows rust damage, call cylinder OEM for instructions.
5. To prevent the rod seals from becoming dried out, store cylinders in a vertical position with the rod eye down. If horizontal storage is a necessity, rotate the cylinder every few months to allow residual oil to keep the internal components wetted.

D. PRACTICES FOR LONG CYLINDER LIFE:

1. Insure that operators are trained and understand the capabilities and limitations of the vehicle.
2. Conduct proper operation and maintenance practices.
 - a) Replace the hydraulic oil and filter at regular intervals.
 - b) Check the temperature of the hydraulic oil regularly to insure it is maintaining the optimum operating temperature recommended by the manufacturer.
 - c) Lubricate the bushings and grease points regularly. If a bearing wears out and damages the bearing housing, the entire cylinder may require replacement.
3. Protect the cylinder from debris and external damage during operation and cleaning operations.

A cylinder living in refuse will become refuse.

 - a) Keep the area behind the ejector, in and around all cylinders, pins and fittings clear of debris.
 - b) Keep the cylinder rod free from debris when cleaning by covering the cylinder rod or retracting the cylinder fully before cleaning.
 - c) Use plastic tools (i.e. shovels) when removing debris from body. Metal tools will nick and damage the cylinder rods.
 - d) Cover the cylinder rod and case with a fire proof blanket when welding or grinding near the cylinder and exposed rod. If practical, remove cylinder from area under repair.
4. Insure that the cylinder is operating in its natural center-line (NO SIDE LOADING).
 - a) Perform regular inspections and maintenance of all moving components being powered by hydraulic cylinders (i.e. - packer wear shoes, arm torque bearings, etc.).
5. Perform regular inspection to insure the rod, seals, cylinder ports, hoses, and grease/ hydraulic fittings are in good operating condition.
6. When working with or changing cylinders it is important to check the condition of cylinder hydraulic hoses.
 - a) Hoses experience numerous cycles each day in very contaminated areas.
 - b) Hoses should be inspected and replaced as inspection dictates. When in doubt, replace the hose.
7. DO NOT repair damaged or broken cylinder casing or ports.
 - a) If a problem arises the cylinder should not be repaired, but replaced with a new or remanufactured OEM cylinder that meets OEM specifications.
 - b) Welding changes the characteristics of metal on cylinders and may lead to future cylinder failures and may void warranty consideration.
8. A double acting telescopic cylinder should be fully retracted when not in use (i.e. - eject cylinders).
 - a) Severe side loading may occur due to road vibration.
 - b) Cylinders stages may drift due to road vibration. Extending the cylinder before fully retracting may cause misstaging that over pressurizes and damages the cylinder.

Hydraulic Cylinder Troubleshooting Table

	- Something external hitting surface.	- Side Loading (improper mounting or operation alignment)**	- Fluid Contamination *	- Something external hitting / rubbing surface.	- Attaching welding grd. to cyl. or accidentally hitting cyl. w/welder.	- Exposing to something corrosive or using an acid base cleaner.	- Operating at higher than designed pressures (SEE EXAMPLES).	- Obstruction of normal operation.	- Improper equipment operation (SEE EXAMPLES).	- Not properly cleaning or allowing to operate in refuse.	- Defective Material.	- Welding problem during mfg. (typically will fail in 1st month)	- Improper op./maint. (not properly lubricating pins).	- Check compatibility of hydraulic fluid.	- Check exposure to external heat.	- Check system operating temperature.
Rod Stage(s)																
Nicks/gouges	X															
Scratches/uneven wear		X	X	X												
Marks from arc welding					X											
Acid damage						X										
Bent		X					X	X	X							
Pitting/flaking chrome						X				X	X					
Bulging a telescopic stage							X		X							
Case Issues																
Dents				X												
Bent		X					X	X	X							
Wear marks		X		X												
Weld cracks/failure		X					X	X	X			X				
Bulging							X		X							
Mounts																
Bearings broken/uneven wear		X					X	X	X				X			
Bent/uneven wear		X					X	X	X							
Weld cracks/failure		X					X	X	X			X				
Improper maintenance (mounting pin seizing due to corrosion - can break weld or mount)													X			
Internal Damage (By-Pass)		X	X				X		X							
Seals																
Soft or gummy														X		
Hard, cracked, or no elasticity														X	X	X
Split or rolled						X		X								

* Factory fluid contamination will typically be found in the first month of service.

** Evidence of unusual wear or rubbing at mounting or along cylinder barrel would be good indication of side loading.

Examples of Situations that Cause Operation at Higher than Designed Pressures:

1. Improper system setting.
2. Faulty system components.
3. Improper system plumbing/design (mainly an obstruction of the fluid exiting the cylinder).
4. Improper equipment operation

Examples of Improper Equipment Operation

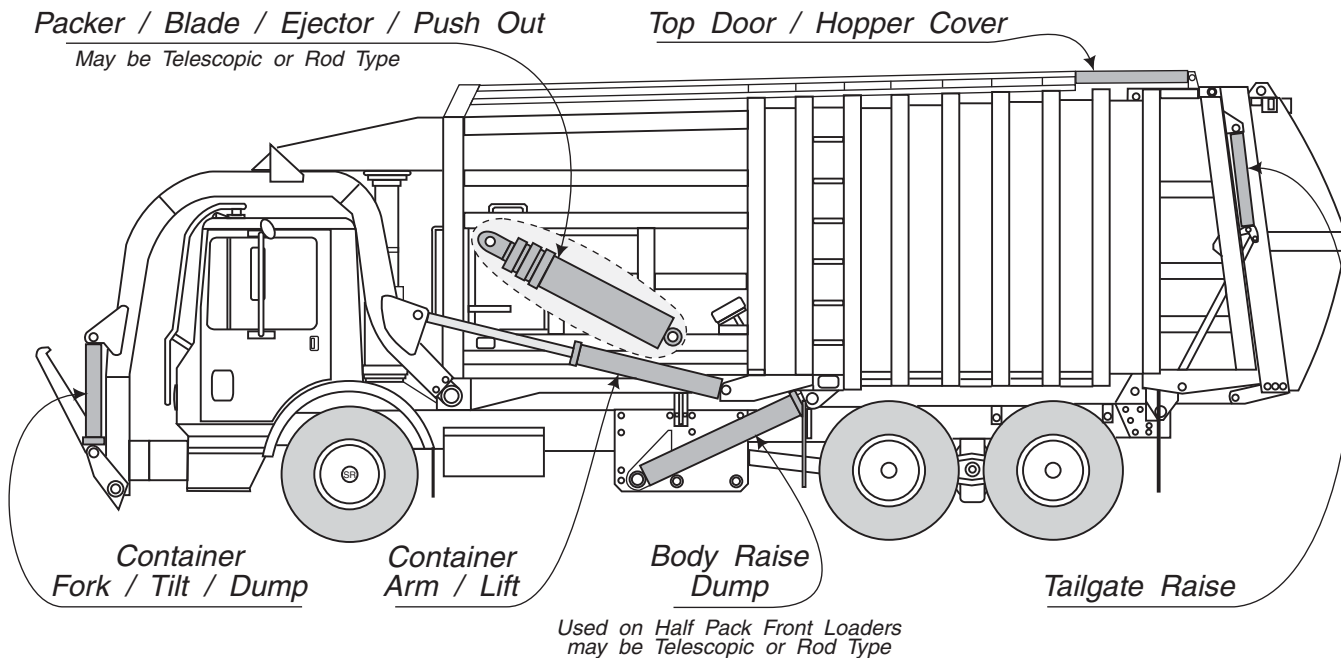
The following lists some of the ways equipment is used improperly. Any of these can cause cylinder failure that would also jeopardize the warranty.

1. Back packing.
2. Operating cylinder over maximum recommended pressure or flow (speed).
3. Off side load (not evenly distributing the load in the bed).
4. Unloading when the vehicle is not on level ground.
5. Trying to break loose a sticking load by jerking or "sling-shotting" the vehicle.
6. Stopping suddenly while dropping a loaded box.
7. Moving vehicle with lift cylinders extended.
8. Not properly cleaning and allowing cylinder to operate in refuse (rod damage and/ side loading).
9. Rapid shifting of directional valve to shake load.
10. Traveling with ejector blade not in retracted position.
11. Not following maintenance instructions.

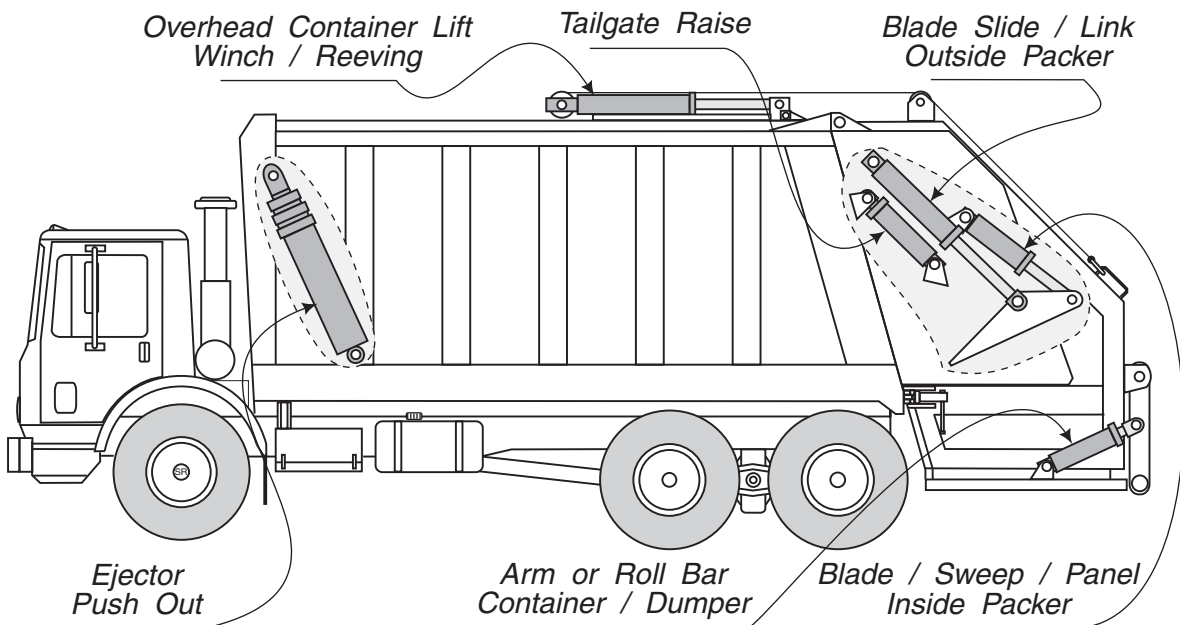
Examples of Side Loading

1. Garbage packed up around/under cylinder.
2. Broken bearings.
3. Mis-aligned mounting.

Front Loader Refuse Bodies

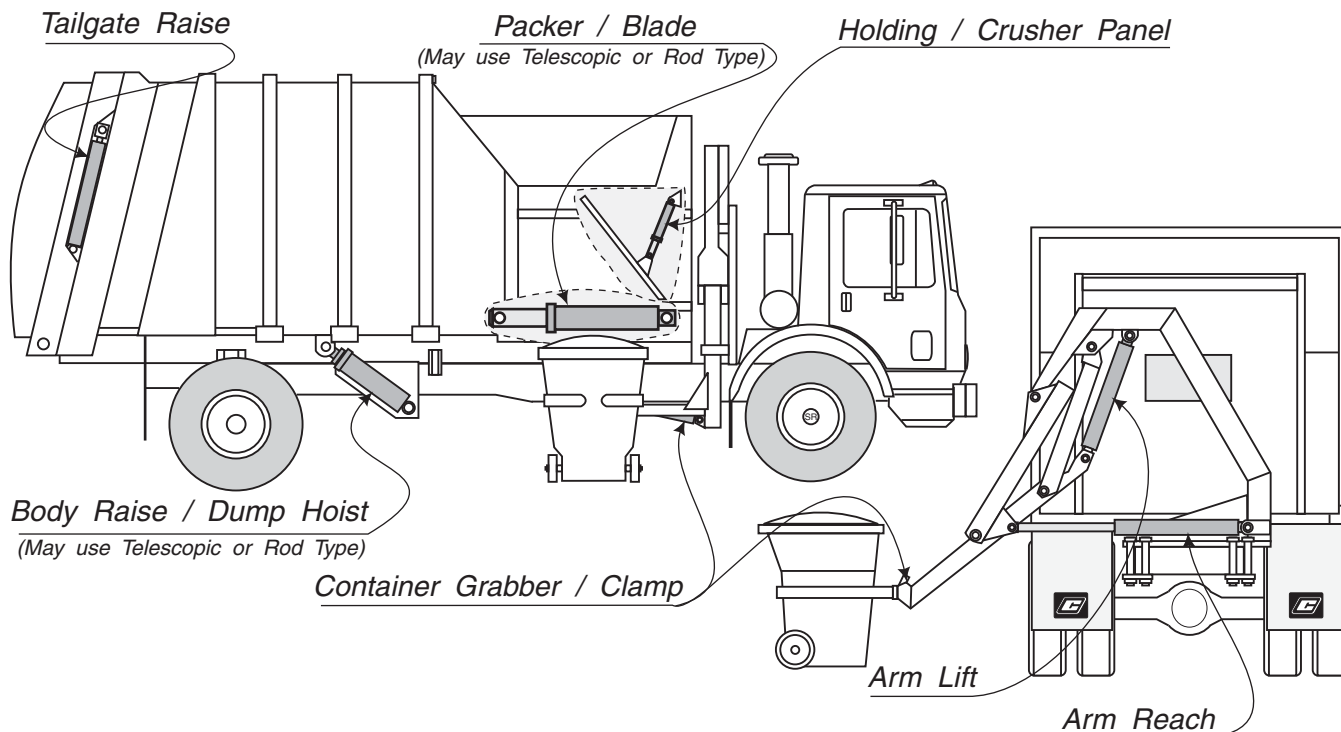


Rear Loader Refuse Bodies

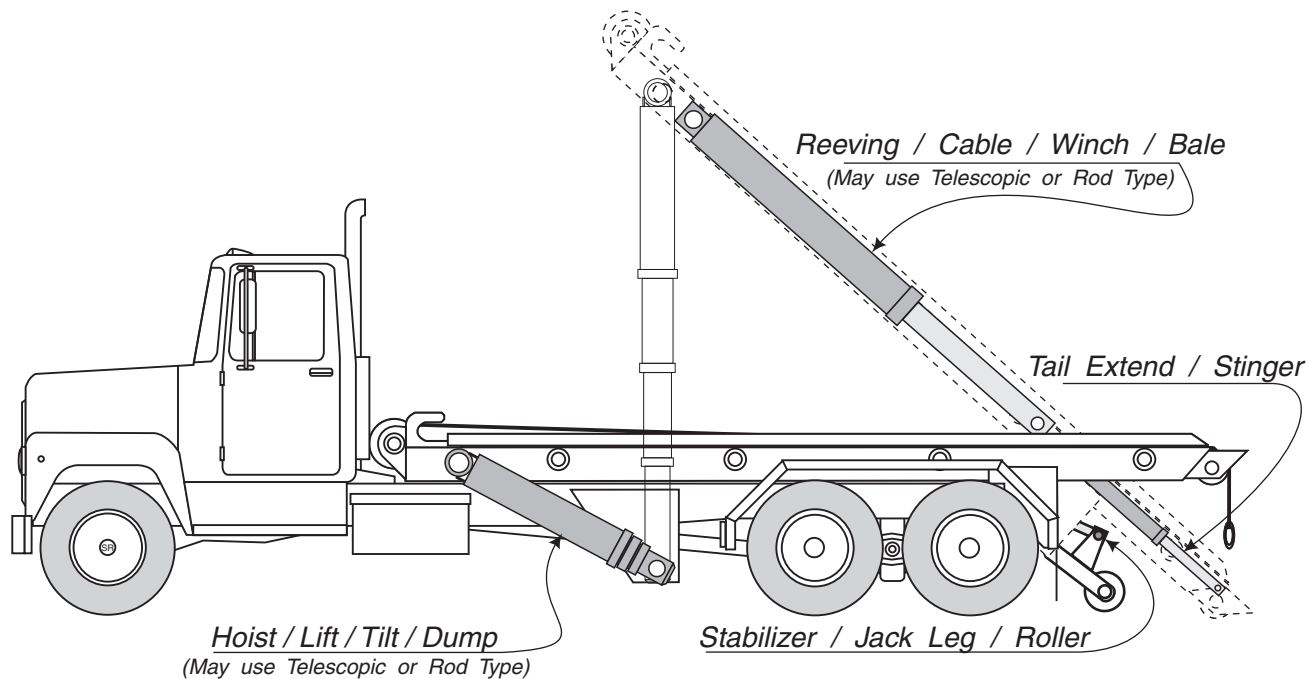


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Side Loader Refuse Bodies

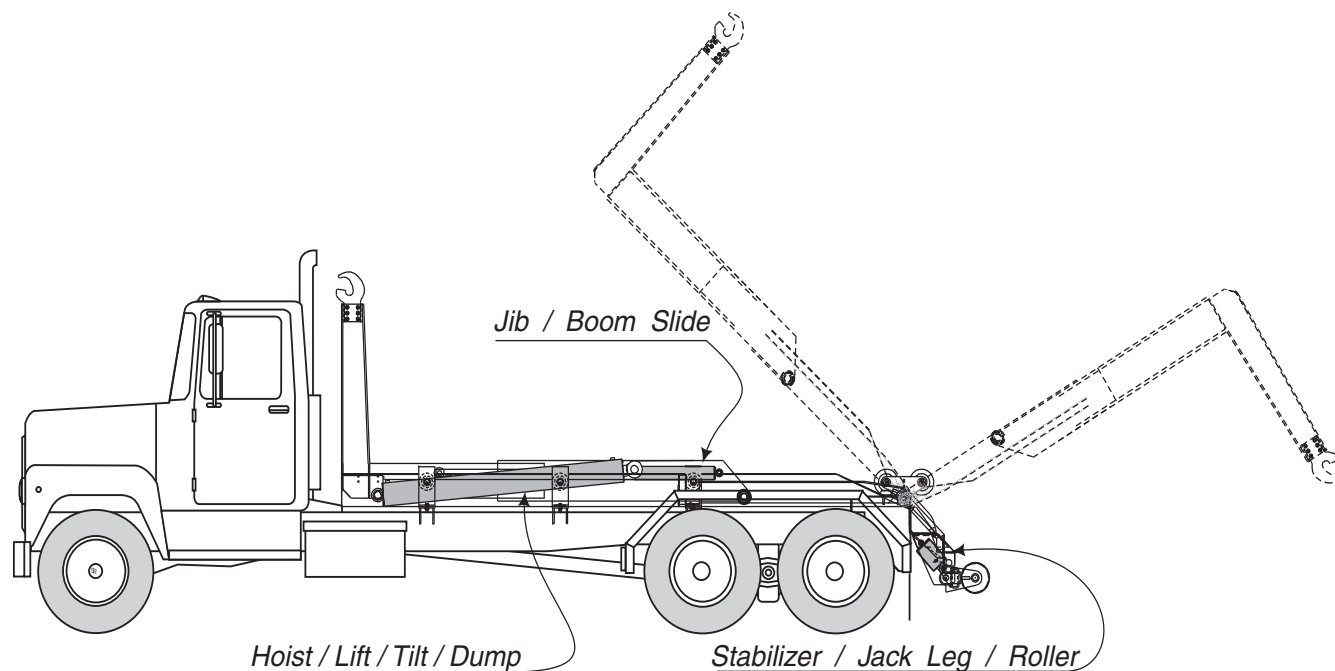


Roll-Off & Tilt Frame Hoists

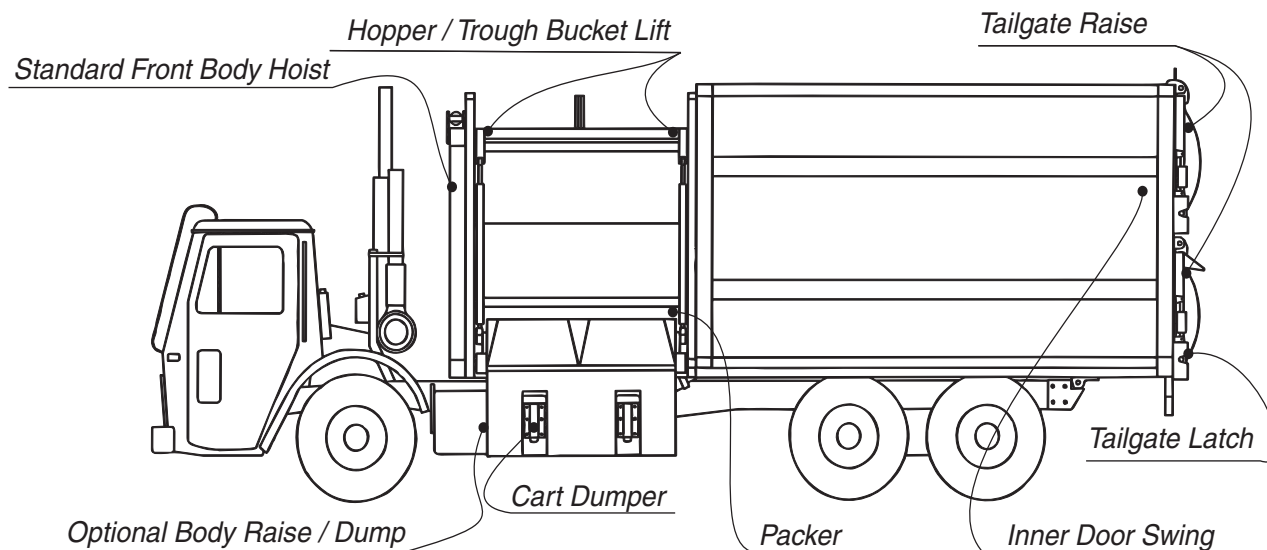


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Hook Lift Roll-Off Hoists

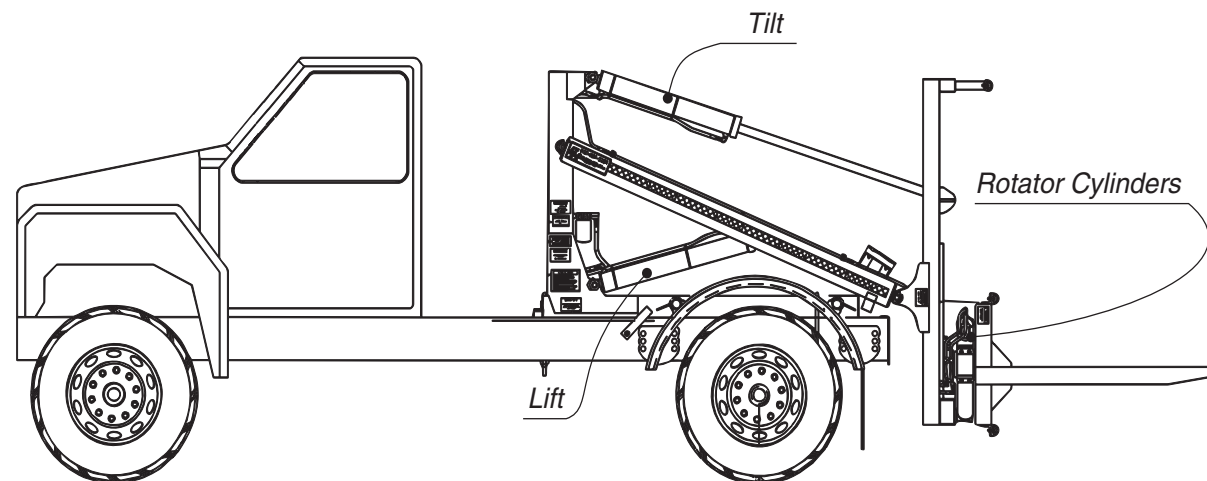


Recycling Body

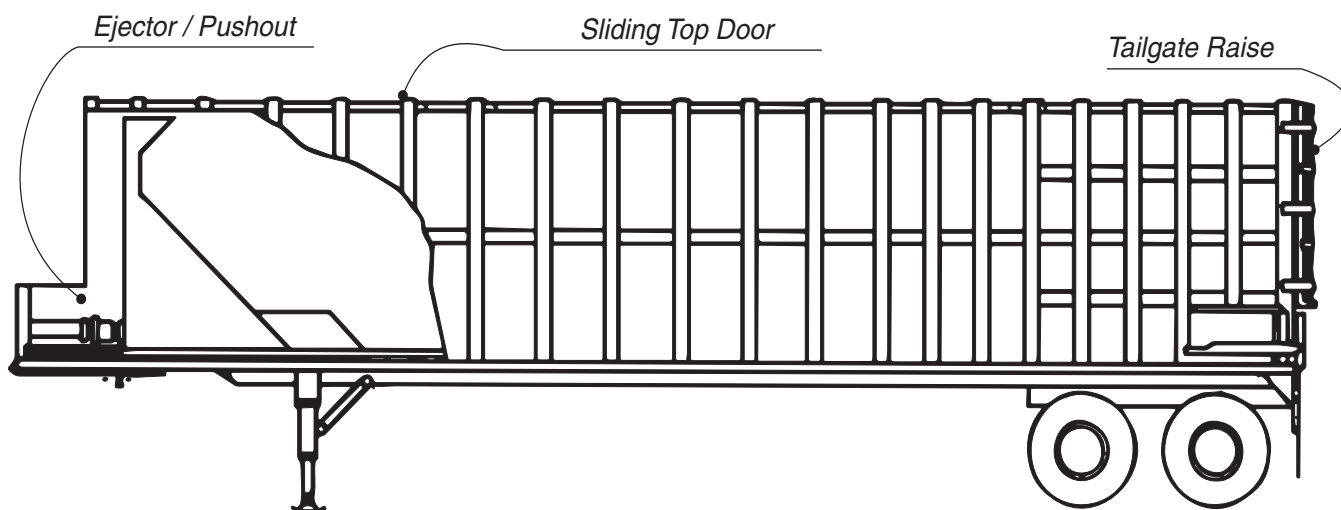


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Container Carrier



Transfer Trailer



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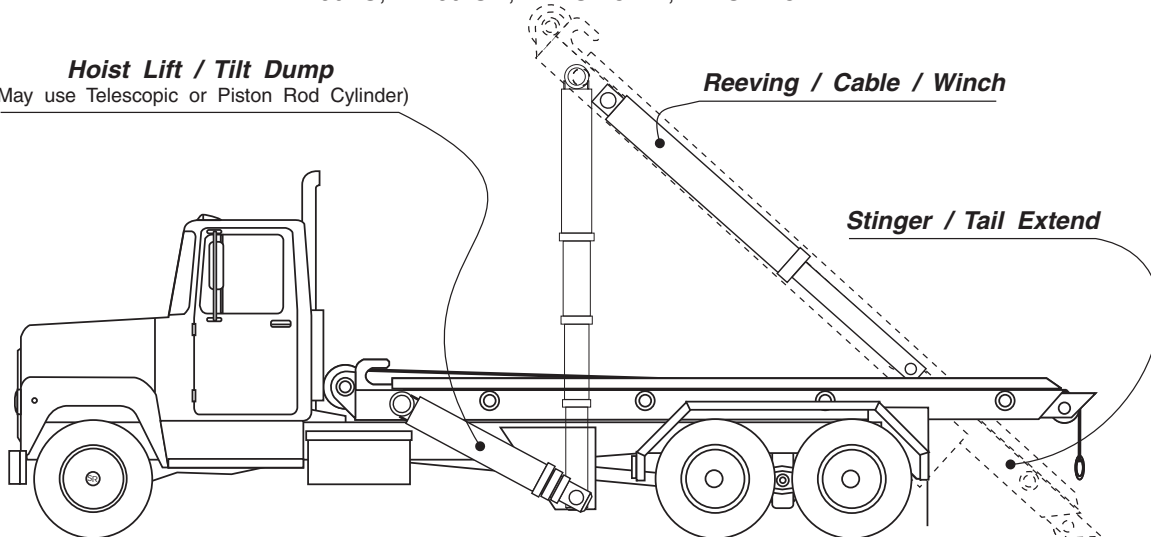
Accurate Industries IO, OR & IR Roll-Off

AH-60-IO, AH-60-OR, AH-IO-75-EX, AH-OR-75-EX

Hoist Lift / Tilt Dump
(May use Telescopic or Piston Rod Cylinder)

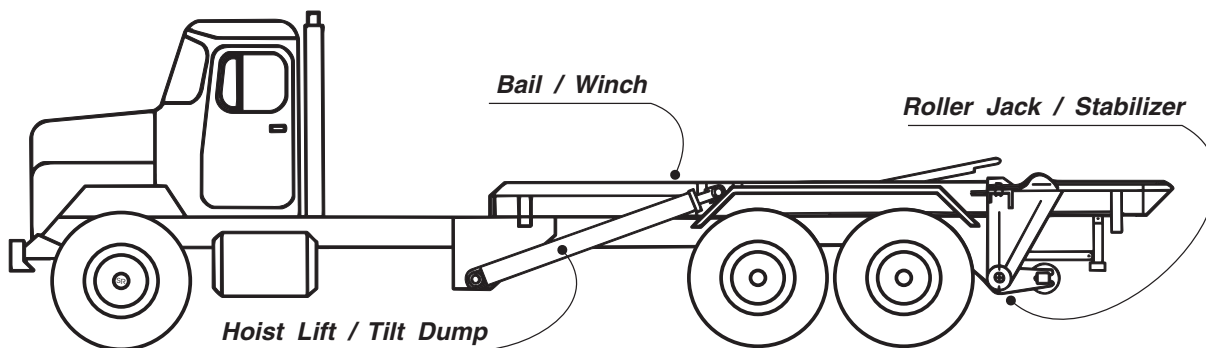
Reeving / Cable / Winch

Stinger / Tail Extend



<u>Cylinder Function</u>	<u>Parker Eng#</u>	<u>Parker Number</u>	<u>Bore</u>	<u>Rod</u>	<u>Stroke</u>
Reeving / Cable / Winch; 60,000# OEM Ref P.N's; HH-1, HP-HH001	D62LB-5-80	3771421180	6.25	4.75	80.00
Reeving / Cable / Winch; 75,000# OEM Ref P.N's; MF-51, HH-2, HP-HH002	D72LB-9-80	3772521122	7.25	4.75	80.00
Hoist Lift / Tilt Dump; 60,000# OEM Ref P.N's; HH-1, HP-HH001	D62LB-5-80	3771421180	6.25	4.75	80.00
Hoist Lift / Tilt Dump; 75,000# OEM Ref P.N's; MF-51, HH-2, HP-HH002	D72LB-9-80	3772521122	7.25	4.75	80.00
Hoist Lift / Tilt Dump; Telescopic OEM Ref P.N's; HP-HH004, HP-HH011, HP-HH012	SD73DB-5-120	3772533049	Telescopic		120.00
Stinger Tail Extend OEM Ref P.N's; HP-HH003	N/A		3.50		80.00

Accurate Industries AH-AB-60 Bail Hook Roll-Off



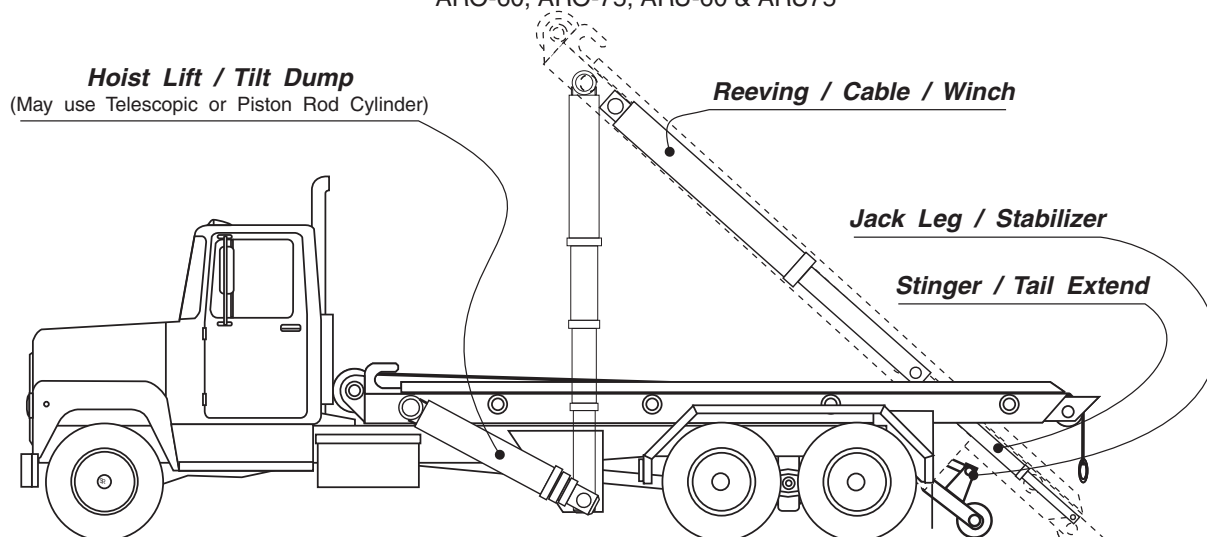
<u>Cylinder Function</u>	<u>Parker Eng#</u>	<u>Parker Number</u>	<u>Bore</u>	<u>Rod</u>	<u>Stroke</u>
Bail / Winch OEM Ref P.N's; A-17	D72CC-48-85	3772521066	7.25	3.00	85.00
Hoist Lift / Tilt Dump OEM Ref P.N's; A-18	D62CC-36-68	3770921069	6.25	3.00	68.50
Roller Jack / Stabilizer OEM Ref P.N's; A-19, HP-HH007	D52CB-31-6	3771521140	5.25	2.50	6.88

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Compactor						
<u>OEM Ref P.N.</u>	<u>Cylinder Function</u>	<u>Parker Eng#</u>	<u>Parker Number</u>	<u>Bore</u>	<u>Rod</u>	<u>Stroke</u>
	Packer	SD62MC-10-46	3771432039		Telescopic	46.00
Roll-Offs						
<u>OEM Ref P.N.</u>	<u>Cylinder Function</u>	<u>Parker Eng#</u>	<u>Parker Number</u>	<u>Bore</u>	<u>Rod</u>	<u>Stroke</u>
A-17	Bale	D72CC-48-85	3772521066	7.25	3.00	85.00
A-18	Hoist Lift	D62CC-36-68	3770921069	6.25	3.00	68.50
A-19	Stabilizer Jackleg	D52CB-31-6	3771521140	5.25	2.50	6.88
HP-HH001	Hoist Lift & Cable Reeving	D62LB-5-80	3771421180	6.25	4.75	80.00
HP-HH002	Hoist Lift & Cable Reeving	D72LB-9-80	3772521122	7.25	4.75	80.00
HP-HH004	Hoist Lift	SD73DB-5-120	3772533049		Telescopic	120.00
HP-HH006	Cable Reeving	D72LB-7-115	3772521100	7.25	3.00	115.00
HP-HH007	Stabilizer Jackleg	D52CB-31-6	3771521140	5.25	2.50	6.88
HP-HH008	Hoist Lift & Cable Reeving	D62DB-8-79	3771421105	6.25	4.75	79.25
HP-HH011	Hoist Lift	SD73DB-5-120	3772533049		Telescopic	120.00
HP-HH012	Hoist Lift	SD73DB-5-120	3772533049		Telescopic	120.00
MF-51	Hoist Lift & Cable Reeving	D72LB-9-80	3772521122	7.25	4.75	80.00
MF-51-N	Hoist Lift & Cable Reeving	D62DB-8-79	3771421105	6.25	4.75	79.25
Transfer Station Compactor						
<u>OEM Ref P.N.</u>	<u>Cylinder Function</u>	<u>Parker Eng#</u>	<u>Parker Number</u>	<u>Bore</u>	<u>Rod</u>	<u>Stroke</u>
	Packer; 1250XHD	D100DB-1-141	3773121024	9.88	7.90	141.00
	Packer	D100DB-1-225	3773121038	9.88	7.90	225.00
	Packer	D120DB-1-250	3776421026	12.00	7.90	250.00
Transfer Trailer						
<u>OEM Ref P.N.</u>	<u>Cylinder Function</u>	<u>Parker Eng#</u>	<u>Parker Number</u>	<u>Bore</u>	<u>Rod</u>	<u>Stroke</u>
	Ejector / Push Out	SD85DC-2-380	3772935014		Telescopic	360.00
	Ejector / Push Out	SD85DC-2-440	3772935021		Telescopic	440.00
	Ejector / Push Out	SD85DC-2-460	3772935015		Telescopic	460.00

Automated Waste / American Roll-Off

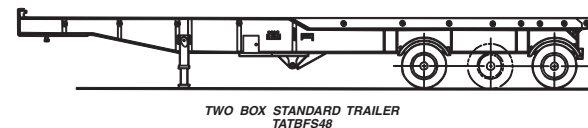
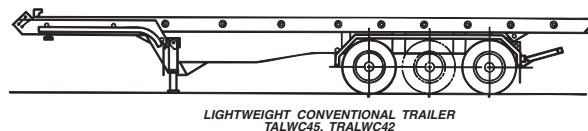
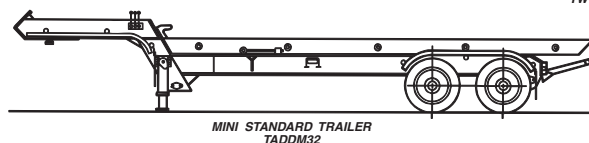
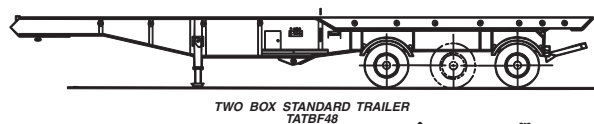
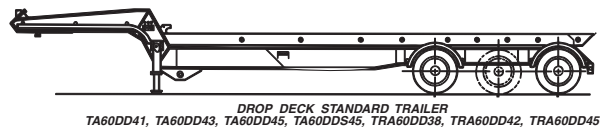
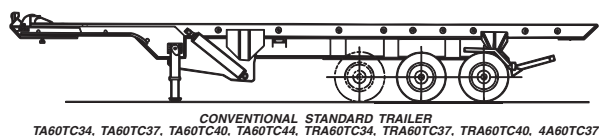
ARO-60, ARO-75, ARU-60 & ARU75



<u>Cylinder Function</u>	<u>Parker Eng#</u>	<u>Parker Number</u>	<u>Bore</u>	<u>Rod</u>	<u>Stroke</u>
Reeving / Cable / Winch; 50,000# OEM Ref P.N's; B611	D62CB-18-78	3771421098	6.25	4.75	78.00
Reeving / Cable / Winch; 60,000# Pre 92 OEM Ref P.N's; 110-450	D62CB-20-80.88	3771421226	6.25	4.75	80.88
Reeving / Cable / Winch; 60,000# 92 & Newer OEM Ref P.N's; 110-460	D62CC-58-80.88	3771421227	6.25	4.75	80.88
Reeving / Cable / Winch; 75,000# Pre 92 OEM Ref P.N's; 110-500	D72CB-14-83.62	3772521135	7.25	4.75	83.62
Reeving / Cable / Winch; 75,000# 92 & Newer OEM Ref P.N's; 110-510	D72CC-53-80.88	3772521134	7.25	4.75	80.88
Hoist Lift / Tilt Dump; 50,000# OEM Ref P.N's; B611	D62CB-18-78	3771421098	6.25	4.75	78.00
Hoist Lift / Tilt Dump; 60,000# Pre 92 OEM Ref P.N's; 110-450	D62CB-20-80.88	3771421226	6.25	4.75	80.88
Hoist Lift / Tilt Dump; 60,000# 92 & Newer OEM Ref P.N's; 110-460	D62CC-58-80.88	3771421227	6.25	4.75	80.88
Hoist Lift / Tilt Dump; 75,000# Pre 92 OEM Ref P.N's; 110-500	D72CB-14-83.62	3772521135	7.25	4.75	83.62
Hoist Lift / Tilt Dump; 75,000# 92 & Newer OEM Ref P.N's; 110-510	D72CC-53-80.88	3772521134	7.25	4.75	80.88
Hoist Lift / Tilt Dump; Telescopic OEM Ref P.N's; 110-100	SD63CC-46-91.75	3771433926	Telescopic		92.00
Hoist Lift / Tilt Dump; Telescopic OEM Ref P.N's; 110-200, 110-300, B532C	SD63CC-46-109.75	3771433927	Telescopic		110.00
Stinger / Tail Extend OEM Ref P.N's; 110-870	D35LC-1-60	3770621037	3.50	2.00	60.00
Stinger / Tail Extend OEM Ref P.N's; 110-800	D35LC-1-80	3770621038	3.50	2.00	80.00
Jack Leg / Stabilizer OEM Ref P.N's; 110-600	N/A		5.50	2.00	8.00

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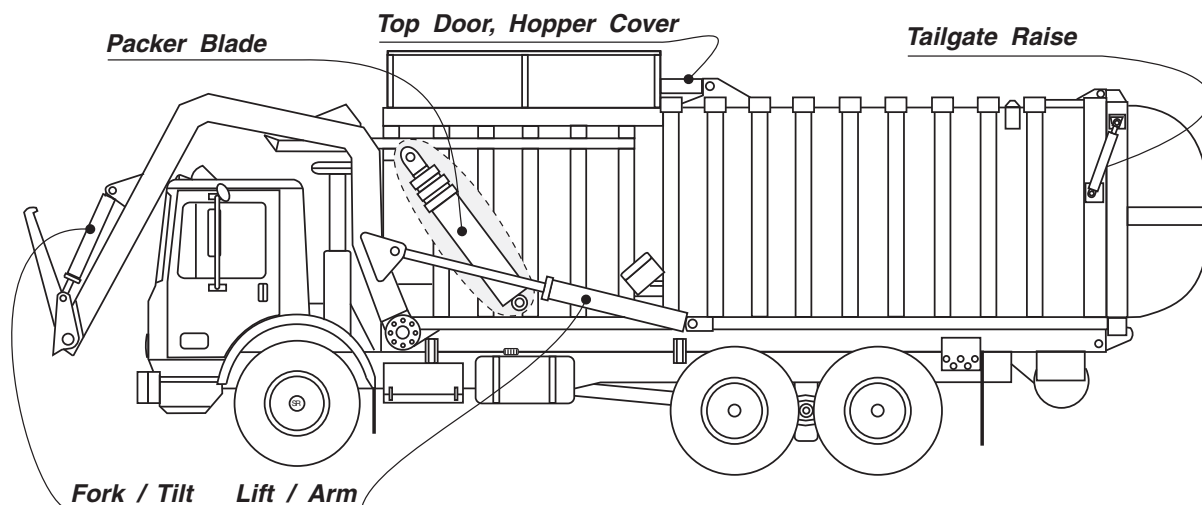
Benlee Roll-Off Trailers



<u>Cylinder Function</u>	<u>Parker Eng#</u>	<u>Parker Number</u>	<u>Bore</u>	<u>Rod</u>	<u>Stroke</u>
Reeving / Cable / Winch OEM Ref P.N.'s;	D60CC-27-78	3771421157	6.00	4.50	78.00
Reeving / Cable / Winch OEM Ref P.N.'s;	D70CC-8-108	3773721018	7.00	5.50	108.00
Reeving / Cable / Winch OEM Ref P.N.'s	D70CC-8-131	3773721012	7.00	5.50	131.00
Reeving / Cable / Winch OEM Ref P.N.'s	D70CC-9-152	3773721014	7.00	5.50	152.00
Reeving / Cable / Winch OEM Ref P.N.'s	D70CC-9-165	3773721015	7.00	5.50	165.00
Reeving / Cable / Winch; Telescopic OEM Ref P.N.'s	SD83CC-29-120	3772833014	Telescopic		120.00
Reeving / Cable / Winch; Telescopic OEM Ref P.N.'s	SD83CC-29-165	3772833013	Telescopic		165.00
Hoist Lift / Tilt Dump; Telescopic OEM Ref P.N.'s	SD63DB-14-120	3771433104	Telescopic		120.00
Hoist Lift / Tilt Dump; Telescopic OEM Ref P.N.'s	SD74DB-6-144	3772534037	Telescopic		144.00
Hoist Lift / Tilt Dump; Telescopic OEM Ref P.N.'s	SD84DD-2-168	3772934039	Telescopic		168.00
Hoist Lift / Tilt Dump; Telescopic OEM Ref P.N.'s	SD85DB-5-220	3773035034	Telescopic		220.00
Hoist Lift / Tilt Dump; Telescopic OEM Ref P.N.'s	SD95DD-1-174	3773135020	Telescopic		174.00
Hoist Lift / Tilt Dump; Telescopic OEM Ref P.N.'s	SD95DD-1-220	3773135019	Telescopic		220.00

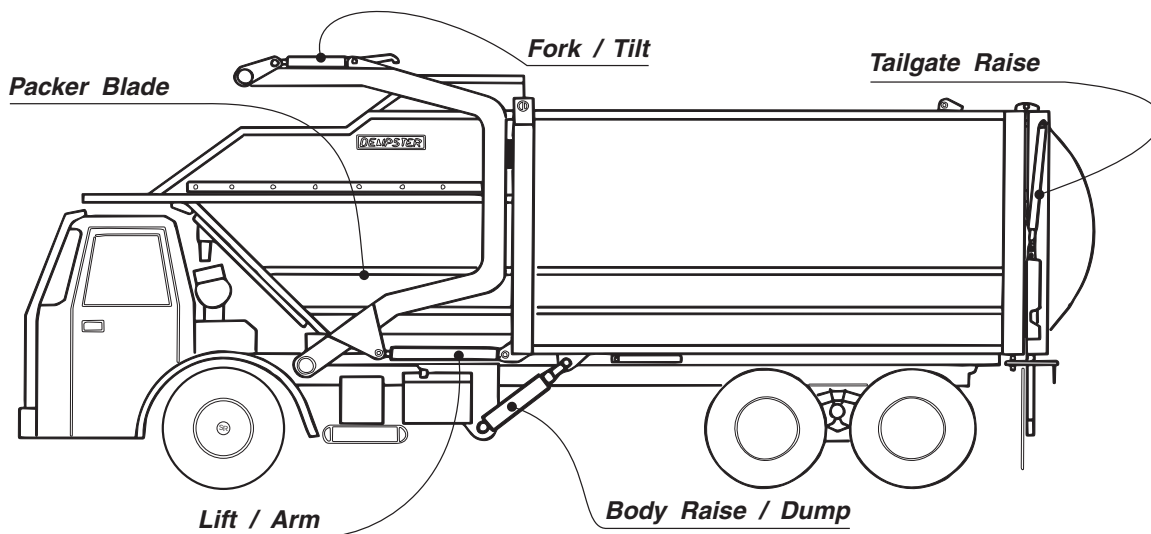
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Dempster DP80 & XHD Front Loader



<u>Cylinder Function</u>	<u>Parker Eng#</u>	<u>Parker Number</u>	<u>Bore</u>	<u>Rod</u>	<u>Stroke</u>
Arm / Lift OEM Ref P.N.'s; BB8000, BB8185, BB8374-1, AB19775TH, AB19890TH	D3812	3790003812	5.00	2.50	46.80
Arm / Lift, XHDII OEM Ref P.N.'s; AB28802	N/A		5.00	2.50	46.88
Fork / Tilt OEM Ref P.N.'s; BB8004, BB8169, BB8748-1, AB19869TH	D40CD-10-24	3776821072	4.00	2.00	24.00
Top Door, Hinged OEM Ref P.N.'s; BB8010, BB8379-1, AB19774TH, AB19868TH	D40CE-3-24	3776821073	4.00	2.00	24.00
Top Door, Sliding OEM Ref P.N.'s; DB8238	N/A	N/A			
Tailgate Raise OEM Ref P.N.'s; AB12225, AB12265, AB12308, AB13978	D25LL-12-16	3772621129	2.50	1.50	16.00
Tailgate Raise, with E Z Locks OEM Ref P.N.'s; AB28819	N/A		3.00	1.75	37.50
Packer Blade, DP80-25 & 28 YD OEM Ref P.N.'s; CB8245, DB1746, DB1747, DB4752	SD85CC-20-156	3773035033	Telescopic		156.00
Packer Blade, DP80-31, 34, 38 & 41 YD OEM Ref P.N.'s; CB4753, CB7599, CB8217, DB1748, DB4753, DB5801, AB15905	SD96CC-3-199	3773136009	Telescopic		198.00
Packer Blade, XHD-33 & 38 Yd OEM Ref P.N.'s; DB8045, AB19473	SD94CC-9-190	3773134006	Telescopic		190.00

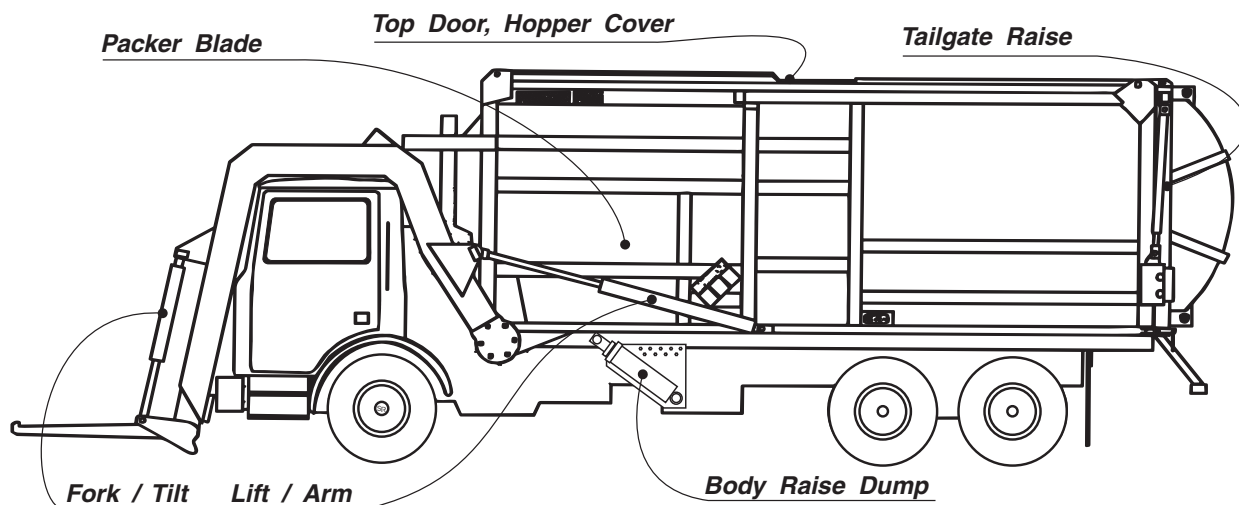
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<u>Cylinder Function</u>	<u>Parker Eng#</u>	<u>Parker Number</u>	<u>Bore</u>	<u>Rod</u>	<u>Stroke</u>
Arm / Lift OEM Ref P.N.'s; AB29405, CB11061	D40CC-25-32	3776821088	4.00	2.50	32.00
Fork / Tilt OEM Ref P.N.'s; DB8142, AB29406	D35CD-10-20	3773821065	3.50	1.50	20.00
Tailgate Raise OEM Ref P.N.'s; DB8362, AB29246	D25LL-16-24	3772621136	2.50	1.50	24.00
Packer Blade OEM Ref P.N.'s; CB11062	D45CC-17-45	3774121039	4.50	3.00	45.00
Body Raise / Dump OEM Ref P.N.'s; AB29336	N/A		Telescopic		

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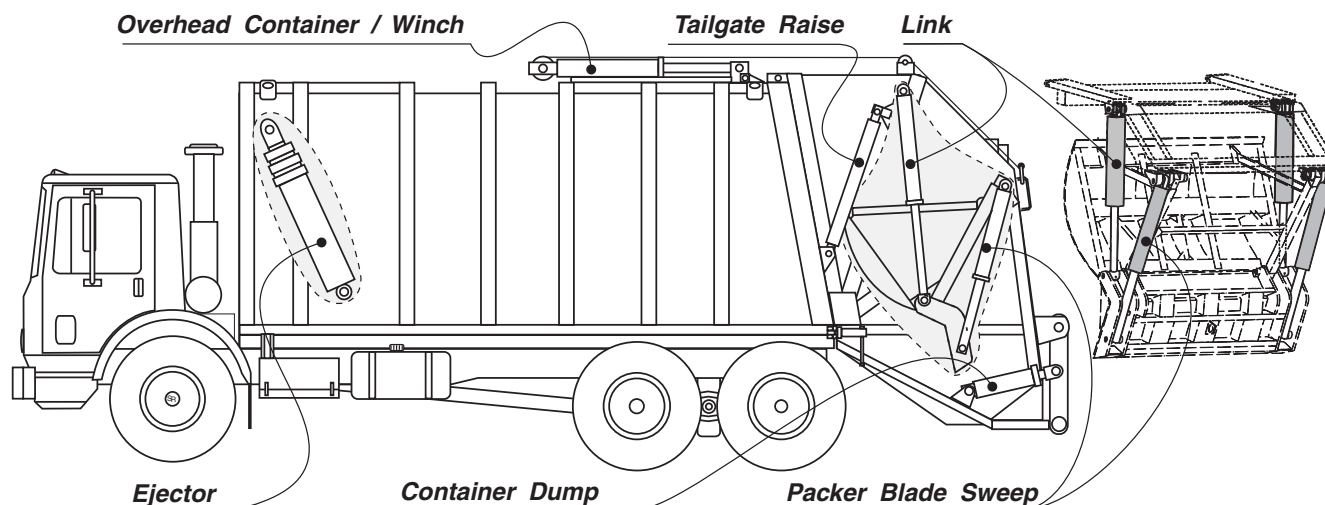
Dempster DM2 Front Loader



<u>Cylinder Function</u>	<u>Parker Eng#</u>	<u>Parker Number</u>	<u>Bore</u>	<u>Rod</u>	<u>Stroke</u>
Arm / Lift OEM Ref P.N.'s; DB8752, AB29244	D50CC-26-46.88	3777921078	5.00	2.50	46.88
Fork / Tilt OEM Ref P.N.'s; DB8651, AB29247	N/A		4.00	2.00	24.00
Fork / Tilt, with XHD Arms OEM Ref P.N.'s; AB19869TH	D40CD-10-24	3776821072	4.00	2.00	24.00
Top Door, Hinged OEM Ref P.N.'s; AB19774TH	D40CE-3-24	3776821073	4.00	2.00	24.00
Top Door, Sliding OEM Ref P.N.'s; AB28801	N/A	N/A	2.50	1.50	97.50
Tailgate Raise OEM Ref P.N.'s; AB28819	N/A		3.00	1.75	37.50
Packer Blade, Full Eject OEM Ref P.N.'s; DB9361, AB28805	SD63CD-1-177	3771433061	Telescopic		177.63
Packer Blade, Dump Type OEM Ref P.N.'s; AB28803, AB28973	N/A		6.00	4.50	71.50
Body Raise / Dump OEM Ref P.N.'s; AB29336	N/A		Telescopic		
Body Raise / Dump OEM Ref P.N.'s; DB8186	N/A		Telescopic		96.75

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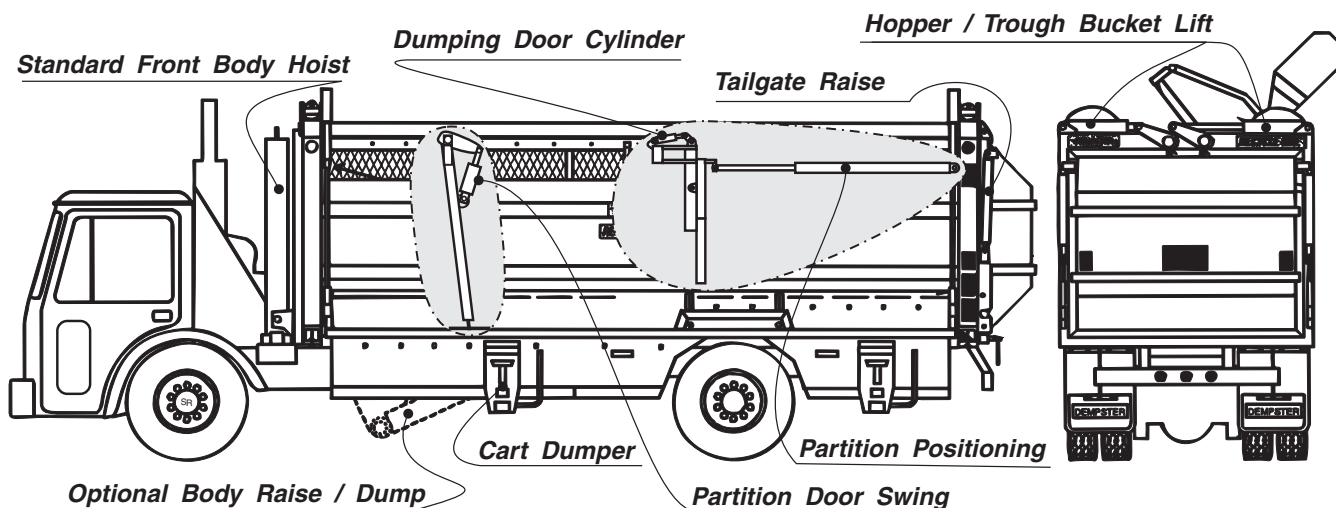
Dempster Routeking II Rear Loader



<u>Cylinder Function</u>	<u>Parker Eng#</u>	<u>Parker Number</u>	<u>Bore</u>	<u>Rod</u>	<u>Stroke</u>
Link / Blade OEM Ref P.N.'s: AB19600TH, AB26635TH, BB6997, BB8112, BB8133-1, DB8043	D60CD-5-34	3771421254	6.00	2.50	34.00
Blade / Sweep OEM Ref P.N.'s: AB19601TH, BB6996, BB8134-1, BB8235, DB8042	D50CB-8-27	3777921058	5.00	3.00	27.00
Tailgate Raise, Old Style OEM Ref P.N.'s: AB19602TH, BB6888, BB8281-1	D35CC-18-36.88	3773821055	3.50	2.50	37.00
Tailgate Raise, New Style OEM Ref P.N.'s: DB8044	S35CC-4-37	3776815004	3.50	2.50	37.00
Overhead Container Winch Reeving OEM Ref P.N.'s: BB8206	D60CB-6-56.50	3771421236	6.00	3.00	56.50
Ejector Push Out, 16 Yd OEM Ref P.N.'s: BB6201, CB7772	SD63CC-11-73	3771433025	Telescopic		73.00
Ejector Push Out, 20 Yd OEM Ref P.N.'s: AB17924, BB6087, BB6199, Cb7770	SD63CC-11-96	3771433044	Telescopic		96.00
Ejector Push Out, 25 Yd OEM Ref P.N.'s: AB17564, BB6089, Bb6200, CB7771, DB9350	SD74CC-11-131	3772534032	Telescopic		131.50
Ejector Push Out, 32 Yd OEM Ref P.N.'s: Ab19553, Bb9042,	SD86CC-2-177	3772936004	Telescopic		177.00

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Dempster Recycle-One Recycling Body
RCY ONE and RCY ONE-SYSTEM PLUS

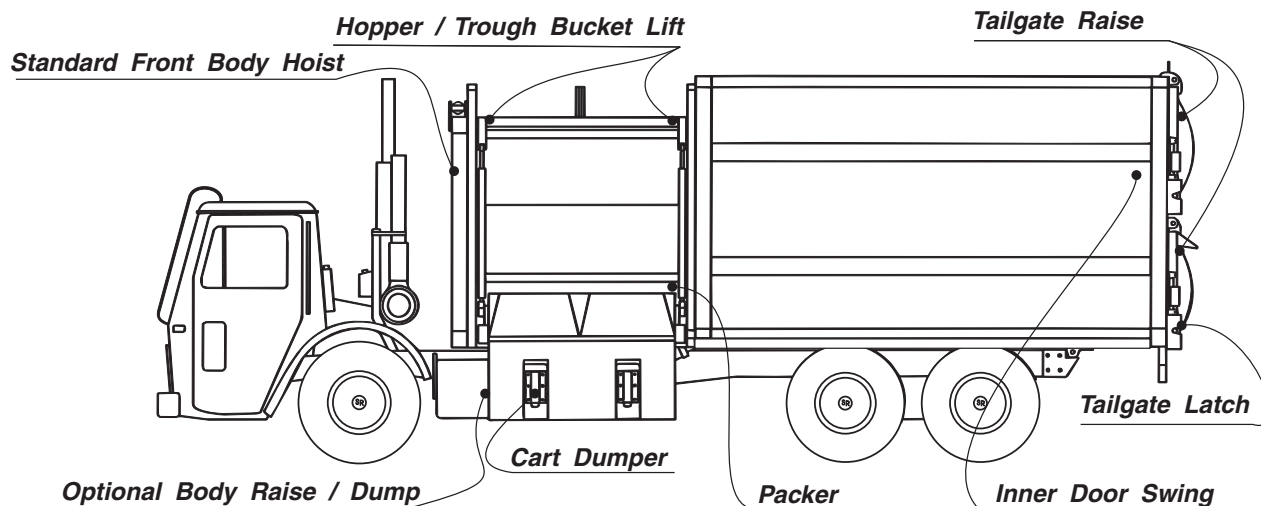


<u>Cylinder Function</u>	<u>Parker Eng#</u>	<u>Parker Number</u>	<u>Bore</u>	<u>Rod</u>	<u>Stroke</u>
Hopper / Trough Bucket Lift, Loading OEM Ref P.N.'s; DB8286	D40DD-16-22.50	3776821069	4.00	2.00	22.50
Partition Positioning, System Plus OEM Ref P.N.'s; AB29967	N/A				
Partition Door Swing, System Plus OEM Ref P.N.'s; AB29908	N/A		Hydraulic		
Partition Door Lock, System Plus OEM Ref P.N.'s; AB27369	N/A		Air Cylinder		
Partition Door Swing OEM Ref P.N.'s; DB8272	N/A		Air Cylinder		
Tailgate Raise, with Barrel Locks OEM Ref P.N.'s; AB12225, AB12265, AB12308, AB13978, AB29253	D25LL-12-16	3772621129	2.50	1.50	16.00
Tailgate Raise, with EZ-Locks OEM Ref P.N.'s; DB8362, AB29246	D25LL-16-24	3772621136	2.50	1.50	24.00
Cart Dumper OEM Ref P.N.'s; AA42109	N/A		Air Cylinder		
Cart Dumper, Cascade Carts OEM Ref P.N.'s; AB16141	N/A		Air Cylinder		
Cart Dumper, Waste Management OEM Ref P.N.'s; AB29003	N/A		Air Cylinder		
Body Raise / Dump, Front Mount OEM Ref P.N.'s; AB29334, DB8273, DB8318	S63MB-14-163.12	3771413254	Telescopic		163.12
Body Raise / Dump, Optional Underbody OEM Ref P.N.'s; DB8186	N/A		Telescopic		96.75

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Dempster Recycle-Pac, Recycling Body

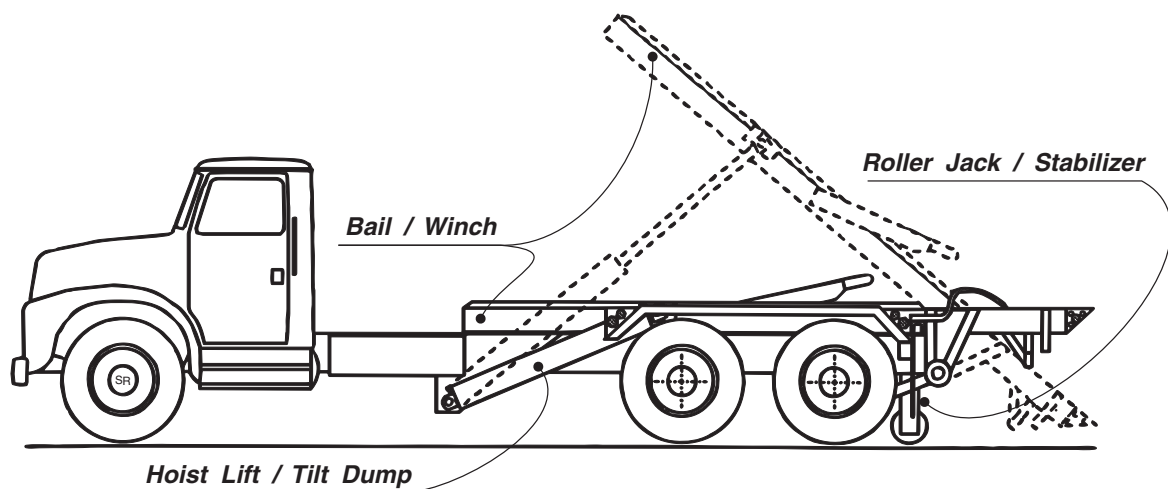
RCYC-I, RCYC-II and RCYC-III



<u>Cylinder Function</u>	<u>Parker Eng#</u>	<u>Parker Number</u>	<u>Bore</u>	<u>Rod</u>	<u>Stroke</u>
Hopper / Trough Bucket Lift, RCYC-I, II & III OEM Ref P.N.'s; DB8439, DB9467, AB29337	D40DD-19-22.50	3776821080	4.00	2.00	22.50
Packer, RCYC-I, II & III OEM Ref P.N.'s; DB8491, AB29264	D40DD-17-42	3776821070	4.00	2.50	42.00
Tailgate Raise, RCYC-I Barrel Locks OEM Ref P.N.'s; AB12225, AB12265, AB12308, AB13978, AB29253	D25LL-12-16	3772621129	2.50	1.50	16.00
Tailgate Raise, RCYC-I OEM Ref P.N.'s; DB8362, AB29246	D25LL-16-24	3772621136	2.50	1.50	24.00
Tailgate Inner Door Swing, RCYC-I OEM Ref P.N.'s; DB8272	N/A		Air Cylinder		
Tailgate Raise, RCYC-I EZ Locks OEM Ref P.N.'s; DB8362, AB29246	D25LL-16-24	3772621136	2.50	1.50	24.00
Tailgate Raise, RCYC-II & III EZ Locks OEM Ref P.N.'s; AB12225, AB12265, AB12308, AB13978, AB29253	D25LL-12-16	3772621129	2.50	1.50	16.00
Tailgate Latch, RCYC-II OEM Ref P.N.'s; AB29305	N/A	Air Cylinder	3.00	0.75	4.00
Body Raise / Dump, Front Mount, RCYC-I & II OEM Ref P.N.'s; DB8273, DB8318, AB29334	S63MB-14-163.12	3771413254	Telescopic		163.12
Body Raise / Dump, Underbody, RCYC-I, II & III OEM Ref P.N.'s; DB8809, DB9135, AB29335	S52DC-10-89.38	3771512077	Telescopic		89.38
Cart Dumper OEM Ref P.N.'s; AB16141	N/A		Air Cylinder		
Cart Dumper OEM Ref P.N.'s; AB29003	N/A		Air Cylinder		

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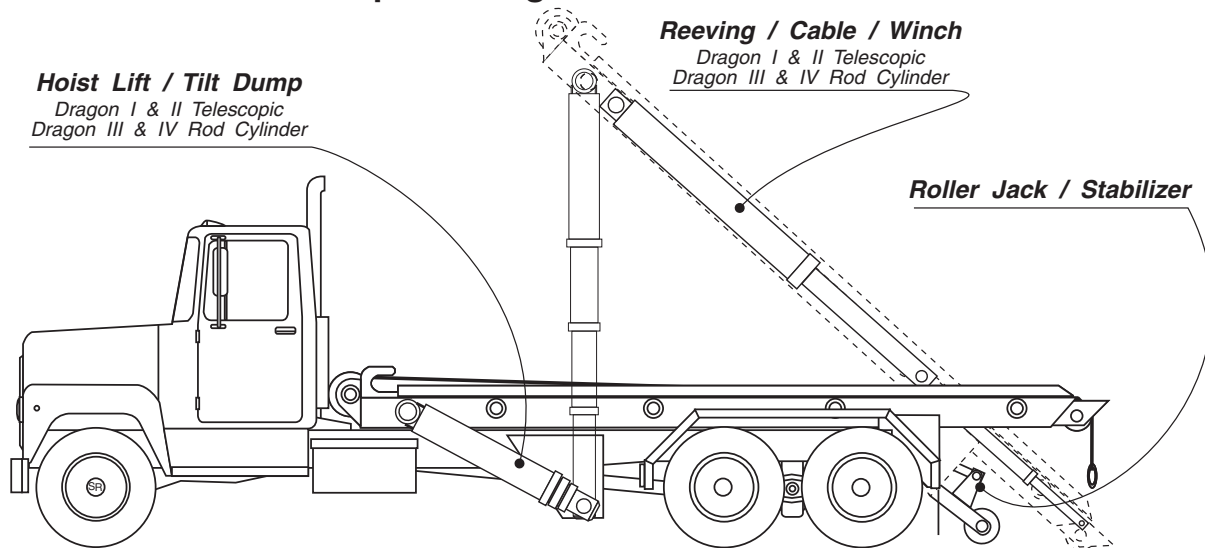
Dempster Dinosaur "Dino" Bail Hook Roll-Off



<u>Cylinder Function</u>	<u>Parker Eng#</u>	<u>Parker Number</u>	<u>Bore</u>	<u>Rod</u>	<u>Stroke</u>
Bail / Winch; 40,000# OEM Ref P.N.'s; BB8218, BB8219, CB3603, DB7693	B4964	3790004964	6.00	3.00	84.75
Bail / Winch; 50,000# OEM Ref P.N.'s; CB0796, CB6397, DB7695	D70CC-14-85	3773721112	7.00	3.00	85.00
Hoist Lift / Tilt Dump; 40,000# OEM Ref P.N.'s; CB3717, DB8052	B4807	3790004807	5.00	3.00	72.50
Hoist Lift / Tilt Dump; 50,000# OEM Ref P.N.'s; BB8212, BB8779, CB1757, DB8008	D60CC-41-68.50	3771421238	6.00	3.00	68.50
Roller Jack / Stabilizer OEM Ref P.N.'s; BB8181, DB7699	D52CB-31-6	3771521140	5.25	2.50	6.88

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Dempster Dragon Cable Roll-Off

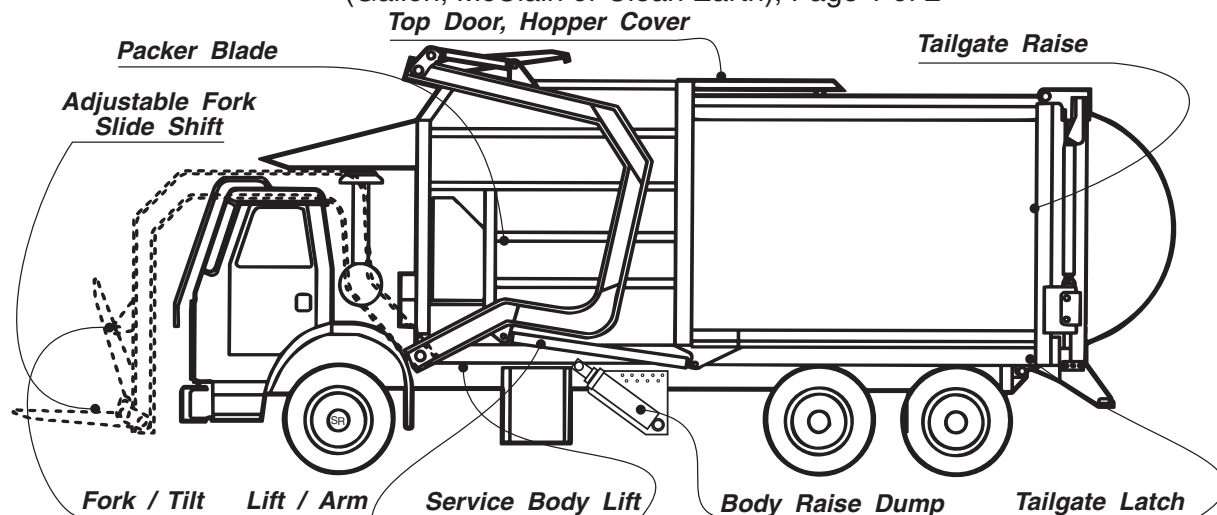


<u>Cylinder Function</u>	<u>Parker Eng#</u>	<u>Parker Number</u>	<u>Bore</u>	<u>Rod</u>	<u>Stroke</u>
Reeving / Cable / Winch; Dragon I & II OEM Ref P.N.'s; CB7478, CB7661, CB7877, CB7947	SD72AC-1-156	3772532018	Telescopic		156.00
Reeving / Cable / Winch; Dragon III & IV OEM Ref P.N.'s; DB7694, BB9290, AB19461	D3838	3790003838	6.00	3.00	76.00
Hoist Lift / Tilt Dump; Dragon I & II OEM Ref P.N.'s; CB7015, CB7781	SD53CC-16-111	3771533038	Telescopic		111.00
Hoist Lift / Tilt Dump; Dragon III & IV OEM Ref P.N.'s; DB7694, BB9290, AB19461	D3838	3790003838	6.00	3.00	76.00
Roller Jack / Stabilizer; Dragon 1&II OEM Ref P.N.'s; AB19462, AB19467	N/A		6.00	3.00	7.75

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E-Z Pack FL80, FLOO80 Hercules Front Loader

(Galion, McClain or Clean Earth), Page 1 of 2

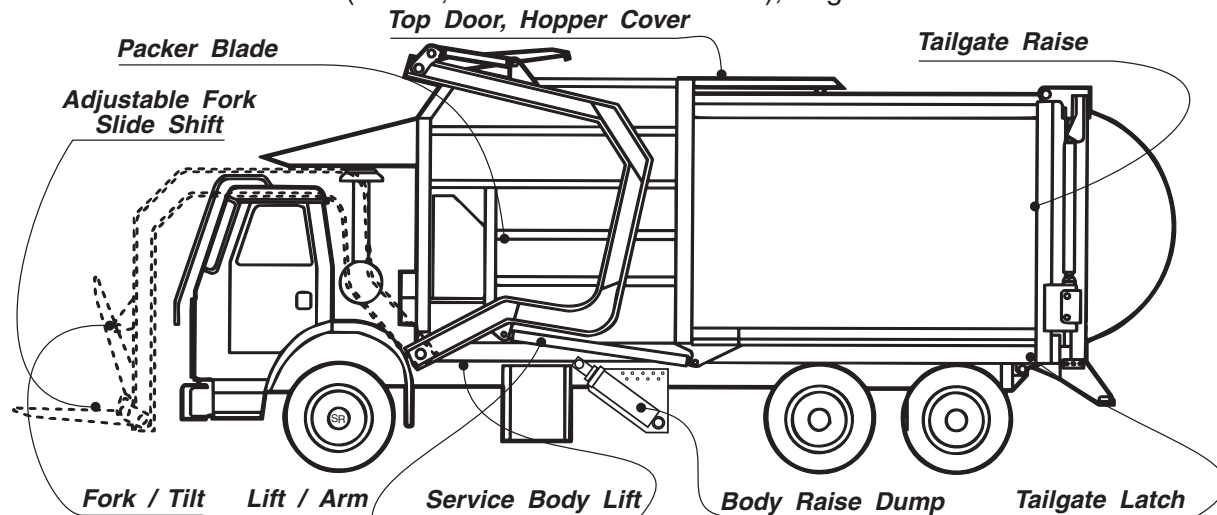


<u>Cylinder Function</u>	<u>Parker Eng#</u>	<u>Parker Number</u>	<u>Bore</u>	<u>Rod</u>	<u>Stroke</u>
Arm / Lift 1.50" Pins OEM Ref P.N.'s: 20-46119 4549DA, 20-46163 D4549ADA, 20-46171 D4549BDA, 20-49273 D4549EDA, 20-52344 K4549LDA	D45CD-5-49.12	3774121048	4.50	2.00	49.13
Arm / Lift 2.00" Pins OEM Ref P.N.'s: 21-05358 K4549MDA, 21-15641 C4549NDA	D45CD-4-49.12	3774121047	4.50	2.00	49.13
Fork / Tilt OEM Ref P.N.'s: 20-46012 3516BDA, 20-46142 D3516CDA, 20-49952 D3516JDA, 20-49999 D3516KDA, 20-52345 K3516LDA	D35LD-6-16.50	3774021019	3.50	1.75	16.50
Fork / Tilt OEM Ref P.N.'s: 20-47868 D3523DA, 20-49272 D3523BDA, 20-52346 K3523FDA	D35LD-3-23.25	3774021004	3.50	1.75	23.50
Fork / Tilt OEM Ref P.N.'s: 20-48524 D4016DA, 20-52356 K4016FDA	D40LD-2-16.5	3776821020	4.00	2.00	16.50
Fork / Tilt OEM Ref P.N.'s: 21-09213 K4022BDA, 21-15775 C4022CDA	D40LD-12-21.75	3776821117	4.00	2.00	21.75
Fork / Tilt, #8 SAE O-Ring Ports OEM Ref P.N.'s: 21-03153 K4025JDA	D40LD-10-24.75	3776821110	4.00	2.00	24.75
Fork / Tilt, #16 SAE O-Ring Ports OEM Ref P.N.'s: 21-09228 K4025KDA, 21-15642 C4025RDA	D40LD-11-24.75	3776821112	4.00	2.00	24.75
Fork / Tilt, 2 Position OEM Ref P.N.'s: 21-10044 K4025LDA, 21-14679 C4025PDA	D40LD-6-24.75	3776821044	4.00	2.00	24.75
Top Door, Sliding 34 YD OEM Ref P.N.'s: 20-46008 2563ADA, 20-46141 D2563BDA, 20-52362 K2563EDA	D25DD-5-63	3772621138	2.50	1.75	63.00
Top Door, Sliding 40 YD OEM Ref P.N.'s: 20-48520 D3089DA, 20-52348 K3089ADA 21-15646 C3089BDA	D30DD-15-89	3770521049	3.00	2.00	63.00
Top Door, Hinged OEM Ref P.N.'s: 20-46155 D4021JDA, 20-52357 K4021NDA	D40DD-10-21.62	3770521116	4.00	2.50	21.63
Tailgate Raise OEM Ref P.N.'s: 20-47048 D3033ADA, 20-52347 K3033DDA, 21-15644 C3033EDA	D30LD-8-33.38	3770521123	3.00	1.75	33.38
Tailgate Raise OEM Ref P.N.'s: 2534DAA 20-41382, 20-46157 D2534CDA	N/A	N/A	2.50	1.75	34.00

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E-Z Pack FL80, FLOO80 Hercules Front Loader

(Galion, McClain or Clean Earth), Page 2 of 2

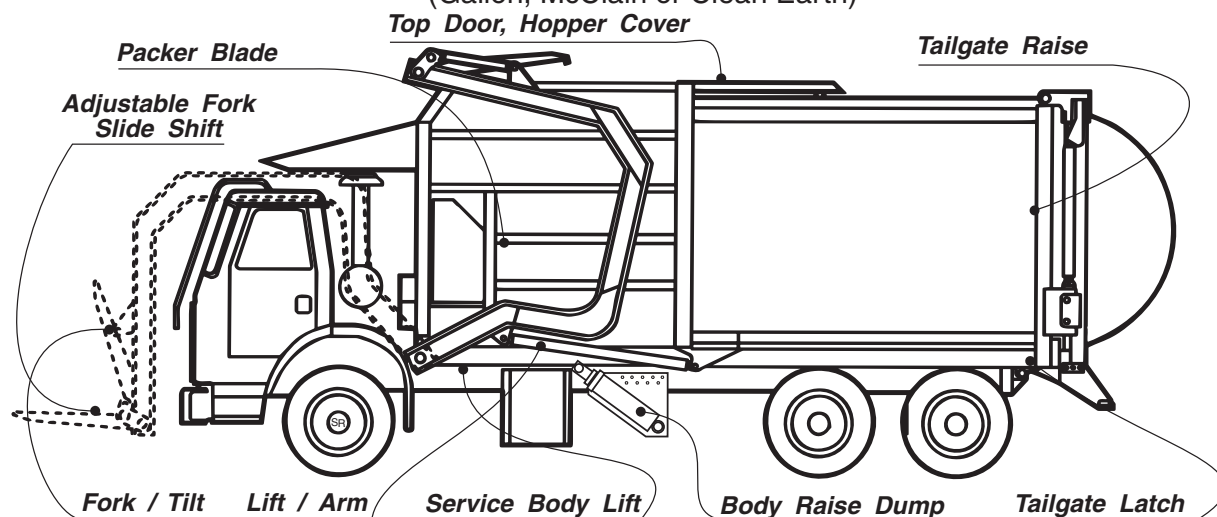


<u>Cylinder Function</u>	<u>Parker Eng#</u>	<u>Parker Number</u>	<u>Bore</u>	<u>Rod</u>	<u>Stroke</u>
Packer Blade, 34 Yd Full Eject OEM Ref P.N.'s: 21-04536 K63133DDA, 21-15773 C63133EDA, 70-1601 D63133DA, 70-1627 C63133ADA, 70-1731 K63133CDA	SD63CB-26-132.75	3771433930	Telescopic		132.75
Packer Blade, 40 Yd Full Eject OEM Ref P.N.'s: 21-04537 K63167FDA, 21-15770 C63167HDA, 70-1592 D63167DA, 70-1619 C63167BDA, 70-1730 K63167DDA	SD63CB-26-167	3771433925	Telescopic		167.00
Packer Blade, 45 Yd Full Eject OEM Ref P.N.'s: 21-01987 K63198ADA, 21-04538 K63198BDA, 21-15772 C63198DDA	SD63CB-26-197	3771433931	Telescopic		197.00
Packer Blade, 40 Yd Full Eject Spherical Bearings OEM Ref P.N.'s: 21-06096 K63167GDA, 21-15771 C63167JDA	SD63CB-27-167	3771433935	Telescopic		167.00
Packer Blade, 45 Yd Full Eject Spherical Bearings OEM Ref P.N.'s: 21-06097 K63198CDA	SD63CB-27-195	3771433936	Telescopic		197.00
Packer Blade, Gravity Dump OEM Ref P.N.'s: 20-45450 6067DA, 20-46139 D6067ADA, 20-49142 D6067BDA, 20-49480 D6067EDA, 20-52349 K6067GDA, 21-07940 K6067HDA, 21-12474 K6067JDA	D60DB-16-67.5	3771421181	6.00	5.00	67.50
Body Raise, Gravity Dump OEM Ref P.N.'s: 21-01493 K5365B, 70-1670 C5365K	S53DC-18-64.75	3771513098	Telescopic		64.75
Body Raise / Gravity Dump OEM Ref P.N.'s: 70-1259 5381B, 70-1487 D5381G, 70-1653 C5381K, 70-1732 K5381N	S53DC-70-80.75	3771513187	Telescopic		80.75
Service Body Lift OEM Ref P.N.'s: 20-04001 3024CDA	3782000014	3782000014	3.50	2.00	24.00
Cab Shield OEM Ref P.N.'s: 20-46167 D1510, 20-45588	N/A	N/A	1.50	1.00	10.00

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E-Z Pack FL10, FLOO10 Hercules Front Loader

(Galion, McClain or Clean Earth)

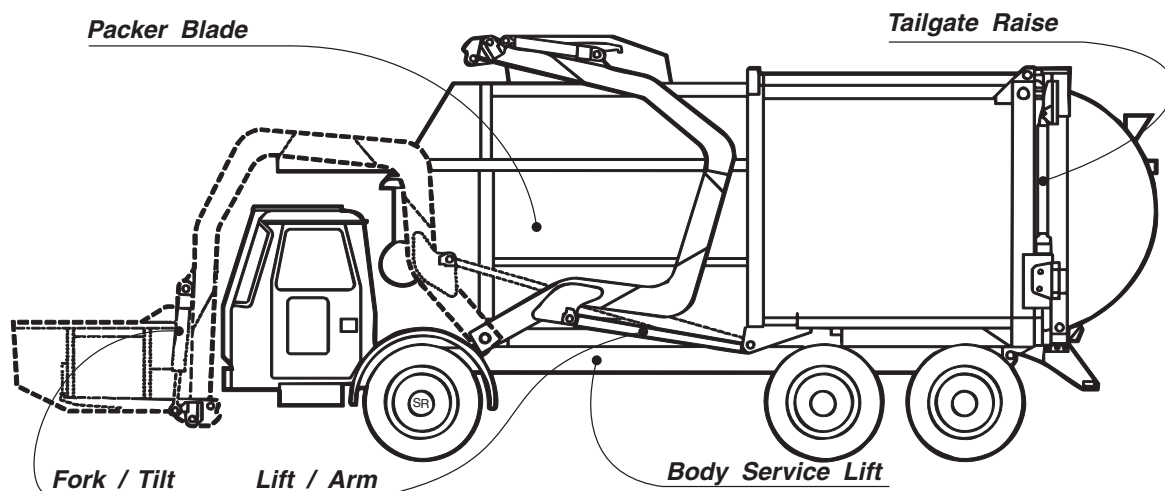


<u>Cylinder Function</u>	<u>Parker Eng#</u>	<u>Parker Number</u>	<u>Bore</u>	<u>Rod</u>	<u>Stroke</u>
Arm / Lift, 10,000# Lift OEM Ref P.N.'s: 20-48519 D5549DA, 20-52355 K5549ADA 21-12851 K5549BDA, 21-15639 C5549CDA	D55CC-12-49.12	3771921050	5.50	3.00	49.13
Fork / Tilt, 10,000# Lift OEM Ref P.N.'s: 21-03390 K4525DA, 21-09229 K4525ADA 21-15640 C4525BDA	D45LD-6-24	3774121017	4.50	2.00	24.75
Fork / Tilt, 10,000# Lift OEM Ref P.N.'s: 21-09214 K4522KDA, 21-15774 C4522LOA	D45LD-8-21.75	3774121051	4.50	2.00	21.75
Top Door, Sliding 30 & 34 YD OEM Ref P.N.'s: 20-46008 2563ADA, 20-46141 D2563BDA, 20-52362 K2563EDA	D25DD-5-63	3772621138	2.50	1.75	63.00
Top Door, Sliding 40 & 45 YD OEM Ref P.N.'s: 20-48520 D3089DA, 20-52348 K3089ADA 21-15646 C3089BDA	D30DD-15-89	3770521116	3.00	2.00	63.00
Tailgate Raise OEM Ref P.N.'s: 20-47048 D3033ADA, 20-52347 K3033DDA, 21-15644 C3033EDA	D30LD-8-33.38	3770521123	3.00	1.75	33.38
Packer Blade, 34 Yd Full Eject OEM Ref P.N.'s: 21-04536 K63133DDA, 21-15773 C63133EDA, 70-1601 D63133DA, 70-1627 C63133ADA, 70-1731 K63133CDA	SD63CB-26-132.75	3771433930	Telescopic		132.75
Packer Blade, 40 Yd Full Eject OEM Ref P.N.'s: 21-04537 K63167FDA, 21-15770 C63167HDA, 70-1592 D63167DA, 70-1619 C63167BDA, 70-1730 K63167DDA	SD63CB-26-167	3771433925	Telescopic		167.00
Packer Blade, 45 Yd Full Eject OEM Ref P.N.'s: 21-01987 K63198ADA, 21-04538 K63198BDA, 21-15772 C63198DDA	SD63CB-26-197	3771433931	Telescopic		197.00
Packer Blade, 40 Yd Full Eject Spherical Bearings OEM Ref P.N.'s: 21-06096 K63167GDA, 21-15771 C63167JDA	SD63CB-27-167	3771433935	Telescopic		167.00
Packer Blade, 45 Yd Full Eject Spherical Bearings OEM Ref P.N.'s: 21-06097 K63198CDA	SD63CB-27-195	3771433936	Telescopic		197.00

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E-Z Pack FLFR Residential Front Loader

(Galion, McClain or Clean Earth)

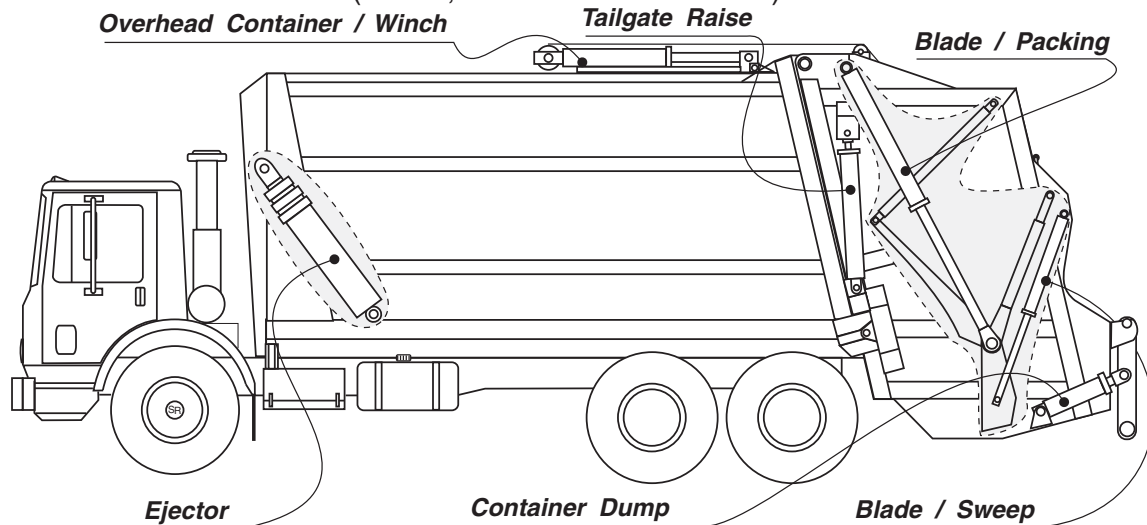


<u>Cylinder Function</u>	<u>Parker Eng#</u>	<u>Parker Number</u>	<u>Bore</u>	<u>Rod</u>	<u>Stroke</u>
Arm / Lift; 6000# OEM Ref P.N.'s; 21-03855 K3551ADA 21-15643 C3551BDA	D35CD-7-51.31	3774021009	3.50	2.00	51.31
Arm / Lift; 8000# OEM Ref P.N.'s; 21-06343 K4551CDA 21-15645 C4551EDA	D45CD-4-51.31	3774121050	4.50	2.00	51.31
Fork / Tilt; 6000# OEM Ref P.N.'s; 21-07434 K3025CDA	D30LD-4-24	3770521071	3.00	1.75	24.75
Fork / Tilt; 8000# OEM Ref P.N.'s; 21-09228 K4025KDA, 21-15642 C4025RDA	D40LD-11-24.75	3776821112	4.00	2.00	24.75
Tailgate Raise OEM Ref P.N.'s; 20-47048 D3033ADA, 20-52347 K3033DDA, 21-15644 C3033EDA	D30LD-8-33.38	3770521123	3.00	1.75	33.38
Packer Blade, 2.00" Dia. Pin x 3.00" Wide Lug OEM Ref P.N.'s; 21-11441 K52133ADA 21-15777 C52133BDA	SD52CB-10-132.19	3771532073	Telescopic		132.19
Packer Blade, 1.985" Dia. Pin x 2.00" Wide Lug OEM Ref P.N.'s; 21-03854 K52133DA 21-16048 C52133CDA	SD52CB-6-132.75	3771532057	Telescopic		132.19
Packer Blade, 2.00" Wide Bearing OEM Ref P.N.'s; 21-04537 K63167FDA, 21-15770 C63167HDA, 70-1592 D63167DA, 70-1619 C63167BDA, 70-1730 K63167DDA	SD63CB-26-167	3771433925	Telescopic		167.00
Packer Blade, 3.00" Wide Bearing OEM Ref P.N.'s; 21-06096 K63167GDA, 21-15771 C63167JDA	SD63CB-27-167	3771433935	Telescopic		167.00
Body Service Lift OEM Ref P.N.'s; 20-04001 3024CDA NOTE: Must Replace as a Set	3782000014	3782000014	3.50	2.00	24.00

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E-Z Pack G370 Goliath Rear Loader

(Galion, McClain or Clean Earth)

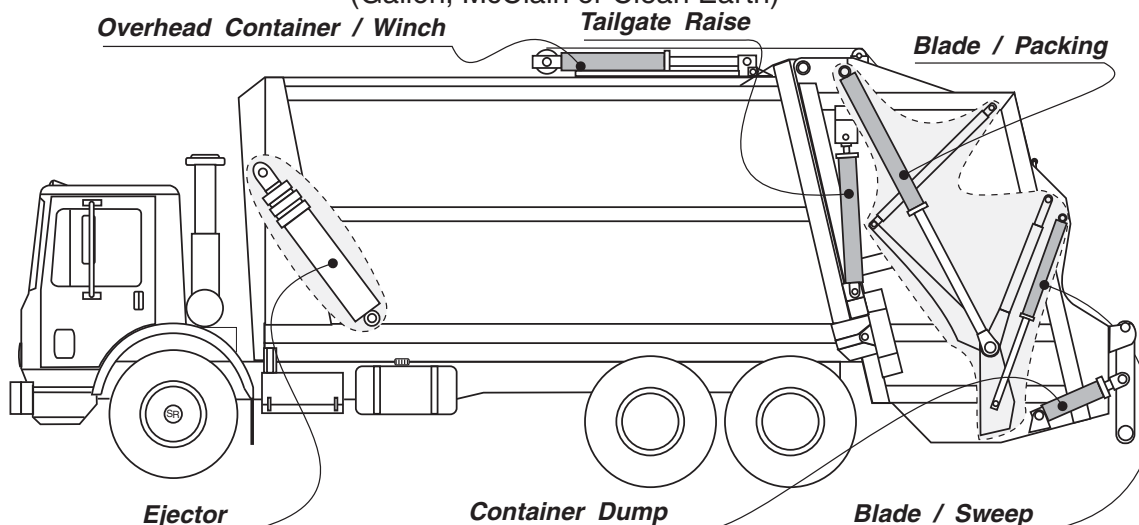


<u>Cylinder Function</u>	<u>Parker Eng#</u>	<u>Parker Number</u>	<u>Bore</u>	<u>Rod</u>	<u>Stroke</u>
Blade / Packing OEM Ref P.N.'s; 20-44095 6042DA, 20-44973 6042ADA, 20-46077 D6042BDA, 20-47092 D6042CDA, 20-48279 D6042DDA, 20-49898 D6042HDA, 21-01530 K6042LDA, 21-14659 C6042MDA	D60DC-12-42.62	3771421240	6.00	2.75	42.63
Blade / Sweep OEM Ref P.N.'s; 20-43726 4028DA, 20-44969 4028BDA, 20-46076 D4028DDA, 20-46382 D4028EDA, 20-47091 D4028FDA, 20-49897 D4028KDA, 21-01531 K4028LDA, 21-14658 C4028MDA	D40DB-7-28.5	3776821123	4.00	2.75	28.50
Blade / Sweep, Tag Axle Tailgate OEM Ref P.N.'s; 21-02610 K4025GDA, 21-14661 C4025NDA	D40DB-7-25.62	3776821122	4.00	2.75	25.62
Tailgate Raise OEM Ref P.N.'s; 20-44125 4035CDA, 20-45169 4035EDA, 20-46249 D4035HDA, 20-47090 D4035JDA, 21-01532 K4035LDA, 21-14660 C4035MDA	D40LB-2-35.31	3776821105	4.00	2.50	35.31
Overhead Container Winch Reeving OEM Ref P.N.'s; 20-46332 D6060DA, 21-02830 K6060CDA, 21-14667 C6060DDA	D60DC-8-60	3771421161	6.00	2.75	60.00
Container Dump OEM Ref P.N.'s; 21-02804 K3015GDA, 21-14668 C3015HDA	D30DL-2-15.375	3770521054	3.00	1.25	15.38
Ejector Push Out, 16 Yd OEM Ref P.N.'s; 21-01365 K6270ADA, 70-1579 D6270DA	SD62CC-23-70	3771432062	Telescopic		70.50
Ejector Push Out, 18 Yd OEM Ref P.N.'s; 21-01366 K6281ADA, 21-14665 C6281BDA, 70-1617 D6281DA	SD62CC-23-81	3771432061	Telescopic		81.50
Ejector Push Out, 20 Yd OEM Ref P.N.'s; 21-01367 K6292JDA, 21-14664 C6292KDA, 70-1464 C6292BDA, 70-1507 D6292CDA, 70-1547 D6292EDA, 70-1618 C6292HDA	SD62CC-23-92	3771432060	Telescopic		92.50
Ejector Push Out, 25 Yd OEM Ref P.N.'s; 21-01368 K63124LDA, 21-14663 C63124MDA, 70-1465 63124DDA, 70-1478 D63124FDA, 70-1548 D63124HDA, 70-1727 C63124HDA, 70-1616 C63124JDA	SD63CC-28-124	3771433072	Telescopic		124.50
Ejector Push Out, 31 Yd OEM Ref P.N.'s; 21-01369 K74162CDA, 21-14662 C74162EDA, 70-1422 74162DA, 70-1508 D74162ADA, 70-1546 D74162BDA, 70-1631 C74162DDA	SD74CC-13-162.88	3772534042	Telescopic		163.00

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E-Z Pack G300 Goliath II Rear Loader

(Galion, McClain or Clean Earth)

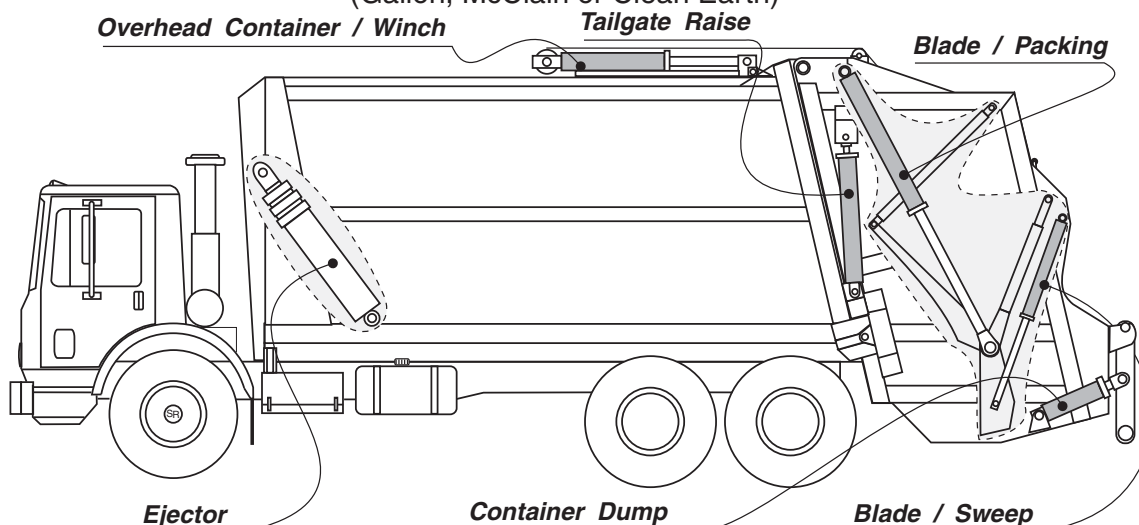


<u>Cylinder Function</u>	<u>Parker Eng#</u>	<u>Parker Number</u>	<u>Bore</u>	<u>Rod</u>	<u>Stroke</u>
Blade / Packing OEM Ref P.N.'s; 21-01954 K5538CDA, 20-49774 D5538ADA, 21-14635 C5538DDA	D55CC-2-38.31	3771921030	5.50	2.50	38.31
Blade / Sweep OEM Ref P.N.'s; 21-01883 K4025FDA, 20-49775 D4025ADA, 21-14634 C4025MDA	D40CC-16-24.81	3776821024	4.00	2.50	24.81
Tailgate Raise, With Automatic Locks OEM Ref P.N.'s; 21-01947 K3031CDA	D30LC-2-31.5	3770521105	3.00	2.00	31.50
Tailgate Raise, With Turnbuckles OEM Ref P.N.'s; 21-01646 K3127E, 70-1595, D3127A	S31LC-2-27.5	3770711030	3.25	2.75	27.50
Overhead Container Winch Reeving OEM Ref P.N.'s; 20-46332 D6060DA, 21-02830 K6060CDA, 21-14667 C6060DDA	D60DC-8-60	3771421161	6.00	2.75	60.00
Container Dump OEM Ref P.N.'s; 21-02804 K3015GDA, 21-14668 C3015HDA	D30DL-2-15.375	3770521054	3.00	1.25	15.38
Ejector Push Out, 18 Yd OEM Ref P.N.'s; 21-01370 K6283CDA, 70-1687 C6283BDA, 70-1681 D6283ADA	SD62CC-24-82.5	3771432064	Telescopic		82.50
Ejector Push Out, 20 Yd OEM Ref P.N.'s; 21-01371 K6297BDA, 70-1688 C6297BDA, 70-1726 C6297CDA, 70-1682 D6297ADA	SD62CC-24-96.5	3771432063	Telescopic		96.50
Ejector Push Out, 25 Yd OEM Ref P.N.'s; 21-01765 K63129EDA, 70-1683 D63129ADA, 70-1689 C63129BDA, 70-1706 C63129CDA, 21-14639 C63129FDA	SD63CC-27-129	3771433074	Telescopic		129.00
Ejector Push Out, 31 Yd OEM Ref P.N.'s; 21-01374 K74168EDA 70-1685 D74168ADA, 70-1691 C74168BDA, 70-1725 C74168DDA, 21-14643 C74168FDA	SD74CC-15-167.50	3772534049	Telescopic		167.50

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E-Z Pack A300 Apollo Rear Loader

(Galion, McClain or Clean Earth)



<u>Cylinder Function</u>	<u>Parker Eng#</u>	<u>Parker Number</u>	<u>Bore</u>	<u>Rod</u>	<u>Stroke</u>
Blade / Packing OEM Ref P.N.'s; 21-01648 K4538FDA, 21-14653 C4538DDA	D45CC-3-38.31	3775221022	4.50	2.00	38.31
Blade / Sweep OEM Ref P.N.'s; 21-01883 K4025FDA, 20-49775 D4025ADA, 21-14634 C4025MDA	D40CC-16-24.81	3776821024	4.00	2.50	24.81
Tailgate Raise, With Automatic Locks OEM Ref P.N.'s; 21-01947 K3031CDA	D30LC-2-31.5	3770521105	3.00	2.00	31.50
Tailgate Raise, With Turnbuckles OEM Ref P.N.'s; 21-01646 K3127E, 70-1595, D3127A	S31LC-2-27.5	3770711030	3.25	2.75	27.50
Overhead Container Winch Reeving OEM Ref P.N.'s; 20-46332 D6060DA, 21-02830 K6060CDA, 21-14667 C6060DDA	D60DC-8-60	3771421161	6.00	2.75	60.00
Container Dump OEM Ref P.N.'s; 21-02804 K3015GDA, 21-14668 C3015HDA	D30DL-2-15.375	3770521054	3.00	1.25	15.38
Ejector Push Out, 16 Yd OEM Ref P.N.'s; 21-01375 K5269DDA, 70-1612 D5269BDA, 70-1674 C5269CDA, 21-14654 C5269EDA	SD52CC-25-68.5	3771532053	Telescopic		68.50
Ejector Push Out, 18 Yd OEM Ref P.N.'s; 21-01376 K5283DDA, 70-1600 D5283ADA, 70-1720 C5283BDA, 21-14655 C5283EDA	SD52CC-25-82.5	3771532054	Telescopic		82.50
Ejector Push Out, 20 Yd OEM Ref P.N.'s; 21-01377 K5297DDA, 70-1598 D5297ADA, 70-1622 C5297CDA, 21-14656 C5297EDA	SD52CC-25-96.5	3771532052	Telescopic		96.50
Ejector Push Out, 25 Yd OEM Ref P.N.'s; 21-01378 K53129DDA, 70-1599 D53129ADA, 70-1639 D53129BDA, 70-1705 C53129CDA, 21-14657 C53129EDA	SD53CC-30-129	3771533066	Telescopic		129.12

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E-Z Pack, C200 & M150 Rear Loader

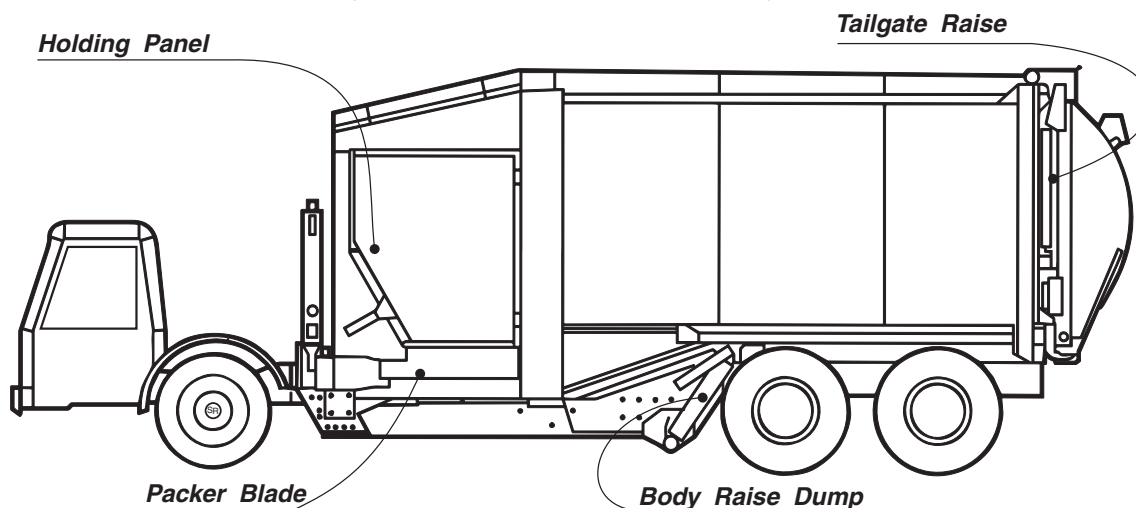
C200D & C200E Rear Loader

Cylinder Function	Parker Eng#	Parker Number	Bore	Rod	Stroke
Blade / Packing OEM Ref P.N.'s; 21-03472 K4030LDA, 21-01631 K4030JDA, 20-46153 D4030EDA, 20-47492 D4030FDA, 21-14671 C4030MDA	D40DL-2-30.38	3776821029	4.00	1.75	30.38
Blade / Sweep OEM Ref P.N.'s; 21-01630 K3021LDA, 20-46151 D3021GDA, 20-47491 D3021HDA, 21-14670 C3021MDA	D30DD-7-21.12	3770521057	3.00	1.75	21.13
Tailgate Raise; With Turnbuckles OEM Ref P.N.'s; 21-01629 K3128J, 70-1704 C3128G, 21-14672 C3128K, 70-1567 D3128D	S31LC-1-28.56	3770711027	3.25	2.75	28.56
Ejector Pust Out, 16 YD OEM Ref P.N.'s; 21-01379 K4257BDA, 70-1625 C4257ADA, 21-14674 C4257CDA, 70-1581 D4257DA	SD42CC-22-57	3771032027	Telescopic		57.00
Ejector Pust Out, 20 YD OEM Ref P.N.'s; 21-01381 K5292GDA, 70-1308 D5292DA, 70-1506 D5292CDA, 70-1566 D5292DDA, 70-1602 D5292EDA, 70-1621 C5292FDA	SD52CC-25-92.5	3771532055	Telescopic		92.50
Ejector Pust Out, 25 YD OEM Ref P.N.'s; 21-01382 K53117HDA, 70-1309 D53117DA, 70-1577 D53117DDA, 70-1626 C53117EDA, 21-14673 C53117JDA	SD53CC-30-117.25	3771533057	Telescopic		117.25

M150 Rear Loader

Cylinder Function	Parker Eng#	Parker Number	Bore	Rod	Stroke
Blade / Packing OEM Ref P.N.'s; 21-03471 K3526NDA, 21-01635 K3526LDA, 20-46152 D3526JDA, 21-14676 C3526PDA	D35DL-2-26.31	3774021006	3.50	1.75	26.31
Blade / Sweep OEM Ref P.N.'s; 21-01634 K3018GDA, 21-14675 C3018HDA	D30DD-6-18	3770521051	3.00	1.75	18.00
Tailgate Raise; With Turnbuckles OEM Ref P.N.'s; 21-01632 K2523D, 21-14677 C2523E	S31CC-24-23.56	3770711028	3.25	2.75	23.31
Ejector Pust Out, 14 YD OEM Ref P.N.'s; 21-01633 K5391CDA, 70-1504 D5391ADA, 21-14678 C5391EDA	SD53CC-29-91.50	3771533056	Telescopic		91.50

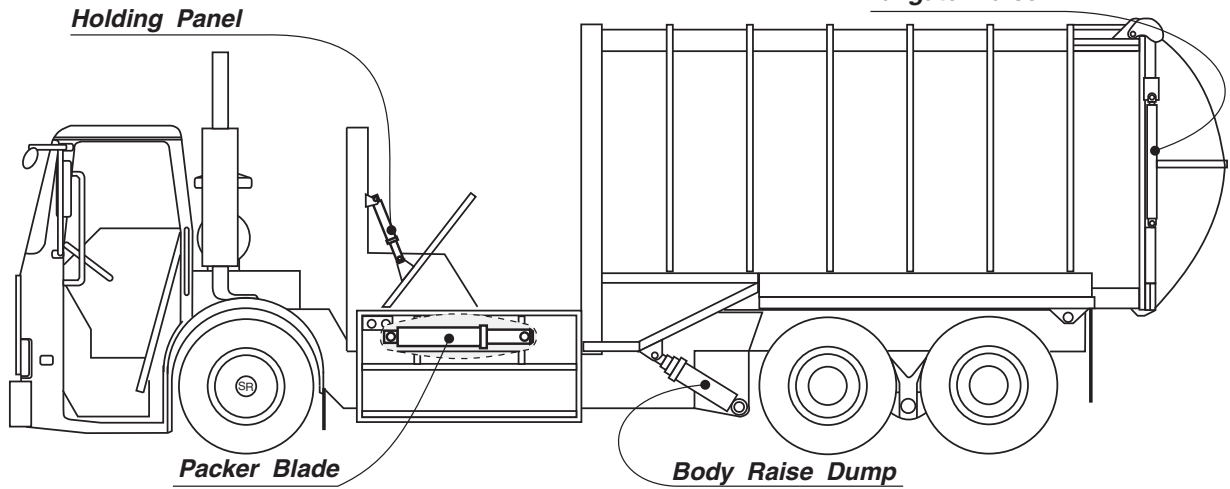
E-Z Pack SLB30, SLB35 & SLB40 One Man Side Loader
(Galion, McClain or Clean Earth)



<u>Cylinder Function</u>	<u>Parker Eng#</u>	<u>Parker Number</u>	<u>Bore</u>	<u>Rod</u>	<u>Stroke</u>
Packer Blade OEM Ref P.N.'s; K4042DDA 21-02832, 20-46159 D4042BDA, 20-47088 D4042CDA	D40CB-10-42	3776821106	4.00	2.50	42.00
Packer Blade OEM Ref P.N.'s; K5040BDA 21-10661, K5040ADA	D50CB-6-40	3777921028	5.00	4.00	40.00
Packer Blade OEM Ref P.N.'s; 21-06957 K4542DA	B5607	3790005607	4.50	3.00	41.44
Holding Panel, Crusher Panel OEM Ref P.N.'s; 21-07434 K3025CDA	D30LD-4-24	3770521071	3.00	1.75	24.75
Holding Panel, Crusher Panel OEM Ref P.N.'s; 21-02833 K3514DDA, 20-48858 D3514CDA	D35DB-2-14.25	3774021007	3.50	2.50	14.25
Tailgate Raise OEM Ref P.N.'s; 20-47048 D3033ADA, 20-52347 K3033DDA, 21-15644 C3033EDA	D30LD-8-33.38	3770521123	3.00	1.75	33.38
Body Raise / Dump 30 Yard Body OEM Ref P.N.'s; 21-11905 K5365CDA	S53DC-21-65	3771513142	Telescopic		65.00
Body Raise / Dump 35 Yard Body OEM Ref P.N.'s; 21-11904 K5381XDA, 21-15649 C5381ZDA	S53DC-21-81	3771513143	Telescopic		81.00
Body Raise / Dump 40Yard Body OEM Ref P.N.'s; 21-11903 K6499ADA	S64DC-11-99	3771414048	Telescopic		99.00

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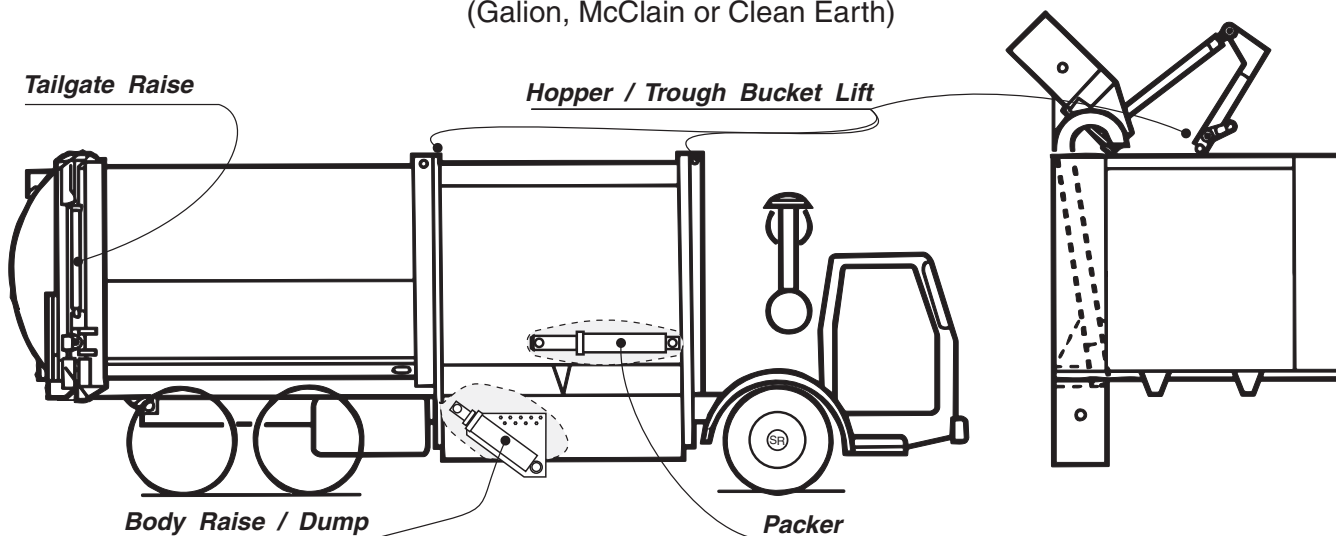
(Galion, McClain or Clean Earth)



<u>Cylinder Function</u>	<u>Parker Eng#</u>	<u>Parker Number</u>	<u>Bore</u>	<u>Rod</u>	<u>Stroke</u>
Packer Blade OEM Ref P.N.'s; K4042DDA 21-02832, 20-46159 D4042BDA, 20-47088 D4042CDA	D40CB-10-42	3776821106	4.00	2.50	42.00
Holding Panel, Crusher Panel OEM Ref P.N.'s; 21-02833 K3514DDA, 20-48858 D3514CDA	D35DB-2-14.25	3774021007	3.50	2.50	14.25
Tailgate Raise OEM Ref P.N.'s; 20-47048 D3033ADA, 20-52347 K3033DDA, 21-15644 C3033EDA	D30LD-8-33.38	3770521123	3.00	1.75	33.38
Body Raise / Dump; Single Axle OEM Ref P.N.'s; 21-01644 K5253A	S52DB-7-53.62	3771512052	Telescopic		53.62
Body Raise / Dump; Dual Axle OEM Ref P.N.'s; 21-01819 K5382V, 70-1668 C5382D, 70-1668 C5382D	S53DB-24-82	3771513185	Telescopic		82.75

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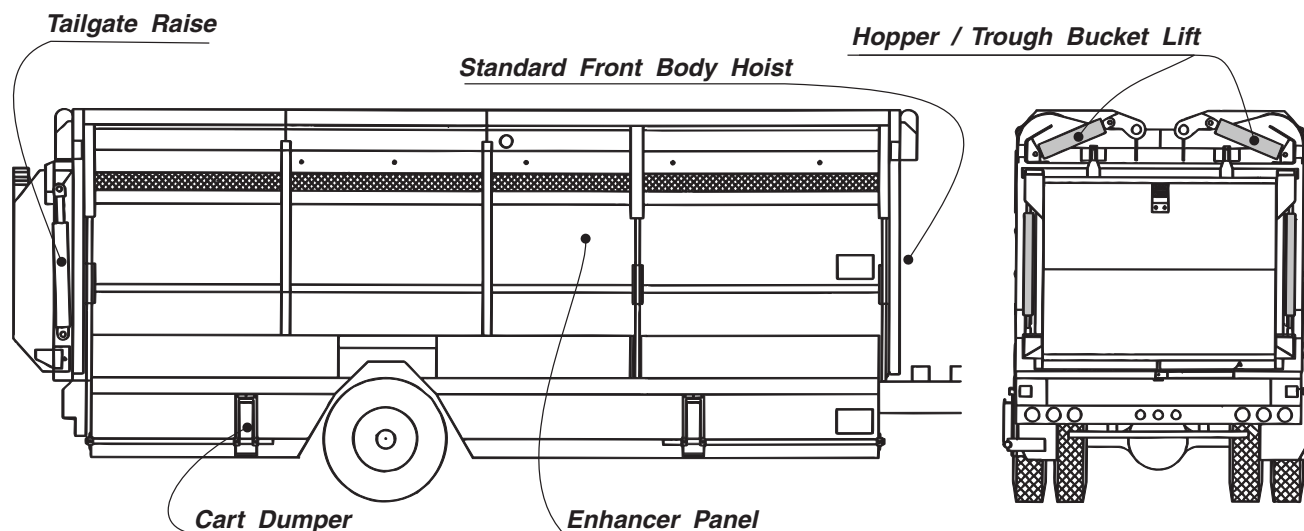
E-Z Pack HCR-34, HCR-37 & HCR-40 High Capacity Recycler
(Galion, McClain or Clean Earth)



<u>Cylinder Function</u>	<u>Parker Eng#</u>	<u>Parker Number</u>	<u>Bore</u>	<u>Rod</u>	<u>Stroke</u>
Hopper / Trough Bucket Lift OEM Ref P.N.'s; 21-04945 K3023EDA, 21-04533 K3023DDA, 20-49348 D3023BDA, 21-15647 C3023GDA	D30DD-9-23	3770521067	3.00	1.25	23.00
Packer OEM Ref P.N.'s; 21-02832 K4042DDA, 20-46159 D4042BDA, 20-47088 D4042CDA	D40CB-10-42	3776821106	4.00	2.50	42.00
Packer OEM Ref P.N.'s; 21-03228 K5042ADA, 21-15648 C5042BDA	D50CB-3-42	3777921005	5.00	2.50	42.00
Tailgate Raise OEM Ref P.N.'s; 20-52347 K3033DDA, 20-47048 D3033ADA, 21-15644 C3033EDA	D30LD-8-33.38	3770521123	3.00	1.75	33.38
Body Raise / Dump, HCR-34 & HCR-37 OEM Ref P.N.'s; 21-02113 K5371J, 70-1664 D5371G, 70-1667 C5371H	S53DB-24-71	3771513184	Telescopic		71.13
Body Raise / Dump, HCR-40 OEM Ref P.N.'s; 21-02112 K5390B, 70-1722 C5390A	S53DB-24-92	3771513186	Telescopic		91.13

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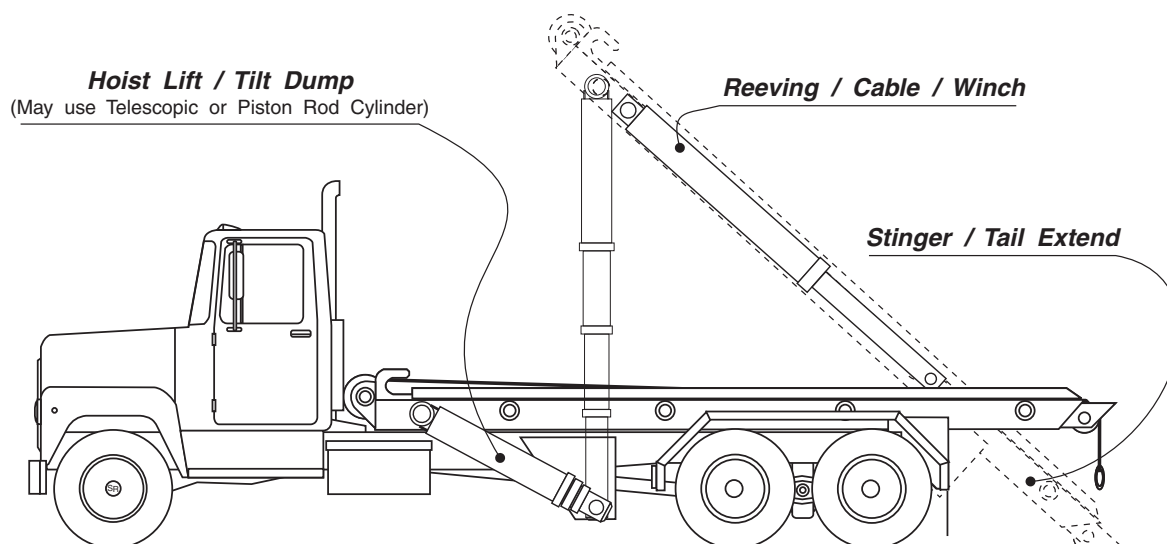
G-S Products GS-5700 Recycling Body



<u>Cylinder Function</u>	<u>Parker Eng#</u>	<u>Parker Number</u>	<u>Bore</u>	<u>Rod</u>	<u>Stroke</u>
Hopper / Trough Bucket Lift, Loading OEM Ref P.N.'s; 11071	D45CC-18-16.00	3774121040	4.50	2.00	16.00
Enhancer Panel / Packer OEM Ref P.N.'s; 11085	D40CC-26-69.00	3770821049	4.00	2.00	69.00
Enhancer Panel / Packer OEM Ref P.N.'s; 11080	D40CC-26-91.50	3770821048	4.00	2.00	91.50
Panel, Air Cylinder OEM Ref P.N.'s; 11086	N/A	Air Cylinder			
Tailgate Raise OEM Ref P.N.'s; 11041	N/A				
Body Raise / Dump, Front Mount OEM Ref P.N.'s; 12211	N/A				

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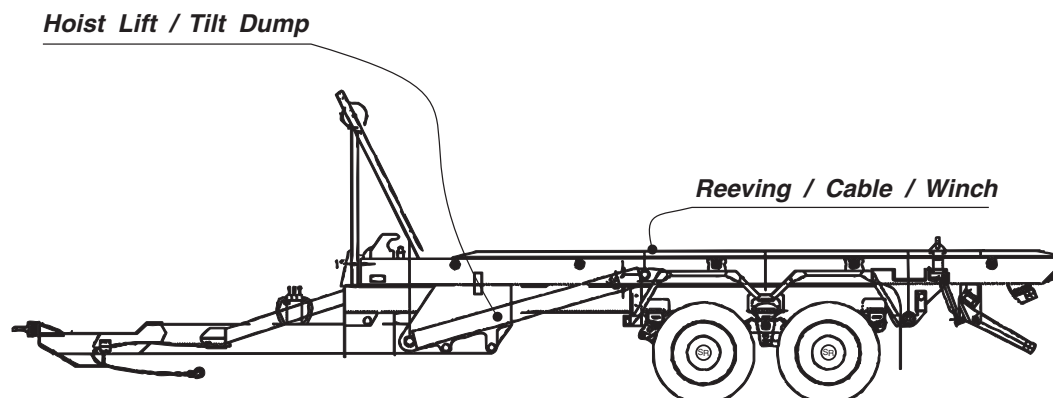
G & H Manufacturing 1500 & 1560 Roll-Off



<u>Cylinder Function</u>	<u>Parker Eng#</u>	<u>Parker Number</u>	<u>Bore</u>	<u>Rod</u>	<u>Stroke</u>
Reeving / Cable / Winch; 1500 Mfg Pre 06/02 OEM Ref P.N.'s; H3291, P1331, PH-020-168 NPT Ports	D60DD-20-79	3771421260	6.00	4.00	79.00
Reeving / Cable / Winch; 1500 Mfg After 06/02 OEM Ref P.N.'s; FA1001 SAE Ports	D60DD-20-79	3771421260	6.00	4.00	79.00
Reeving / Cable / Winch; 1560 Mfg Pre 06/02 OEM Ref P.N.'s; H3292 NPT Ports	D70DD-9-79	3773721117	7.00	4.00	79.00
Reeving / Cable / Winch; 1560 Mfg After 06/02 OEM Ref P.N.'s; FA102 SAE Ports	D70DD-9-79	3773721117	7.00	4.00	79.00
Hoist Lift / Tilt Dump; 1500 Rod Type Mfg Pre 06/02 OEM Ref P.N.'s; H3291, P1331, PH-020-168 NPT Ports	D60DD-20-79	3771421260	6.00	4.00	79.00
Hoist Lift / Tilt Dump; 1500 Mfg After 06/02 OEM Ref P.N.'s; FA1001 SAE Ports	D60DD-20-79	3771421260	6.00	4.00	79.00
Hoist Lift / Tilt Dump; 1560 Rod Type Mfg Pre 06/02 OEM Ref P.N.'s; H3292 NPT Ports	D70DD-9-79	3773721117	7.00	4.00	79.00
Hoist Lift / Tilt Dump; 1560 Rod Type Mfg After 06/02 OEM Ref P.N.'s; H3292 SAE Ports	D70DD-9-79	3773721117	7.00	4.00	79.00
Hoist Lift / Tilt Dump; 1500 Telescopic OEM Ref P.N.'s;	SD62DB-6-79	3771432081	Telescopic		79.00
Hoist Lift / Tilt Dump; 1500 Telescopic OEM Ref P.N.'s; 020116, PH-020-116	SD63DB-20-115.81	3771433943	Telescopic		115.81
Hoist Lift / Tilt Dump; 1560 Telescopic OEM Ref P.N.'s; H2208	SD73DB-10-115	3772533078	Telescopic		115.75
Stinger Tail Extend OEM Ref P.N.'s; A1162	3782000052	3782000052	4.00	2.00	48.00
Stinger Tail Extend OEM Ref P.N.'s; A5340	D30DD-17-48	3770521119	3.50	1.50	48.00

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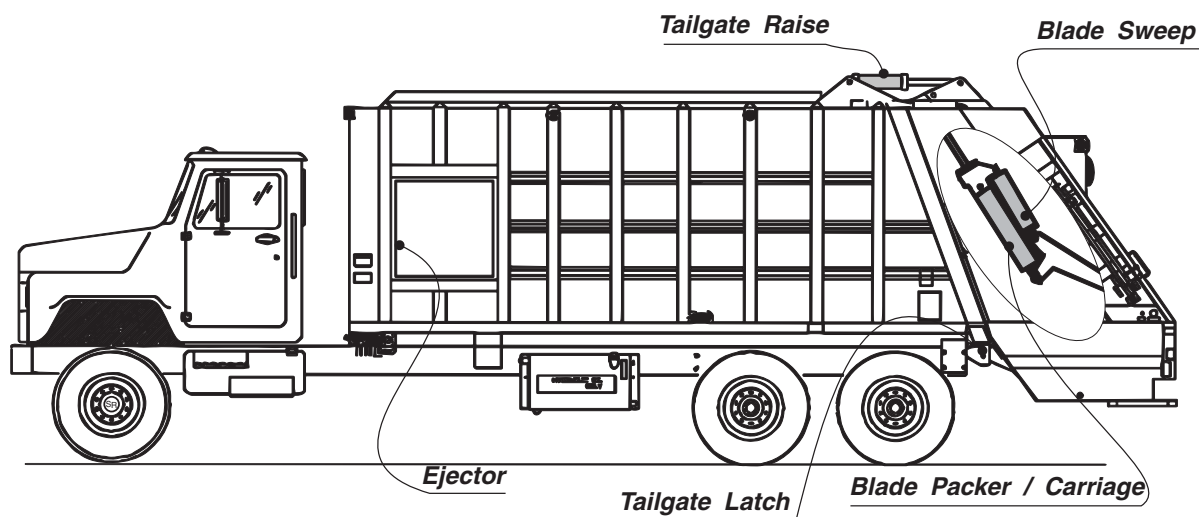
G & H Manufacturing 1700 Roll-Off Trailer



<u>Cylinder Function</u>	<u>Parker Eng#</u>	<u>Parker Number</u>	<u>Bore</u>	<u>Rod</u>	<u>Stroke</u>
Reeving / Cable / Winch; Mfg Pre 06/02 OEM Ref P.N.'s; H3291, P1331, PH-020-168 NPT Ports	D60DD-20-79	3771421260	6.00	4.00	79.00
Reeving / Cable / Winch; Mfg After 06/02 OEM Ref P.N.'s; FA1001 SAE Ports	D60DD-20-79	3771421260	6.00	4.00	79.00
Hoist Lift / Tilt Dump; Mfg Pre 06/02 OEM Ref P.N.'s; H3291, P1331, PH-020-168 NPT Ports	D60DD-20-79	3771421260	6.00	4.00	79.00
Hoist Lift / Tilt Dump; Mfg After 06/02 OEM Ref P.N.'s; FA1001 SAE Ports	D60DD-20-79	3771421260	6.00	4.00	79.00

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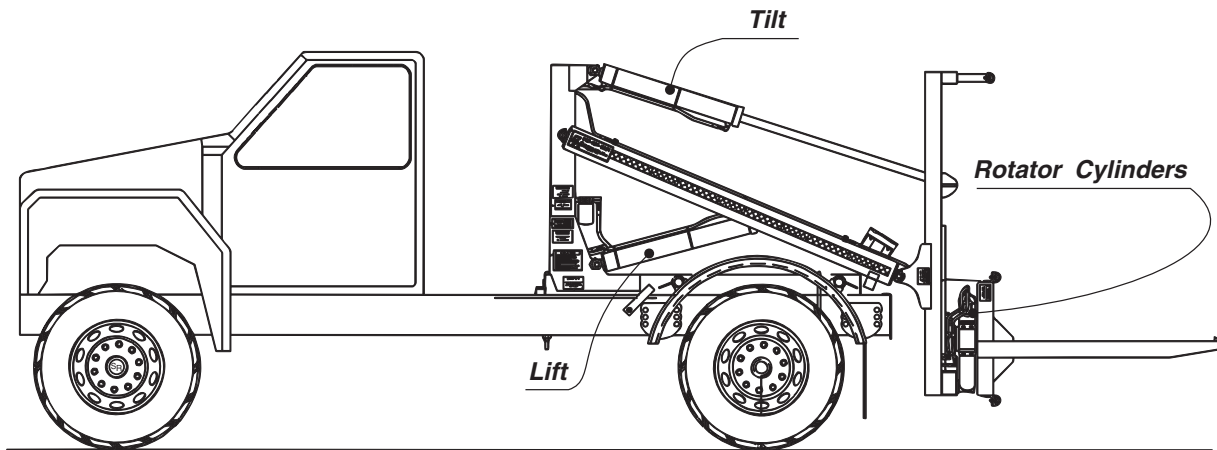
G & H Manufacturing R-90 Recycling Rear Loader



<u>Cylinder Function</u>	<u>Parker Eng#</u>	<u>Parker Number</u>	<u>Bore</u>	<u>Rod</u>	<u>Stroke</u>
Blade Packer / Carriage OEM Ref P.N.'s; A2610, H1234, PH-020-803	D50CD-4-30	3777921071	5.00	2.00	30.00
Blade / Sweep OEM Ref P.N.'s; A4456, H1238	D45DD-8-16.75	3774121038	4.50	2.50	16.75
Tailgate Raise OEM Ref P.N.'s; A4455, H1235	D40DD-22-15	3776821087	4.00	1.50	15.00
Tailgate Latch OEM Ref P.N.'s; A2823	D25AA-2-3.00	3772621143	2.50	1.25	3.00
Ejector Push Out, 25 Yd OEM Ref P.N.'s; H1232, 5530002	SD53CB-16-133	3771533093	Telescopic		133.50
Ejector Push Out, 30 Yd OEM Ref P.N.'s; H1233, 5530001	SD53CB-16-150	3771533094	Telescopic		150.00

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G & H Manufacturing 8000 & 8000R Container Carrier

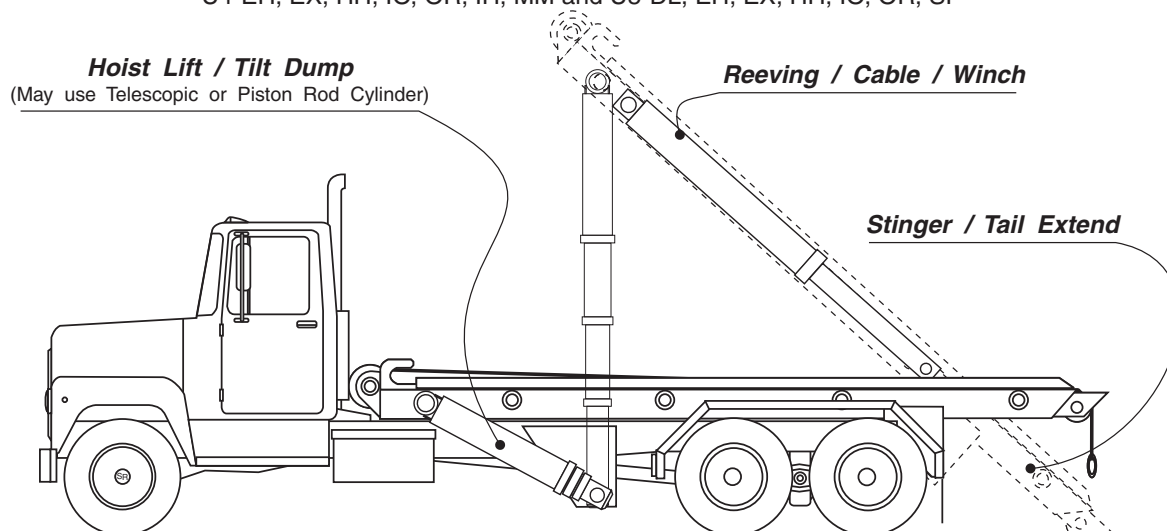


<u>Cylinder Function</u>	<u>Parker Eng#</u>	<u>Parker Number</u>	<u>Bore</u>	<u>Rod</u>	<u>Stroke</u>
Tilt OEM Ref H1020, PH-020-002	D40CD-16-29.50	3776821091	4.00	2.00	29.50
Tilt OEM Ref A1530	N/A		4.00	2.00	29.50
Lift OEM Ref H1018, PH-020-023	D40CD-15-31.88	3776821090	4.00	2.00	32.00
Lift OEM Ref A2116	N/A		4.00	2.00	32.00
Rotator OEM Ref A3689, H1019, PH-020-021	N/A		3.50		16.00

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Galbreath Roll-Off

U4-EH, EX, HH, IO, OR, IH, MM and U5-DL, EH, EX, HH, IO, OR, SI

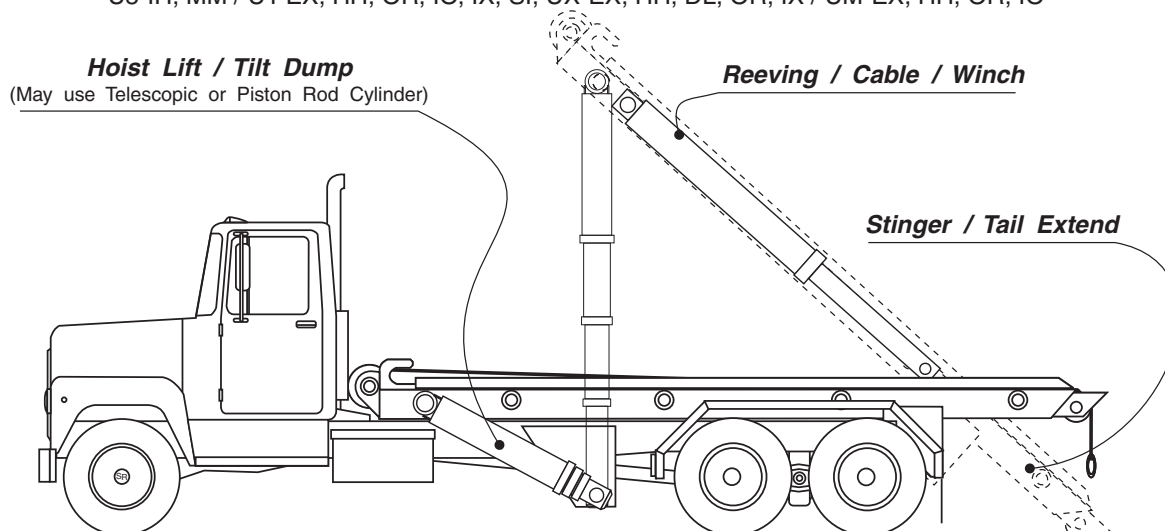


U4-EH-156 & -174 / U4-EX-156 & -175 / U4-HH-156 & -174 / U4-IO-156, -174 & -182 / U4-OR-156, -174 -182 / U4-IH / U4-MM						
<u>Cylinder Function</u>	<u>Parker Eng#</u>	<u>Parker Number</u>	<u>Bore</u>	<u>Rod</u>	<u>Stroke</u>	
Reeving / Cable / Winch; -156 OEM Ref P.N.'s; 2477, 8433, A1245, A2084, A3117	D60LN-2-75	3771421148	6.00	3.00	75.00	
Reeving / Cable / Winch; -174 & -182 OEM Ref P.N.'s; 1040, 2476, 4815, 9889, A2203, A3119	D60LN-2-80	3771421145	6.00	3.00	80.00	
Hoist Lift / Tilt Dump; -156 & -174 OEM Ref P.N.'s; 1039, 1043, 1126, 3412, 9920, A1527, A1793, A3137, B1043	D60DB-23-72	3771421262	6.00	4.50	72.00	
Hoist Lift / Tilt Dump; U4-MM OEM Ref P.N.'s; 2494, 3131, 3242, 3903, A2213 A3171, A3381	SD62CB-12-94	3771432078	Telescopic		94.00	
Stinger Tail Extend; -EX- & -EH- OEM Ref P.N.'s; 1031, 2464, 3074, 4636, A3091	D35BB-1-80	3774021012	3.50	2.50	80.00	
U5-DL-156, -174 & -194 / U5-EH-174 / U5-EX-156, -174 & -194 / U5-HH-156, -174 & -194 / U5-IO-156, -174, -182 & 194 / U5-OR-156, -174, -182 & 194 / U5-SI-186						
<u>Cylinder Function</u>	<u>Parker Eng#</u>	<u>Parker Number</u>	<u>Bore</u>	<u>Rod</u>	<u>Stroke</u>	
Reeving / Cable / Winch; -156 OEM Ref P.N.'s; 2452, 9924, A1896, A2452, A3145	D70LN-2-75	3773721021	7.00	3.00	75.00	
Reeving / Cable / Winch; -174, -182, -186 OEM Ref P.N.'s; 1054, 2460, 9921, A1529, A1717, A1897, A1968, A3147, B2460	D70LN-5-80	3773721139	7.00	3.00	80.00	
Reeving / Cable / Winch; -194 OEM Ref P.N.'s; 2455, 2463, 9846, A1898, A1969, A3149, B2455	D70LN-5-90	3773721140	7.00	3.00	90.00	
Hoist Lift / Tilt Dump; -156, -174, 182, 186 OEM Ref P.N.'s; 1039, 1043, 1126, 3412, 9920, A1527, A1793, A3137, B1043	D60DB-23-72	3771421262	6.00	4.50	72.00	
Hoist Lift / Tilt Dump; -194 OEM Ref P.N.'s; 2419, 3116, 3139, 3902, A2083, A3167, A3377	SD62CB-12-114	3771432079	Telescopic		114.00	
Stinger Tail Extend; -EX- & -EH- OEM Ref P.N.'s; 1031, 2464, 3074, 4636, A3091	D35BB-1-80	3774021012	3.50	2.50	80.00	
Stinger Tail Extend; -IX- OEM Ref P.N.'s; 1656, 3429, 4191, 4635, A3089	D35BB-1-60	3774021011	3.50	2.50	60.00	

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Galbreath Roll-Off

U5-IH, MM / UT-EX, HH, OR, IO, IX, SI, UX-EX, HH, DL, OR, IX / UM-EX, HH, OR, IO


U5-IH-156 & -174 / U5-MM-156 & -174 / UT-EX-174 & -194 / UT-HH-174 & -194 / UT-OR-174 & -194 / UT-IO-174, 182 & -194 / UT-IX-174, 182 & -194 / UT-SI-186 / UX-EX-169 / UX-HH-169 / UX-DL-169 / UX-OR-178 / UX-IO-178 / UM-EX-194 / UM-HH-194 / UM-OR-194 / UM-IO-194 / UX5

<u>Cylinder Function</u>	<u>Parker Eng#</u>	<u>Parker Number</u>	<u>Bore</u>	<u>Rod</u>	<u>Stroke</u>
Reeving / Cable / Winch; -156 OEM Ref P.N.'s; 2452, 9924, A1896, A2452, A3145	D70LN-2-75	3773721021	7.00	3.00	75.00
Reeving / Cable / Winch; -169, -174, -178, -182, -186 UM-HH-194 OEM Ref P.N.'s; 1054, 2460, 9921, A1529, A1717, A1897, A1968, A3147, B2460	D70LN-5-80	3773721139	7.00	3.00	80.00
Reeving / Cable / Winch; -194 OEM Ref P.N.'s; 2455, 2463, 9846, A1898, A1969, A3149, B2455	D70LN-5-90	3773721140	7.00	3.00	90.00

Hoist Lift / Tilt Dump; IH-174 OEM Ref P.N.'s; 1039, 1043, 1126, 3412, 9920, A1527, A1793, A3137, B1043	D60DB-23-72	3771421262	6.00	4.50	72.00
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Hoist Lift / Tilt Dump; UM-EX, UM-HH, UM-OR UM-IO OEM Ref P.N.'s; 2420, 8973, A2212, A3169, A3379	SD62CB-12-79	3771432077	Telescopic		79.00
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Hoist Lift / Tilt Dump; IH-156, MM, UX-EX, UX-HH UX-DL, UX-OR, UX-IO, UX-5 OEM Ref P.N.'s; 2494, 3131, 3242, 3903, A2213 A3171, A3381	SD62CB-12-94	3771432078	Telescopic		94.00
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Hoist Lift / Tilt Dump; UT-IO-194 OEM Ref P.N.'s; 2419, 3116, 3139, 3902, A2083, A3167, A3377	SD62CB-12-114	3771432079	Telescopic		114.00
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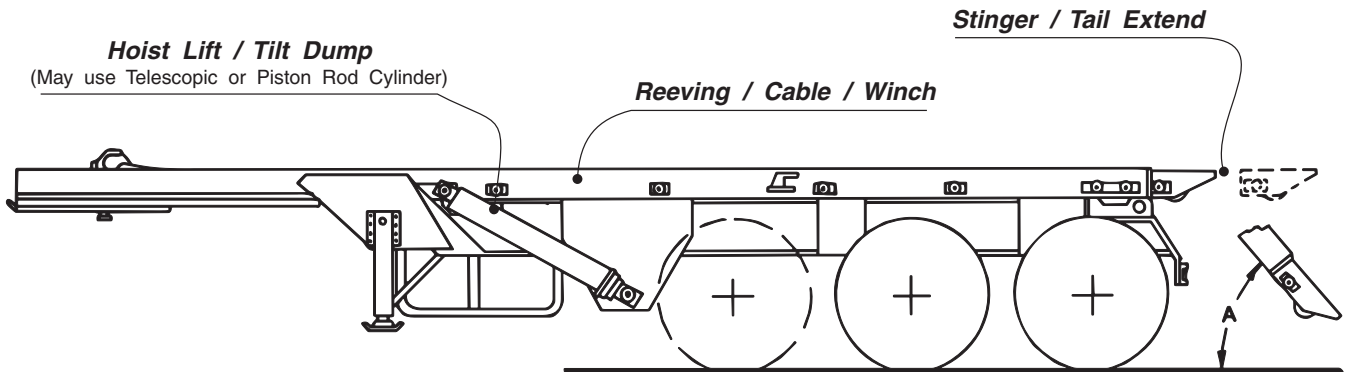
Hoist Lift / Tilt Dump; UT-EX-, UT-HH-, UT-OR-, UT-IO-174 & -182, -IX-, -SI- OEM Ref P.N.'s; 1111, A1606, A1745, A3173, A3383	SD63CB-23-118	3771433922	Telescopic		118.00
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Stinger Tail Extend; -EX-, -IX- OEM Ref P.N.'s; 1031, 2464, 3074, 4636, A3091	D35BB-1-80	3774021012	3.50	2.50	80.00
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Galbreath Roll-Off Trailer

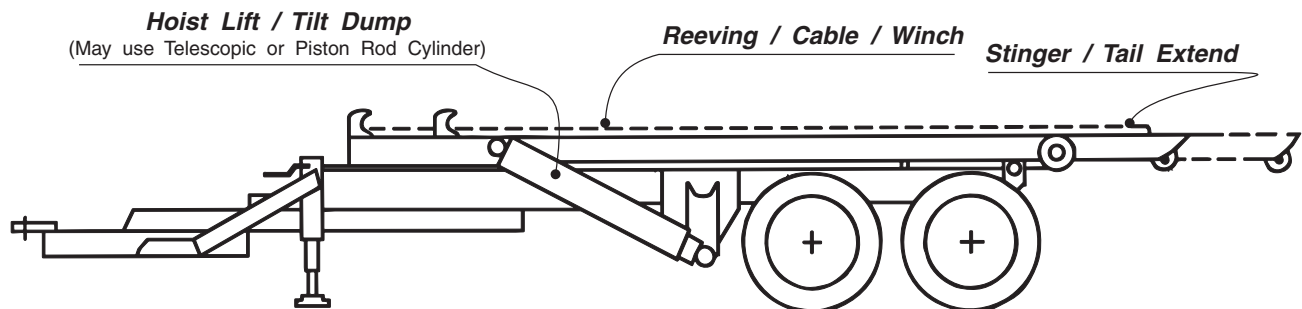
A5-EX-200 & -250, A5-OR-200 & -250, A5-IO-200 & -250, A5-HH-200 & -250, A5-DL-200 & -250



<u>Cylinder Function</u>	<u>Parker Eng#</u>	<u>Parker Number</u>	<u>Bore</u>	<u>Rod</u>	<u>Stroke</u>
Reeving / Cable / Winch; -200 OEM Ref P.N.'s; 2455, 2463, 9846, A1898, A1969, A3149, B2455	D70LN-5-90	3773721140	7.00	3.00	90.00
Reeving / Cable / Winch; -250 OEM Ref P.N.'s; 1124, 1163, , 2461, 3130, 9922 A1899, A3143, B2461	D70LN-2-108	3773721022	7.00	3.00	108.00
Hoist Lift / Tilt Dump; -200 OEM Ref P.N.'s; 2420, 8973, A2212, A3169, A3379	SD62CB-12-79	3771432077	Telescopic		79.00
Hoist Lift / Tilt Dump; -250 OEM Ref P.N.'s; 1111, A1606, A1745, A3173, A3383	SD63CB-23-118	3771433922	Telescopic		118.00
Stinger Tail Extend; -EX- OEM Ref P.N.'s; 1031, 2464, 3074, 4636, A3091	D35BB-1-80	3774021012	3.50	2.50	80.00

Galbreath TT Trailer

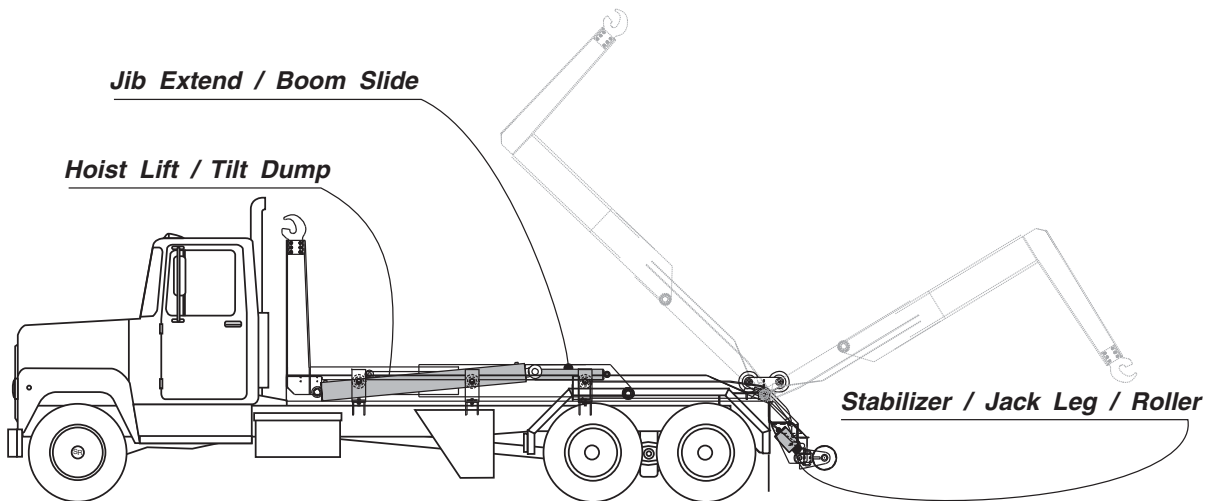
TT-OR-176, TT-EX-176, TT-IO-176, TT-HH-176, TT-DL-176



<u>Cylinder Function</u>	<u>Parker Eng#</u>	<u>Parker Number</u>	<u>Bore</u>	<u>Rod</u>	<u>Stroke</u>
Reeving / Cable / Winch; OEM Ref P.N.'s; 1040, 2476, 4815, 9889, A2203, A3119	D60LN-2-80	3771421145	6.00	3.00	80.00
Hoist Lift / Tilt Dump; OEM Ref P.N.'s; 1944, A2202, A3165	SD52CB-7-79	3771532059	Telescopic		79.00
Stinger Tail Extend; -EX- OEM Ref P.N.'s; 1031, 2464, 3074, 4636, A3091	D35BB-1-80	3774021012	3.50	2.50	80.00

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U13-HL, U20-HK, U30-HK, U5-HK, U6-HK



<u>Cylinder Function</u>	<u>Parker Eng#</u>	<u>Parker Number</u>	<u>Bore</u>	<u>Rod</u>	<u>Stroke</u>
Jib Extend; U13-HL, U20-HL OEM Ref P.N.'s; 9933, A1888, A3081	D30BB-1-37	3770521068	3.00	2.00	37.00
Jib Extend; U30-HL, U5-HL, U6-HL OEM Ref P.N.'s; 9780, A1889, A3101	D40BB-1-48	3770821034	4.00	2.50	48.00
Hoist Lift / Tilt Dump; U13-HL, U20-HL OEM Ref P.N.'s; 9932, A1890, A2077, A2152, A3109	D50BB-3-52	3777921016	5.00	3.00	52.00
Hoist Lift / Tilt Dump; U30-HL OEM Ref P.N.'s; A1213, A1453, A3123	D60DC-9-78	3771421163	6.00	3.50	78.00
Hoist Lift / Tilt Dump; U5-HL, U6-HL OEM Ref P.N.'s; 9566, A1528, A3151	D70DC-2-81	3772521104	7.00	3.50	81.00
Stabilizer / Jack Leg; U6-HK OEM Ref P.N.'s; 3091, 3106, 7392, 9500, 9872 A1891, A3115	D60BB-3-4.81	3771421139	6.00	3.00	4.81

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U2-EX, U2-OR, U3-EX, U3-IO, U3-OR, MB-EX and MB-OR

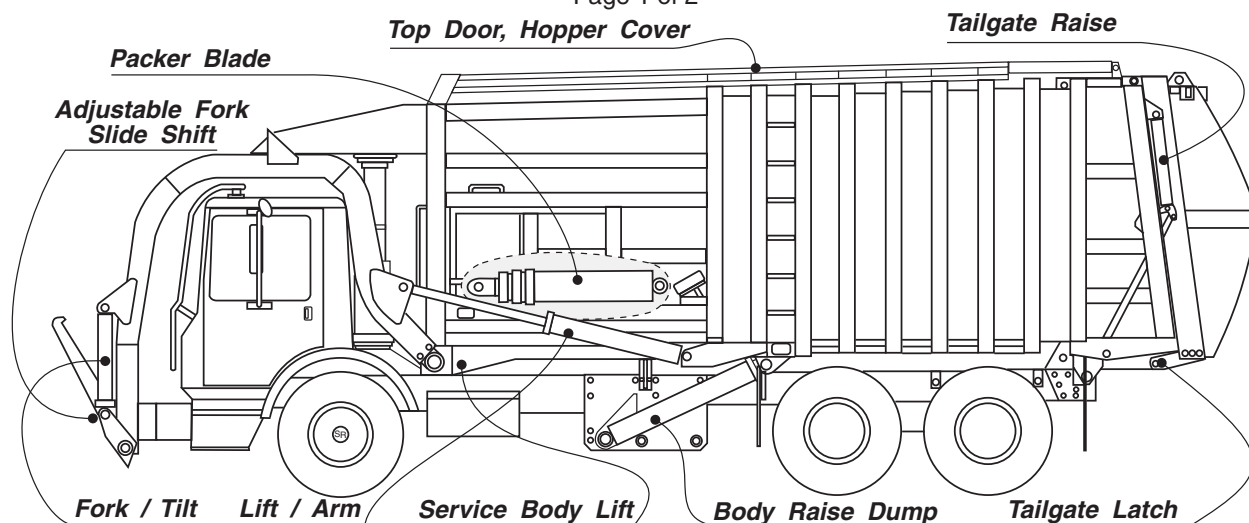
U2-EX, U2-OR, U3-EX, U3-IO, U3-OR, MB-EX and MB-OR



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Heil Half Pack III Front Loader

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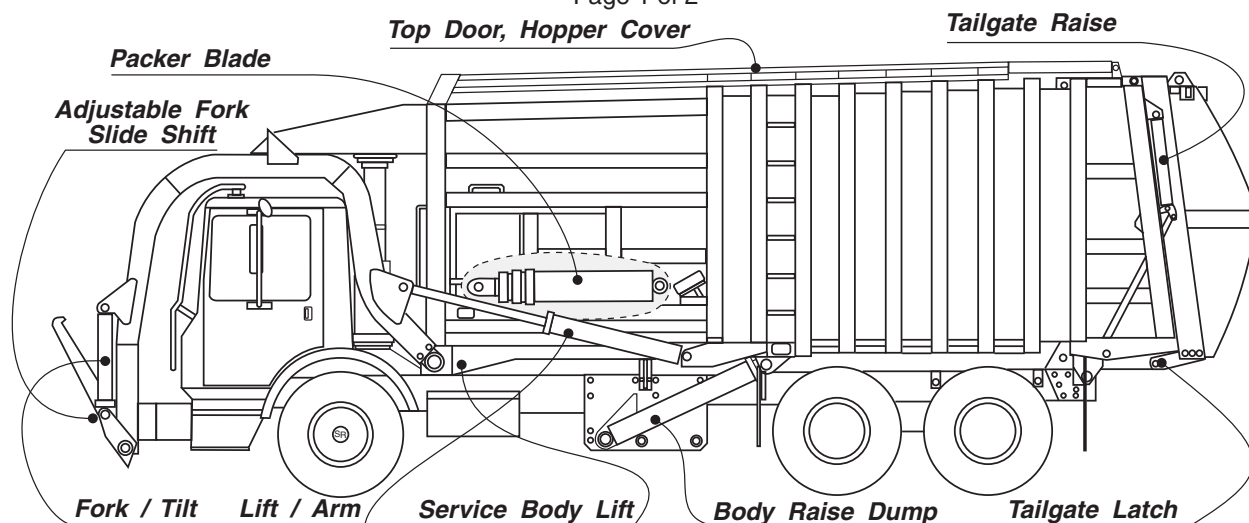


<u>Cylinder Function</u>	<u>Parker Eng#</u>	<u>Parker Number</u>	<u>Bore</u>	<u>Rod</u>	<u>Stroke</u>
Arm / Lift OEM Ref P.N.'s; 1-4871	D45CC-14-41.50	3774121035	4.50	2.50	41.50
Arm / Lift OEM Ref P.N.'s; 1-5098, 1-5150, 1-6370, 1-6388	D45CC-19-41.50	3774121041	4.50	2.50	41.50
Fork / Tilt OEM Ref P.N.'s; 1-4868, 1-6369, 1-6669, 1-6777	D40CD-14-25	3776821084	4.00	2.00	25.00
Fork / Tilt With 3" Stop OEM Ref P.N.'s; 1-4903, 1-6384, 1-6670	D40CD-8-22	3776821067	4.00	2.00	22.00
Fork / Tilt With 6" Stop OEM Ref P.N.'s; 1-6126, 1-6385, 1-6671	D40CC-27-19	3776821094	4.00	2.00	19.00
Adjustable Fork / Slide Shift OEM Ref P.N.'s; 1-4876	N/A	N/A	1.50	1.00	
Top Door 28 Yd Body OEM Ref P.N.'s; 1-3717, 1-6386	D25LD-2-90	3772621121	2.50	1.50	90.00
Top Door 23 Yd Body OEM Ref P.N.'s; 1-3719, 1-6387	N/A	N/A	2.50	1.50	68.00
Tailgate Raise, Shur-Lock OEM Ref P.N.'s; 1-5088, 1-6521, 1-6721	D30CC-17-28.19	3770521108	3.00	1.75	28.18
Tailgate Raise OEM Ref P.N.'s; 1-4870	D30CL-2-25.25	3770521093	3.00	1.50	25.25
Tailgate Latch OEM Ref P.N.'s; 1-3727, 1-6153, 1-6522, 1-6720	D30CA-2-3.62	3770521101	3.00	1.50	3.63

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Heil Half Pack III Front Loader

Page 1 of 2

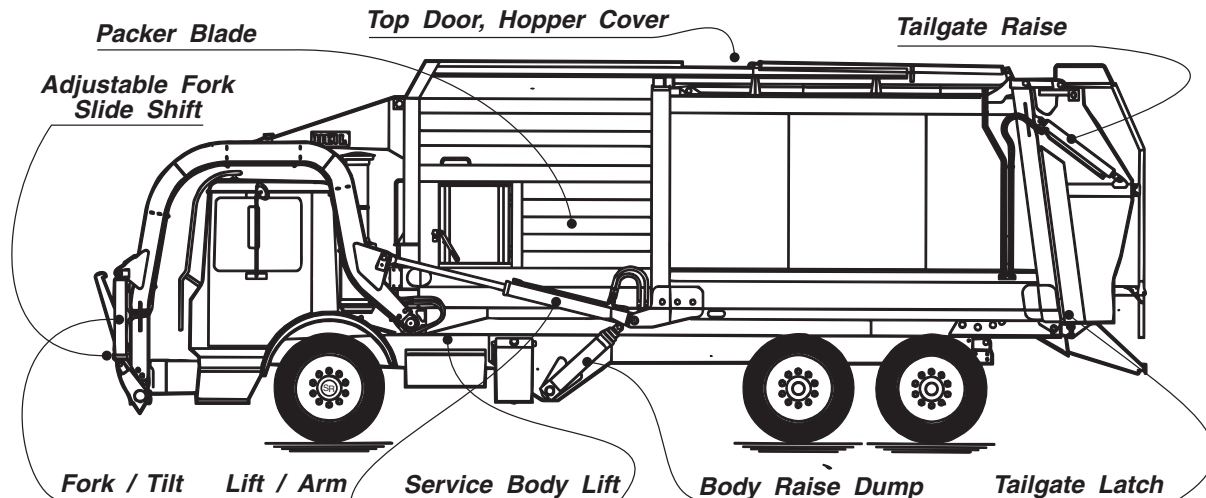


<u>Cylinder Function</u>	<u>Parker Eng#</u>	<u>Parker Number</u>	<u>Bore</u>	<u>Rod</u>	<u>Stroke</u>
Packer Blade, IIIE OEM Ref P.N.'s; 1-4906, 1-5112, 1-6075, 1-6100, 1-6250, 1-6257	SD53CD-4-169	3771933018	Telescopic		169.75
Packer Blade, IIIE 28 Yd OEM Ref P.N.'s; 1-4881, 1-4911, 1-6096, 1-6099, 1-6255, 1-6256	SD53CD-4-182	3771933016	Telescopic		182.00
Packer Blade, IIIE 23 Yd OEM Ref P.N.'s; 1-5070, 1-5149, 1-6078, 1-6252, 1-6316, 1-6598	SD53CC-51-151.5	3771933036	Telescopic		151.50
Packer Blade, IIIE 28 Yd OEM Ref P.N.'s; 1-5147, 1-6076, 1-6247, 1-6318 1-6597	SD53CC-51-182	3771933032	Telescopic		182.00
Service Body Lift OEM Ref P.N.'s; 1-3735	N/A	N/A			
Packer Blade, IIID Gravity Dump OEM Ref P.N.'s; 1-5146, 1-6230, 1-6525	D55CC-6-63	3771921033	5.50	4.00	63.00
Packer Blade, IIID Gravity Dump OEM Ref P.N.'s; 1-4882	D55DB-2-63	3771921035	5.50	4.00	63.00
Body Raise Dump OEM Ref P.N.'s; 1-4869	D50DC-3-45	3777921070	5.00	3.50	45.00
Body Raise Dump, Pusher Axle III OEM Ref P.N.'s; 1-4854	S63DC-80-74.18	3771413261	Telescopic		74.19
Body Raise Dump OEM Ref P.N.'s; 1-4891, 1-6121	S52DB-9-67.50	3771512080	Telescopic		67.50
Body Raise Dump OEM Ref P.N.'s; 1-6140	N/A	N/A	Telescopic		

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Heil Dura-Pack Half/Pack Front Loader

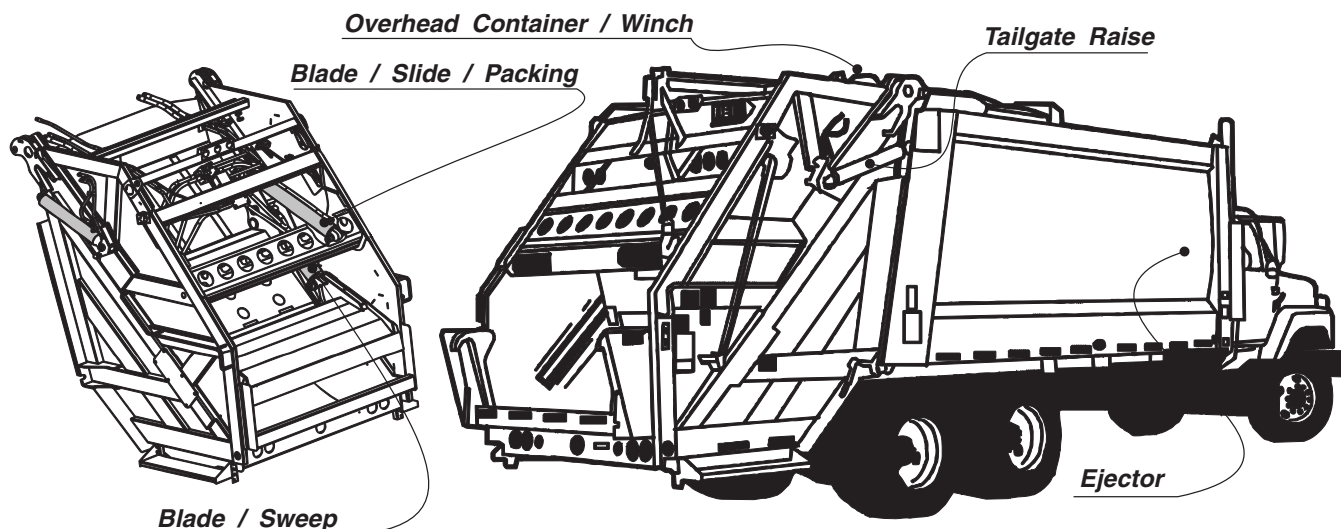
Serial Numbers HPD4501000, HPE4601000 & HPS4701000 and AFTER



<u>Cylinder Function</u>	<u>Parker Eng#</u>	<u>Parker Number</u>	<u>Bore</u>	<u>Rod</u>	<u>Stroke</u>
Arm / Lift OEM Ref P.N.'s; 1-5098, 1-5150, 1-6370, 1-6388	D45CC-19-41.50	3774121041	4.50	2.50	41.50
Fork / Tilt OEM Ref P.N.'s; 1-4868, 1-6369, 1-6669, 1-6777	D40CD-14-25	3776821084	4.00	2.00	25.00
Fork / Tilt With 3" Stop OEM Ref P.N.'s; 1-4903, 1-6384, 1-6670	D40CD-8-22	3776821067	4.00	2.00	22.00
Fork / Tilt With 6" Stop OEM Ref P.N.'s; 1-6126, 1-6385, 1-6671	D40CC-27-19	3776821094	4.00	2.00	19.00
Adjustable Fork / Slide Shift OEM Ref P.N.'s; 1-3798	D15CD-6-21	3776921021	1.50	1.00	21.00
Adjustable Fork / Slide Shift OEM Ref P.N.'s; 1-4876	N/A	N/A	1.50	1.00	13.12
Top Door 28 Yd Body OEM Ref P.N.'s; 1-3717, 1-6386	D25LD-2-90	3772621121	2.50	1.50	90.00
Top Door 23 Yd Body OEM Ref P.N.'s; 1-3719, 1-6387	N/A	N/A	2.50	1.50	68.00
Tailgate Raise OEM Ref P.N.'s; 1-5088, 1-6521, 1-6721	D30CC-17-28.19	3770521108	3.00	1.75	28.18
Tailgate Latch OEM Ref P.N.'s; 1-3727, 1-6153, 1-6522, 1-6720	D30CA-2-3.62	3770521101	3.00	1.50	3.63
Packer Blade, HPD45 Gravity Dump OEM Ref P.N.'s; 1-5146, 1-6230, 1-6525	D55CC-6-63	3771921033	5.50	4.00	63.00
Packer Blade, HPE46 & HPS47 23 Yd OEM Ref P.N.'s; 1-5070, 1-5149, 1-6078, 1-6252, 1-6316, 1-6598	SD53CC-51-151.5	3771933036	Telescopic		151.00
Packer Blade, HPE46 & HPS47 28 Yd OEM Ref P.N.'s; 1-5147, 1-6076, 1-6247, 1-6318, 1-6597	SD53CC-51-182	3771933032	Telescopic		182.00
Service Body Lift, HPS47 OEM Ref P.N.'s; 1-3735	N/A	N/A			
Body Raise Dump, HPD45 Gravity Dump OEM Ref P.N.'s; 1-4891, 1-6121	S52DB-9-67.50	3771512080	Telescopic		67.50
Body Raise Dump, HPD45 Gravity Dump OEM Ref P.N.'s; 1-6425	S52CC-41-67.25	3771512091	Telescopic		67.25

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Heil Big Bite Rear Loader



<u>Cylinder Function</u>	<u>Parker Eng#</u>	<u>Parker Number</u>	<u>Bore</u>	<u>Rod</u>	<u>Stroke</u>
Blade / Slide / Packing OEM Ref P.N.'s; 1-6456	D55CC-9-35.88	3771921041	5.50	4.00	35.88
Blade / Sweep OEM Ref P.N.'s; 1-6457	D55CC-7-24	3771921039	5.50	3.50	24.00
Tailgate Raise OEM Ref P.N.'s; 1-6570	D50LC-2-24.50	3777921068	5.00	3.50	24.50
Tailgate Raise OEM Ref P.N.'s; 1-4880	S35CC-3-24.38	3776815002	4.00	3.50	24.38
Overhead Container Winch Reeving OEM Ref P.N.'s; 1-6061	D55CB-6-52.88	3771921038	5.50	4.00	52.88
Container Dump, Roll Bar OEM Ref P.N.'s; 1-4105	D25CC-10-14.12	3772621119	2.50	1.50	14.12
Container Dump; Arm Type OEM Ref P.N.'s; 1-2105, 1-3513, 1-4283,	D30CL-3-18.44	3770521099	3.00	1.50	18.44
Ejector Push Out, 18 Yd OEM Ref P.N.'s; 1-6429	N/A		Telescopic		
Ejector Push Out, 20 Yd OEM Ref P.N.'s; 1-6428	N/A		Telescopic		
Ejector Push Out, 25 Yd OEM Ref P.N.'s; 1-6427	SD64DC-7-133.12	3771434058	Telescopic		133.12
Ejector Push Out, 27 Yd OEM Ref P.N.'s; 1-6426	N/A		Telescopic		147.80
Ejector Push Out, 32 Yd OEM Ref P.N.'s; 1-6421	N/A		Telescopic		173.00

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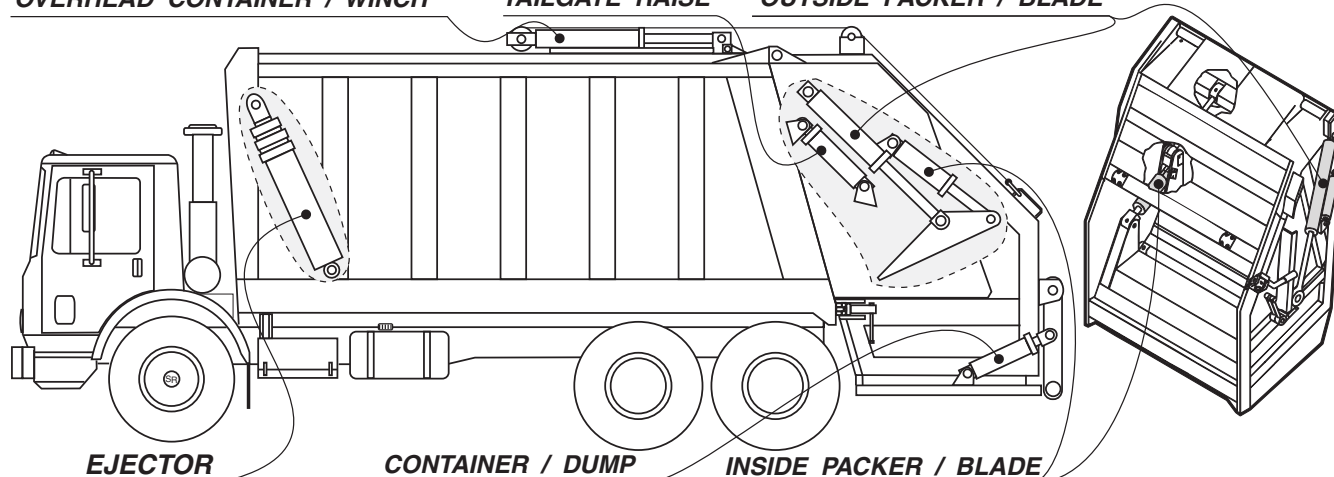
Heil Formula 5000 Rear Loader

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OVERHEAD CONTAINER / WINCH

TAILGATE RAISE

OUTSIDE PACKER / BLADE

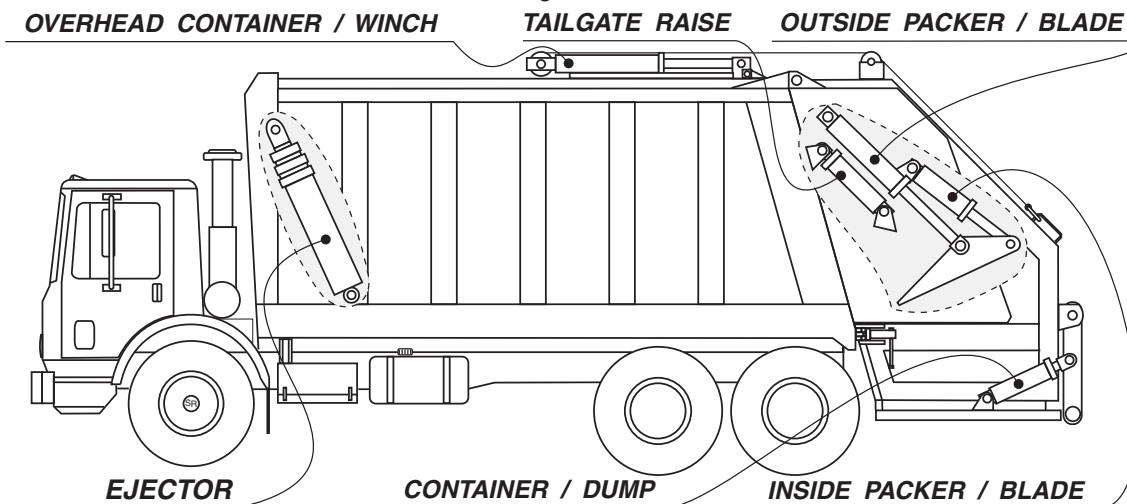


<u>Cylinder Function</u>	<u>Parker Eng#</u>	<u>Parker Number</u>	<u>Bore</u>	<u>Rod</u>	<u>Stroke</u>
Outside Packer / Blade; New Style OEM Ref P.N.'s; 1-4824, 1-4828, 1-4884, 1-5110, 1-6610	D50CC-27-36	3777921093	5.00	2.50	36.00
Outside Packer / Blade; Old Style OEM Ref P.N.'s; 1-4093	D50CC-23-36	3777921065	5.00	2.50	36.00
Inside Packer / Blade Sweep; New Style OEM Ref P.N.'s; 1-4347, 1-4887, 1-5111, 1-6611	D55CC-10-24.25	3771921043	5.50	3.50	24.25
Inside Packer / Blade Sweep; Old Style OEM Ref P.N.'s; 1-4094	D50CC-22-20	3777921064	5.00	3.00	20.00
Tailgate Raise; S/N 2740 & AFTER OEM Ref P.N.'s; 1-4348	S35CC-2-24.75	3776815001	4.00	3.50	24.75
Tailgate Raise; FP5014001-AFTER OEM Ref P.N.'s; 1-4880	S35CC-3-24.38	3776815002	4.00	3.50	24.38
Tailgate Raise; Old Style OEM Ref P.N.'s; 1-4272	C3876	3790003876	4.00	3.50	27.00
Container Dump, Arm Type OEM Ref P.N.'s; 1-4283	D30CL-3-18.44	3770521099	3.00	1.50	18.44
Container Dump, Roll Bar OEM Ref P.N.'s; 1-4105	D25CC-10-14.12	3772621119	2.50	1.50	14.12
Container Dump, Roll Bar Flipper OEM Ref P.N.'s; 1-4264	N/A	N/A			
Overhead Container Reeving OEM Ref P.N.'s; 1-4309	D55CB-5-49.88	3771921034	5.50	4.00	49.88
Overhead Container Reeving, S/N 8725-After OEM Ref P.N.'s; 1-6189	N/A	N/A			
Overhead Container Reeving, S/N FP5014001-AFTER OEM Ref P.N.'s; 1-6061	D55CB-6-52.88	3771921038	5.50	4.00	52.75

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Heil Formula 5000 Rear Loader

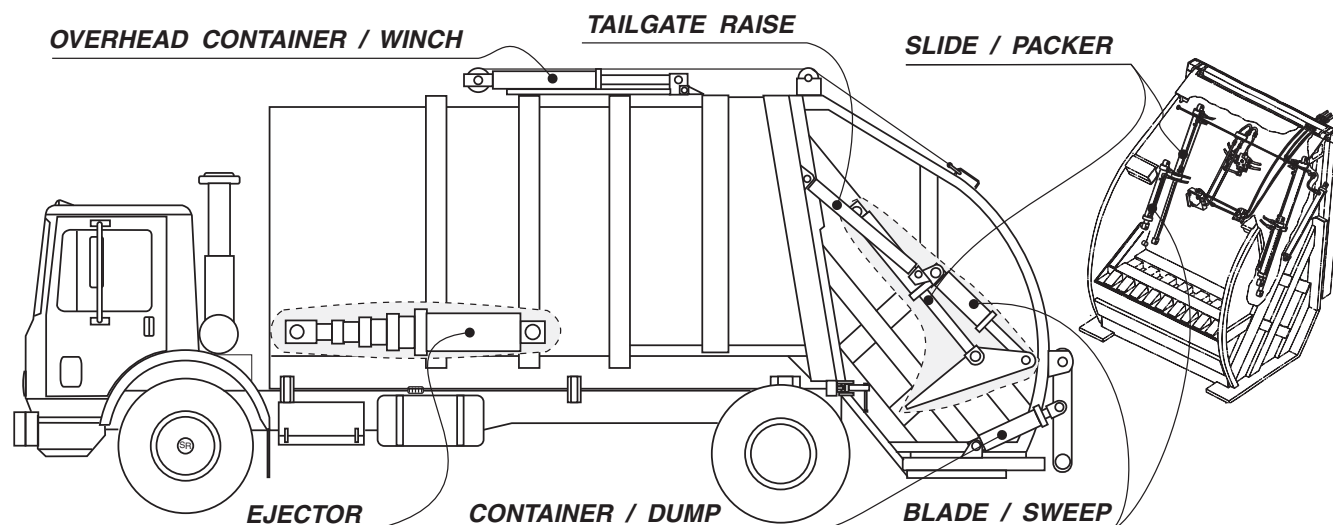
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<u>Cylinder Function</u>	<u>Parker Eng#</u>	<u>Parker Number</u>	<u>Bore</u>	<u>Rod</u>	<u>Stroke</u>
Ejector / Push Out, 18 YD S/N 2912-UP OEM Ref P.N.'s; 1-4267	SD63DB-6-93	3771433073	Telescopic		93.00
Ejector / Push Out, 20 YD S/N 2912-UP OEM Ref P.N.'s; 1-4266	SD63DB-17-108	3771433929	Telescopic		108.00
Ejector / Push Out, 25 YD S/N 2912-UP OEM Ref P.N.'s; 1-4261	SD63DB-7-132	3771433046	Telescopic		132.00
Ejector / Push Out, 32 YD S/N 2912-UP OEM Ref P.N.'s; 1-4270, 1-4343, 1-4821	SD74DB-4-171	3772534031	Telescopic		171.00
Ejector / Push Out, 18 YD S/N FP5014001-AFTER OEM Ref P.N.'s; 1-6429	N/A	N/A	Telescopic		
Ejector / Push Out, 18 YD S/N FP5014001-AFTER OEM Ref P.N.'s; 1-6463	N/A	N/A	Telescopic		
Ejector / Push Out, 20 YD S/N FP5014001-AFTER OEM Ref P.N.'s; 1-6428	N/A	N/A	Telescopic		
Ejector / Push Out, 20 YD S/N FP5014001-AFTER OEM Ref P.N.'s; 1-6464	N/A	N/A	Telescopic		
Ejector / Push Out, 25 YD S/N FP5014001-AFTER OEM Ref P.N.'s; 1-6427	SD64DC-7-133.12	3771434058	Telescopic		133.12
Ejector / Push Out, 27 YD S/N FP5014001-AFTER OEM Ref P.N.'s; 1-6426	N/A	N/A	Telescopic		147.80
Ejector / Push Out, 32 YD S/N FP5014001-AFTER OEM Ref P.N.'s; 1-6421	N/A	N/A	Telescopic		173.60

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Heil Formula 4000 / MKIV Rear Loader

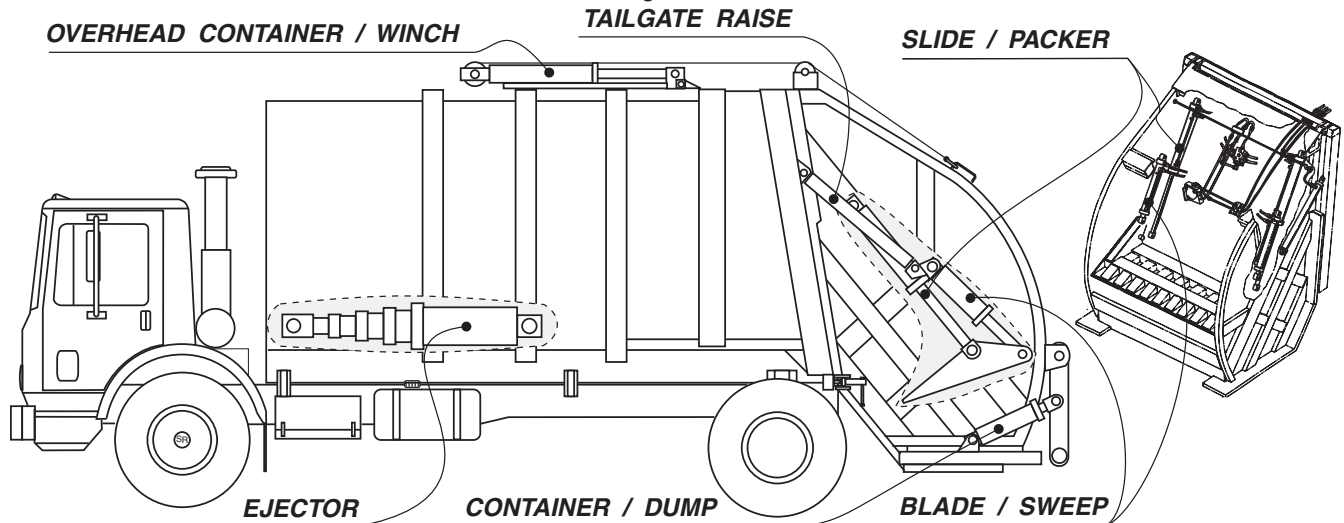


<u>Cylinder Function</u>	<u>Parker Eng#</u>	<u>Parker Number</u>	<u>Bore</u>	<u>Rod</u>	<u>Stroke</u>
Blade / Sweep, Cushioned OEM Ref P.N.'s; 1-4108, 1-4334	C3847	3790003847	4.00	2.50	21.63
Blade / Sweep, Non-Cushioned Old Style OEM Ref P.N.'s; 1-2931, 1-3672, 1-3856, 1-3902, 1-4017, 1-4100	D35CC-17-21.62	3773821056	3.50	2.25	21.63
Slide / Packer, Cushioned OEM Ref P.N.'s; 1-4081, 1-4110	C3850	3790003850	4.50	2.00	26.50
Slide / Packer, Non-Cushioned Old Style OEM Ref P.N.'s; 1-2928, 1-3635, 1-3809, 1-3921, 1-4018, 1-4101	D45CC-11-26.94	3774121027	4.50	2.00	26.94
Tailgate Raise OEM Ref P.N.'s; 1-3008, 1-3623, 1-4070	B5347	3790005347	3.00	2.50	31.25
Tailgate Raise, Light Weight OEM Ref P.N.'s; 1-4336	N/A	N/A	3.00	2.50	31.25
Container Dump, Arm Type OEM Ref P.N.'s; 1-2105, 1-3513, 1-4283	D30CL-3-18.44	3770521099	3.00	1.50	18.44
Container Dump, Roll Bar OEM Ref P.N.'s; 1-4105	D25CC-10-14.12	3772621119	2.50	1.50	14.12
Container Dump, Roll Bar Flipper OEM Ref P.N.'s; 1-5069	N/A	N/A			
Overhead Container Reeving OEM Ref P.N.'s; 1-4309	D55CB-5-49.88	3771921034	5.50	4.00	49.88
Overhead Container Reeving, S/N 4F-1014878 OEM Ref P.N.'s; 1-6189	N/A	N/A			

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Heil Formula 4000 / MKIV Rear Loader

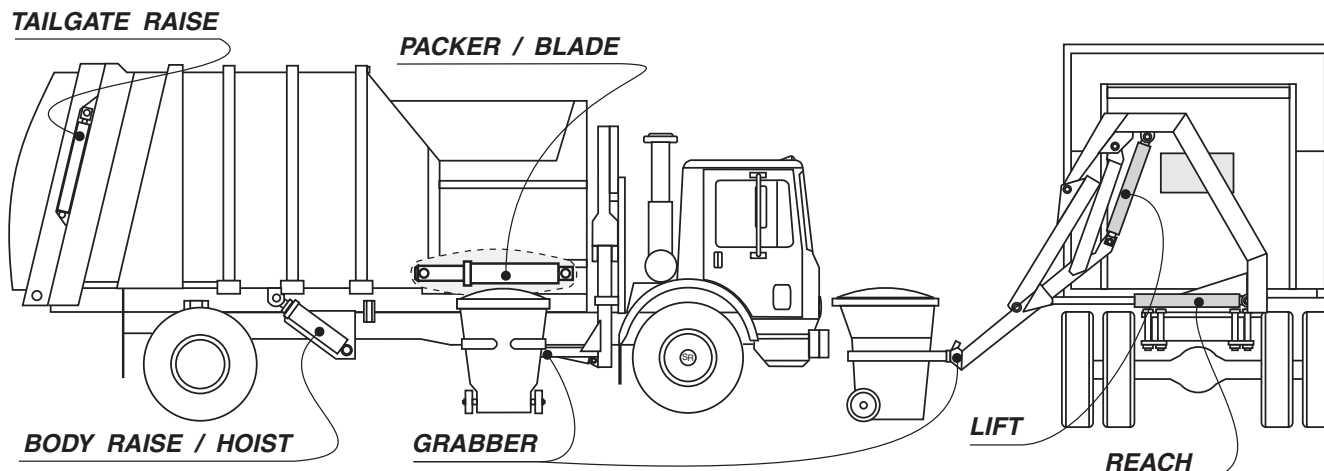
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<u>Cylinder Function</u>	<u>Parker Eng#</u>	<u>Parker Number</u>	<u>Bore</u>	<u>Rod</u>	<u>Stroke</u>
Ejector / Pushout, 13 YD OEM Ref P.N.'s; 1-1348, 1-3835, 1-4051	N/A		Telescopic		89.38
Ejector / Pushout, 16 YD OEM Ref P.N.'s; 1-1281, 1-3834, 1-4052	SD53CC-25-106	3771533051	Telescopic		106.00
Ejector / Pushout, 18 YD OEM Ref P.N.'s; 1-3391, 1-3836, 1-4053	SD64CC-7-118	3771434037	Telescopic		118.00
Ejector / Pushout, 20YD OEM Ref P.N.'s; 1-1344, 1-3830, 1-3871, 1-4050	SD64CC-7-132	3771434035	Telescopic		132.00
Ejector / Pushout, 25YD OEM Ref P.N.'s; 1-2123, 1-3843, 1-4054	SD64CC-7-152	3771434036	Telescopic		152.00
Ejector / Pushout, 13YD Snout Less OEM Ref P.N.'s; 1-3741, 1-6222	N/A		Telescopic		64.75
Ejector / Pushout, 16YD Snout Less OEM Ref P.N.'s; 1-3742, 1-6223	N/A		Telescopic		81.63
Ejector / Pushout, 18YD Snout Less OEM Ref P.N.'s; 1-6224	N/A		Telescopic		96.12
Ejector / Pushout, 20YD Snout Less OEM Ref P.N.'s; 1-6225	SD64DC-6-110.34	3771434056	Telescopic		110.34
Ejector / Pushout, 25YD Snout Less OEM Ref P.N.'s; 1-6226	N/A		Telescopic		129.00

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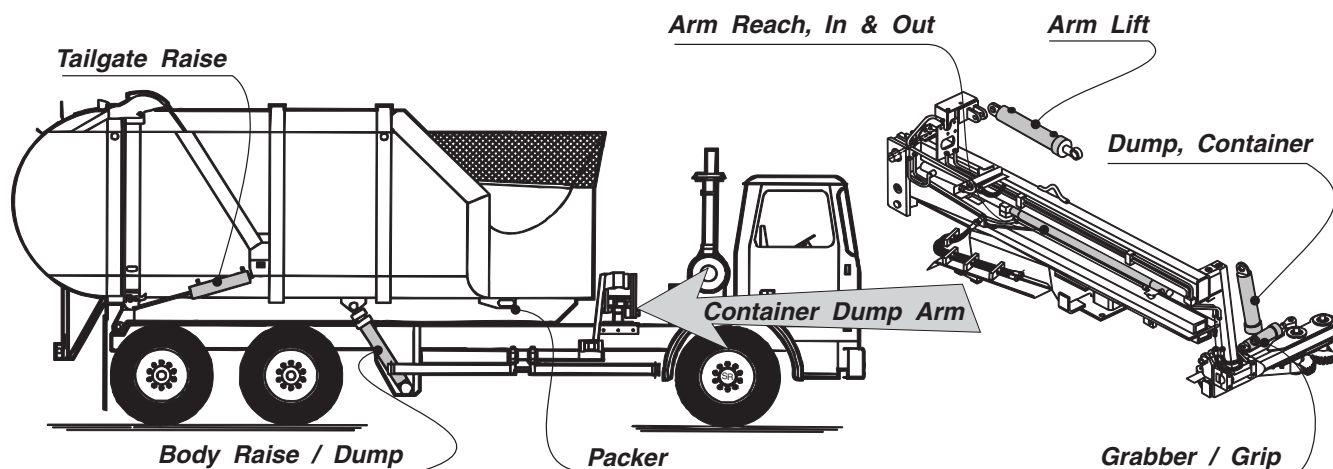
Heil Formula 7000 Automated Side Loader



<u>Cylinder Function</u>	<u>Parker Eng#</u>	<u>Parker Number</u>	<u>Bore</u>	<u>Rod</u>	<u>Stroke</u>
Arm Lift OEM Ref P.N.'s; 1-4275, 1-4338, 1-6582	C3576	3790003576	3.00	1.50	27.62
Arm Reach OEM Ref P.N.'s; 1-4276	C3602	3790003602	3.00	1.50	30.50
Arm Reach OEM Ref P.N.'s; 1-6094	D30CC-16-30.50	3770521106	3.00	1.50	30.50
Arm Reach OEM Ref P.N.'s; 1-6364	N/A		3.00	1.50	30.50
Grabber OEM Ref P.N.'s; 1-4277, 1-4327	C3603	3790003603	3.00	1.50	11.00
Grabber; Rapid Rail Arm OEM Ref P.N.'s; 1-6169, 1-6330, 1-6331, 1-6402, 1-6416	D30CC-18-8.00	3770521110	3.00	1.12	8.00
Grabber OEM Ref P.N.'s; 1-4297	C3875	3790003875	3.00	1.50	11.00
Tailgate Raise OEM Ref P.N.'s; 1-4123, 1-4305	C4438	3790004438	3.00	1.50	25.25
Tailgate Raise OEM Ref P.N.'s; 1-5088, 1-6521, 1-6721	D30CC-17-28.19	3770521108	3.00	1.50	28.19
Tailgate Latch OEM Ref P.N.'s; 1-3727, 1-6153, 1-6522, 1-6720	D30CA-2-3.62	3770521101	3.00	1.50	3.63
Packer / Full Eject, 27 Yd OEM Ref P.N.'s; 1-5070, 1-5149, 1-6078, 1-6252, 1-6316, 1-6598	SD53CC-51-151.5	3771933036	Telescopic		151.50
Packer / Full Eject, 31 Yd OEM Ref P.N.'s; 1-5147, 1-6067, 1-6076, 1-6247, 1-6318, 1-6597	SD53CC-51-182	3771933032	Telescopic		182.00
Packer / Full Eject, 27 Yd OEM Ref P.N.'s; 1-5148, 1-6077, 1-6251	N/A		Telescopic		138.00
Packer / Dump Unit OEM Ref P.N.'s; 1-4298, 1-4299, 1-4878	C3563	3790003563	5.50	4.00	54.13
Packer / Dump Unit, Rapid Rail Durapack OEM Ref P.N.'s; 1-4915, 1-6560	D50CC-24-34.19	3777921069	5.50	3.50	34.19
Body Raise / Dump OEM Ref P.N.'s; 1-2039, 1-4807, 1-6157, 1-6191	S52CC-41-54.62	3771512092	Telescopic		56.07

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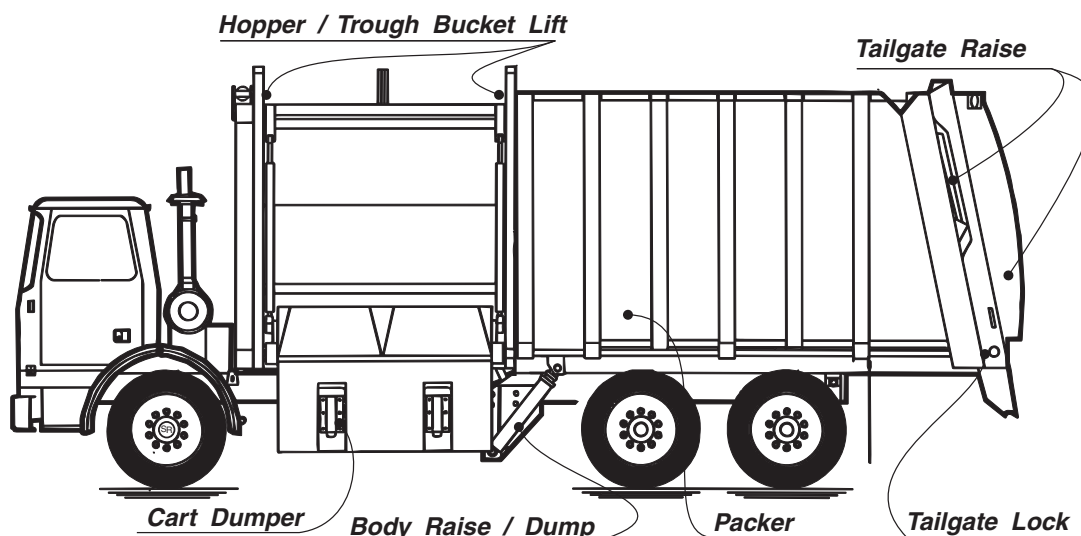
Heil / Rapid Rail Automated Side Loader



<u>Cylinder Function</u>	<u>Parker Eng#</u>	<u>Parker Number</u>	<u>Bore</u>	<u>Rod</u>	<u>Stroke</u>
Grabber / Grip OEM Ref P.N.; 1-6169, 1-6330, 1-6331, 1-6402, 1-6416	D30CC-18-8.00	3770521110	2.00	1.12	8.00
Arm Reach / In & Out OEM Ref P.N.; 1-6162, 1-6194, 1-6399, 1-6403	D17AE-2-71.88	3778121003	1.75	1.12	71.88
Arm Lift OEM Ref P.N.; 1-6161, 1-6404	D30CC-19-16.00	3770521111	3.00	2.00	16.06
Dump, Container OEM Ref P.N.; 1-6160, 1-6407	D30CC-20-8.00	3770521113	3.00	1.12	8.00
Packer OEM Ref P.N.'s; 1-6164, 1-6406, 1-6581	D50CC-25-43	3777921075	5.00	1.50	43.00
Tailgate Raise OEM Ref P.N.'s; 1-6163, 1-6405, 1-6554	D30CE-11-18.50	3770521112	3.00	1.12	18.50
Body Raise / Dump OEM Ref P.N.'s; 1-6191, 1-6445	S52CC-41-54.62	3771512092	Telescopic		55.38

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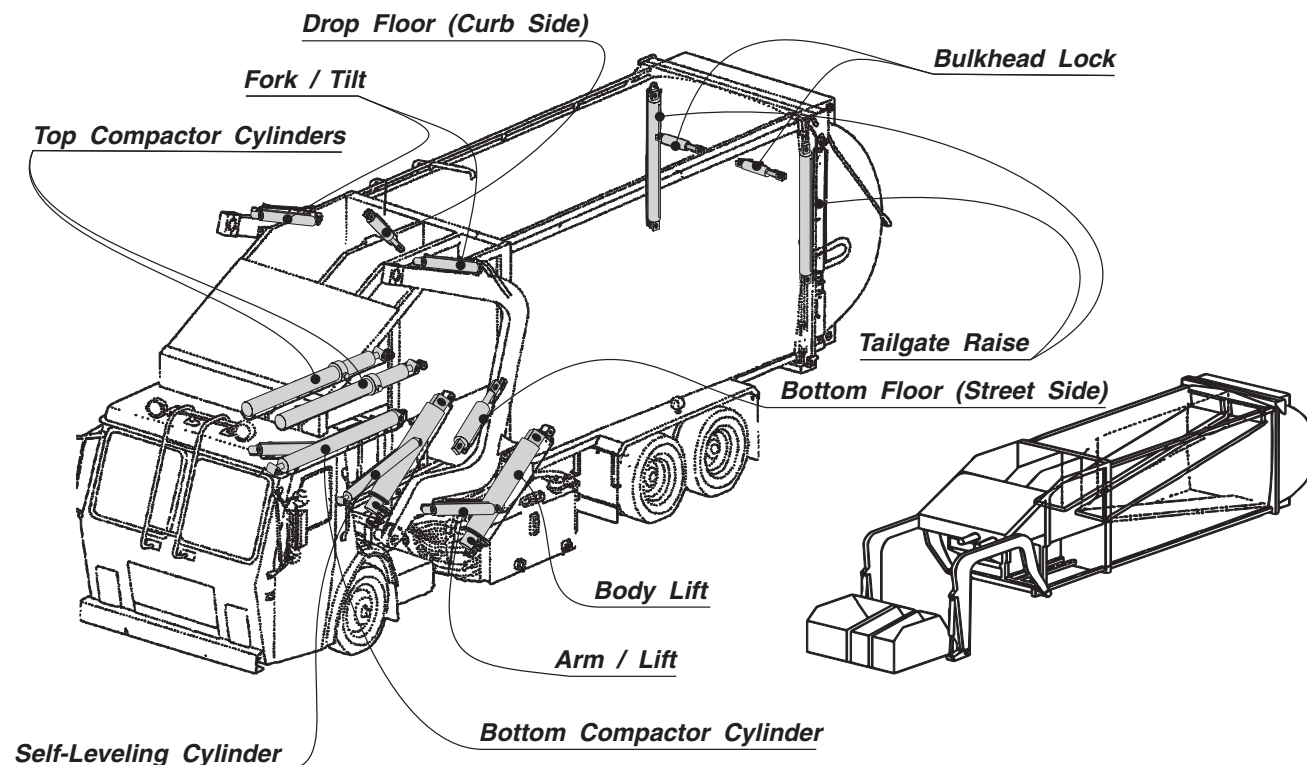
Heil Recycle 2000 Recycling Body



<u>Cylinder Function</u>	<u>Parker Eng#</u>	<u>Parker Number</u>	<u>Bore</u>	<u>Rod</u>	<u>Stroke</u>
Hopper / Trough Bucket Lift OEM Ref P.N.'s; 1-6070, 1-6142	D30CC-13-21.62	3770521098	3.00	1.580	21.62
Packer OEM Ref P.N.'s; 1-6069	D40CD-13-37	3776821078	4.00	2.50	37.00
Tailgate Raise, Upper OEM Ref P.N.'s; 1-2105, 1-3513, 1-4283	D30CL-3-18.44	3770521099	3.00	1.50	18.44
Tailgate Raise, Lower OEM Ref P.N.'s; 1-3778	D30CL-4-23.25	3770521100	3.00	1.50	23.19
Tailgate Latch OEM Ref P.N.'s; 1-3727, 1-6153, 1-6522, 1-6720	D30CA-2-3.62	3770521101	3.00	1.50	3.63
Body Raise / Dump, 33 YD OEM Ref P.N.'s; 1-2039, 1-4807, 1-6157, 1-6191	S52CC-41-54.62	3771512092	Telescopic		56.00
Body Raise / Dump, 38 YD OEM Ref P.N.'s; 1-6425	S52CC-41-67.25	3771512091	Telescopic		67.25
Body Raise / Dump, 38 YD OEM Ref P.N.'s; 1-6117	S63DC-79-67	3771413260	Telescopic		67.00
Cart Dumper OEM Ref P.N.'s	N/A				

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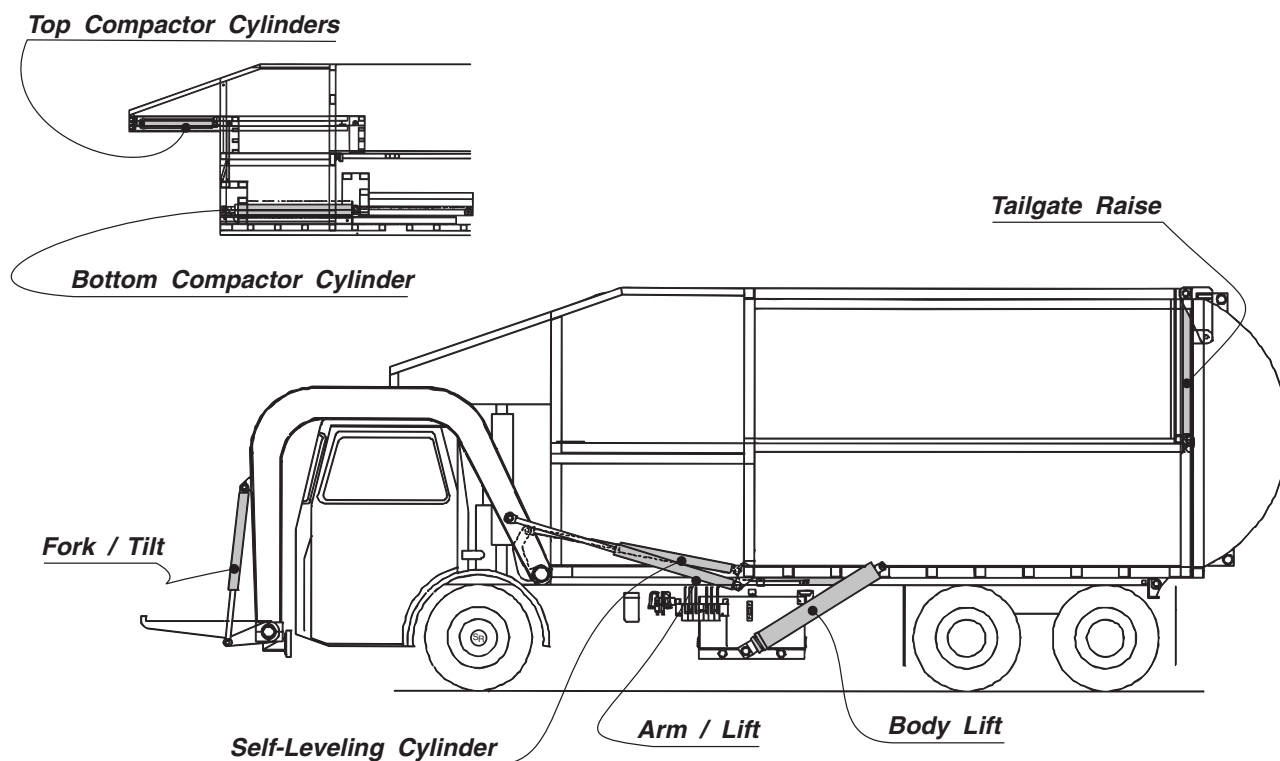
Kann Manufacturing CoCollector



<u>Cylinder Function</u>	<u>Parker Eng#</u>	<u>Parker Number</u>	<u>Bore</u>	<u>Rod</u>	<u>Stroke</u>
Arm / Lift (Non-Digitrak) OEM Ref P.N.; 1400135	D35CC-28-38	3773821086	3.50	2.00	38.00
Arm / Lift, (Digitrak) OEM Ref P.N.; 1400136	B5773	3790005773	3.50	2.00	38.00
Fork / Tilt OEM Ref P.N.; 1400101	D30CD-13-28	3770521128	3.00	1.75	28.00
Self-Leveling; Fork OEM Ref P.N.; 1400102, 3701054	B4775	3790004775	3.00	1.75	36.00
Top Compactor OEM Ref P.N.; 1400121	D40MD-1-72	3776821092	4.00	2.50	72.00
Bottom Compactor OEM Ref P.N.; 1400106	D65CC-9-66	3773921049	6.50	4.00	66.00
Tailgate Raise OEM Ref P.N.; 1400128	D30LD-10-36	3770521127	3.00	1.75	36.00
Drop Floor (Curb Side) OEM Ref P.N.; 1400119	D35LL-8-16	3790005424	3.50	2.00	16.00
Drop Floor (Street Side) OEM Ref P.N.; 1400118	D35LL-7-16	3790005423	3.50	2.00	16.00
Bulkhead Lock OEM Ref P.N.; 1400046	N/A		2.00		
Body Lift, 35 Yard Body OEM Ref P.N.; 1400147	SD52CB-3-84	3771532070	Telescopic		84.00
Body Lift, 23 Yard Body OEM Ref P.N.; 1400148	SD52CB-3-70	3771532069	Telescopic		70.00

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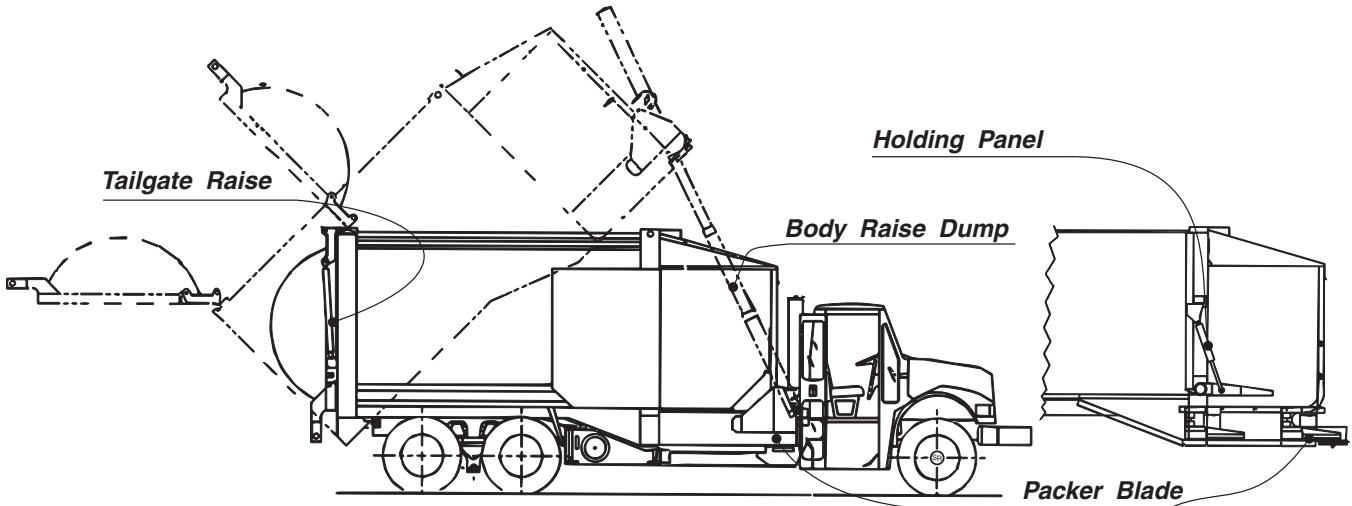
Kann Manufacturing One Pass



<u>Cylinder Function</u>	<u>Parker Eng#</u>	<u>Parker Number</u>	<u>Bore</u>	<u>Rod</u>	<u>Stroke</u>
Arm / Lift OEM Ref P.N.; 1400103	B4773	3790004773	3.50	2.00	38.00
Fork / Tilt OEM Ref P.N.; 1400101	D30CD-13-28	3770521128	3.00	1.75	28.00
Self-Leveling; Fork OEM Ref P.N.; 1400102, 3701054	B4775	3790004775	3.00	1.75	36.00
Top Compactor OEM Ref P.N.; 1400104, P4074-1	SD52CC-29-72	3771532074	Telescopic		72.00
Bottom Compactor OEM Ref P.N.; 1400106	D65CC-9-66	3773921049	6.50	4.00	66.00
Tailgate Raise OEM Ref P.N.; 1400102	B4775	3790004775	3.00	1.75	36.00
Body Lift OEM Ref P.N.; 1400105, P4073-1	SD62CB-13-84	3771432080	Telescopic		84.00

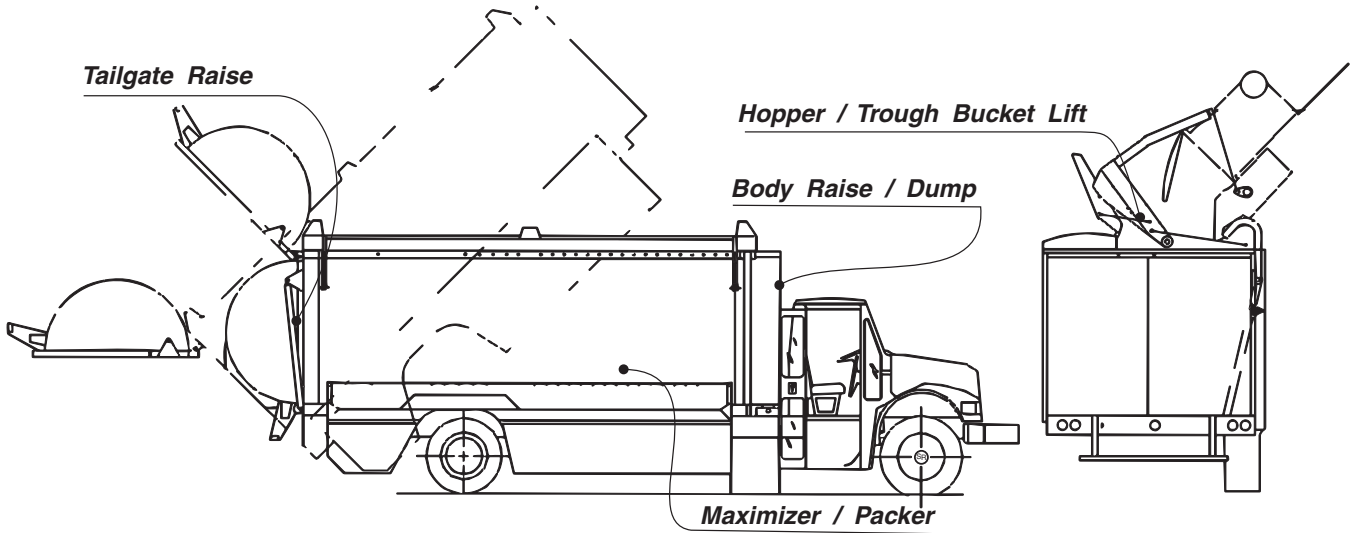
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Labrie Expert 2000 Manual Side Loader



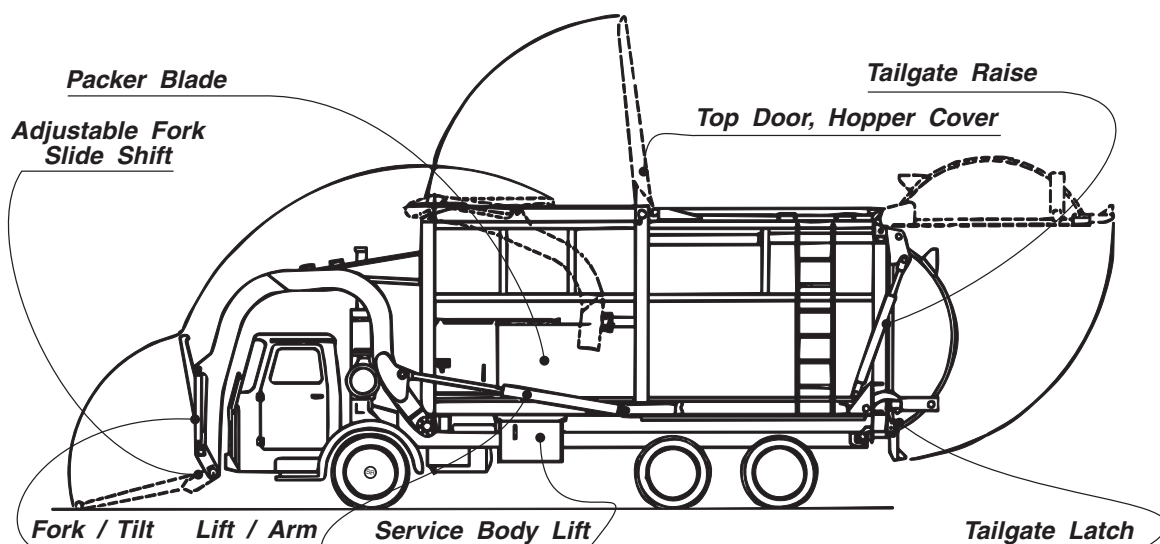
<u>Cylinder Function</u>	<u>Parker Eng#</u>	<u>Parker Number</u>	<u>Bore</u>	<u>Rod</u>	<u>Stroke</u>
Packer Blade OEM Ref P.N.'s; 020-9431-20, HYC00510	D50DC-4-40	3771521170	5.00	3.00	40.00
Holding Panel, Crusher Panel OEM Ref P.N.'s; HYC00360	D25DD-6-14.50	3772621141	2.50	1.50	14.50
Tailgate Raise OEM Ref P.N.'s; HYC00320	D25LC-4-39	3772621148	2.50	1.75	38.81
Body Raise / Dump OEM Ref P.N.'s; HYC01450-01	N/A		Telescopic		
Body Raise / Dump OEM Ref P.N.'s; HYC01425-01	N/A		Telescopic		

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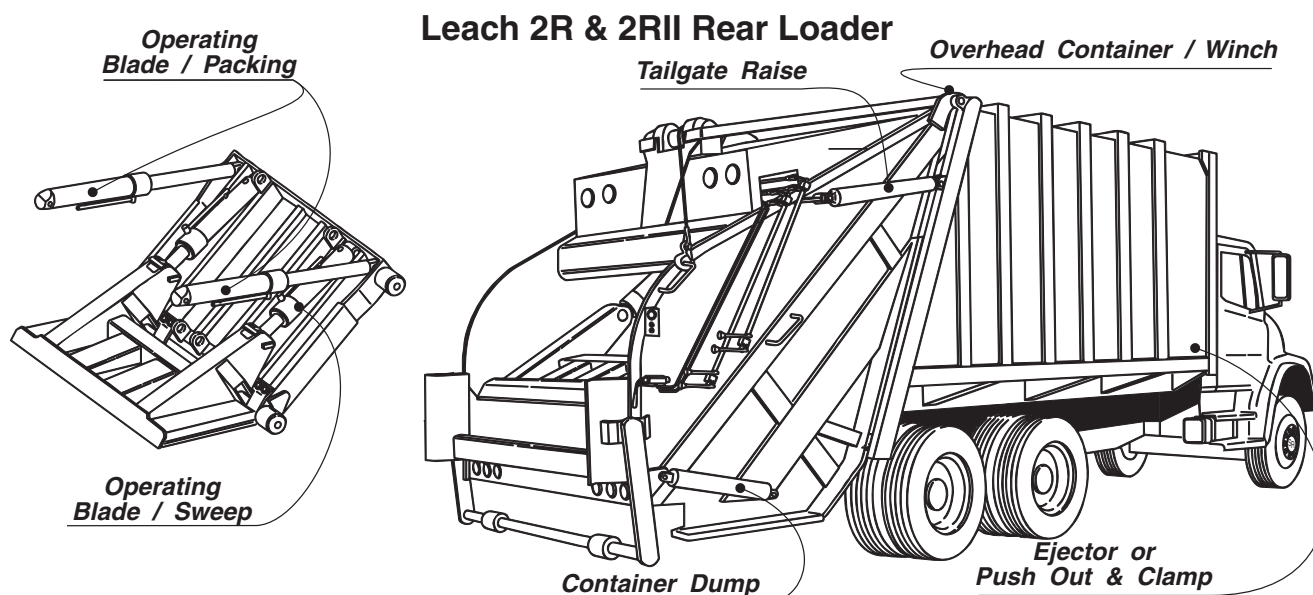
<u>Cylinder Function</u>	<u>Parker Eng#</u>	<u>Parker Number</u>	<u>Bore</u>	<u>Rod</u>	<u>Stroke</u>
Hopper / Trough Bucket Lift, Loading OEM Ref P.N.'s; HYC01550	D32CC-12-15.50	3770721133	3.25	1.50	15.50
Maximizer / Packer OEM Ref P.N.'s; HYC02300	D50DC-5-84.13	3777921074	5.00	3.00	84.13
Tailgate Raise OEM Ref P.N.'s; HYC00315	D25LC-3-28	3772621140	2.50	1.50	28.00
Body Raise / Dump OEM Ref P.N.'s; HYC02010	N/A		Telescopic		

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Leach FL104 & Millennium Front Loader


<u>Cylinder Function</u>	<u>Parker Eng#</u>	<u>Parker Number</u>	<u>Bore</u>	<u>Rod</u>	<u>Stroke</u>
Arm / Lift; Commercial 100" Arm Width OEM Ref P.N.'s; 306459, 306635	D45CL-2-42	3774121028	4.50	2.50	42.00
Arm / Lift; Residential 100" Arm Width OEM Ref P.N.'s; 306636, 305241, 305240, 306465	D45CL-2-44.25	3774121029	4.50	2.50	44.25
Arm / Lift; Commercial 96" Arm Width OEM Ref P.N.'s; 305112, 305127, 306463, 306464, 306633	D45CC-13-42	3774121030	4.50	2.50	42.00
Arm / Lift; Residential 96" Arm Width OEM Ref P.N.'s; 306634	D45CC-13-44.25	3774121031	4.50	2.50	44.25
Fork / Tilt; Commercial OEM Ref P.N.'s; 307534	D35CD-9-26.75	3773821061	3.50	2.00	26.75
Fork / Tilt; Residential OEM Ref P.N.'s; 601131	N/A				
Top Door; Sliding Short Wheel Base OEM Ref P.N.'s; 306462	D25CC-12-87.50	3772621126	2.50	1.50	87.50
Top Door; Sliding Long Wheel Base OEM Ref P.N.'s; 306462	D25CC-12-100.50	3772621127	2.50	1.50	100.50
Top Door; Hinged OEM Ref P.N.'s; 305960, 306466	D20CL-2-12.75	3770121132	2.00	1.25	12.75
Tailgate Raise OEM Ref P.N.'s; 306460	D30LD-5-28.62	3770521095	3.00	2.00	28.63
Packer Blade, Short Wheel Base OEM Ref P.N.'s; 305111, 305687	SD63CC-23-146	3771433064	Telescopic		146.00
Packer Blade, Long Wheel Base OEM Ref P.N.'s; 302525, 303407, 304000, 305688	SD63CC-39-167	3771433906	Telescopic		167.00
Service Body Lift OEM Ref P.N.'s; 302385	D30DD-13-14.25	3770521096	3.00	1.50	14.25

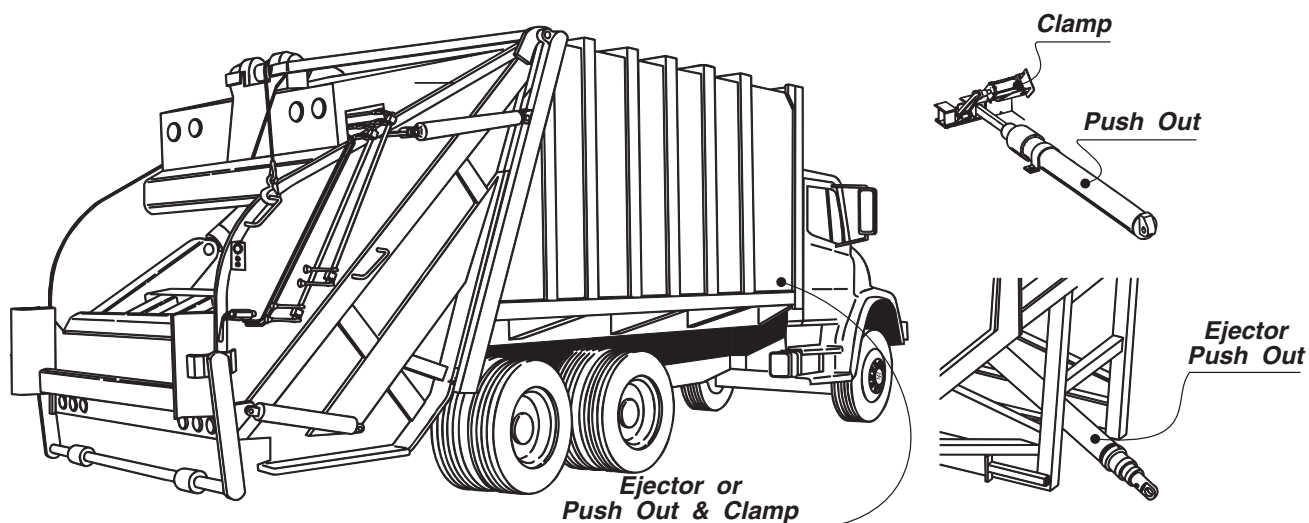
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<u>Cylinder Function</u>	<u>Parker Eng#</u>	<u>Parker Number</u>	<u>Bore</u>	<u>Rod</u>	<u>Stroke</u>
Operating, Blade Packing & Sweep: SN 0001-8993 OEM Ref P.N.'s: 2R1006A, 304805	D60BC-5-30.31 536	3771421251 + 536 Kit	6.00	4.50	30.25
Operating, Blade Packing & Sweep: SN 8997-10999 OEM Ref P.N.'s: 2R1008R, 32046, 300679, 300900, 300990, 303904, 305827, 306562	D60BC-5-30.31 495	3771421251 + 496 Kit	6.00	4.50	30.25
Operating, Blade Packing & Sweep: SN 11000-15999 OEM Ref P.N.'s: 304168, 307081, 620568	D60BC-5-30.31	3771421251	6.00	4.50	30.25
Operating, Blade Packing & Sweep: SN 16000-UP OEM Ref P.N.'s: 700081, 717488	D60BC-5-30.31 528	3771421251 + 528 Kit	6.00	4.50	30.25
Operating, Blade / Sweep, Tag Axle: SN 11000-15999 OEM Ref P.N.'s: 307082, 620509, 700289	D60BC-6-27.81	3771421256	6.00	4.50	27.81
Tailgate Raise: SN 0001-15999 OEM Ref P.N.'s: PO265, 400753, 401056, 402160, 402324, 405089, 405114, 406369, 406399, 406639, 601429	S41LC-1-39.38	3771011057	4.00	2.25	39.38
Tailgate Raise: SN 16000-UP OEM Ref P.N.'s: 210629, 701479, 709174	S35CL-2-32.69	3776815003	4.00	3.50	32.69
Tailgate Latch: SN 16000-UP OEM Ref P.N.'s: 306845	N/A				
Overhead Container Winch Reeving: SN 0001-UP OEM Ref P.N.'s: 305975, 402087, 406582	D60CF-2-57	3771421223	6.00	4.50	57.00
Container Dump: SN 0001-15999 OEM Ref P.N.'s: 15373, 401207, 405964, 605250	D40CD-11-15	3776821074	4.00	2.00	15.00
Container Dump Standard: SN 16000-UP OEM Ref P.N.'s: 407028	D40CL-3-23.50	3776821076	4.00	2.00	23.38
Container Dump Tag Axle: SN 16000-UP OEM Ref P.N.'s: 605252	N/A				

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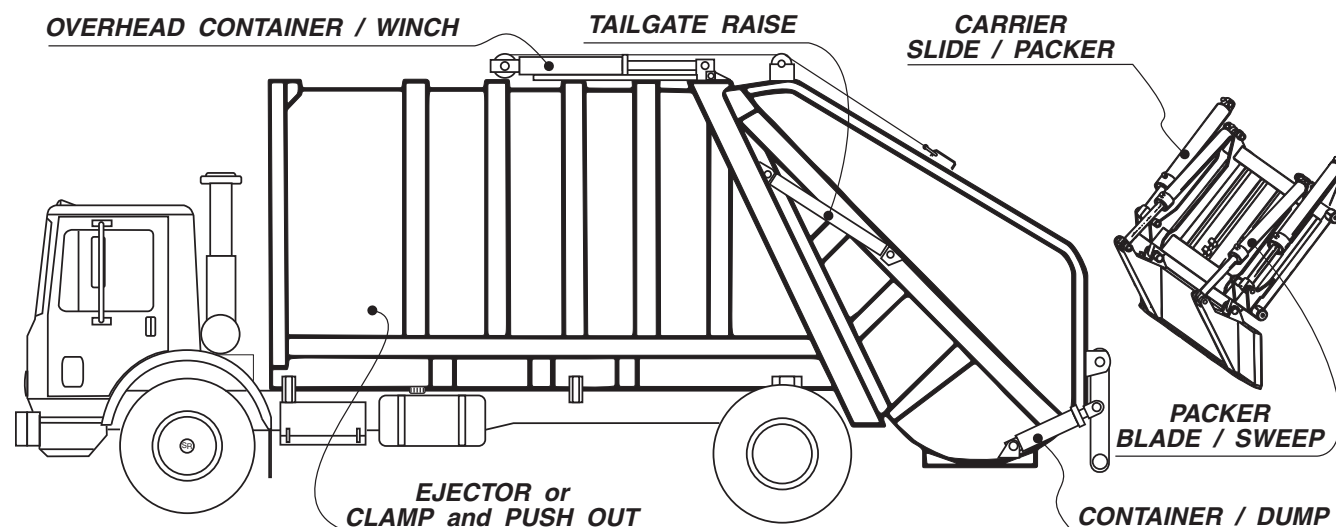
Leach 2R & 2RII Rear Loader



<u>Cylinder Function</u>	<u>Parker Eng#</u>	<u>Parker Number</u>	<u>Bore</u>	<u>Rod</u>	<u>Stroke</u>
Push Out, Clamp Style: SN 0001-15999 OEM Ref P.N.'s; PO1166, 41354, 41357, 305972, 400383, 406368	D60CF-3-32.38	3771421225	6.00	4.50	33.88
Clamp, Clamp Style: SN 0001-15999 OEM Ref P.N.'s; 400496, 406370	S21LL-2-1.5	3771411106	6.00	1.75	1.50
Ejector Push Out, 20 Yd: SN 0001-9719 OEM Ref P.N.'s; 41297	SD84CC-11-104	3772934012	Telescopic		104.00
Ejector Push Out, 25 Yd: SN 0001-9719 OEM Ref P.N.'s; 41296, 41298	SD85CC-15-125	3772935003	Telescopic		125.00
Ejector Push Out, 31 Yd: SN 0001-9719 OEM Ref P.N.'s; 39726	SD86CC-1-171	3772936001	Telescopic		171.00
Ejector Push Out, 20 Yd: SN 9720-Up OEM Ref P.N.'s; 209785, 718909	SD63DC-19-81	3771433946	Telescopic		82.84
Ejector Push Out, 25 Yd: SN 9720Up OEM Ref P.N.'s; 209786, 718878	SD63DC-19-101	3771433937	Telescopic		101.75
Ejector Push Out, 29 Yd: SN 9720-Up OEM Ref P.N.'s; 704045	N/A				
Ejector Push Out, 31 Yd: SN 9720-Up OEM Ref P.N.'s; 209787, 718876	SD64DC-5-145	3771434054	Telescopic		145.00
Ejector Push Out, 33 Yd: SN 9720-Up OEM Ref P.N.'s; 210847, 718912	SD64DC-5-156	3771434055	Telescopic		156.64
For Horizontal "Demolition" type Ejector Push Out, refer to SN 0-9719					

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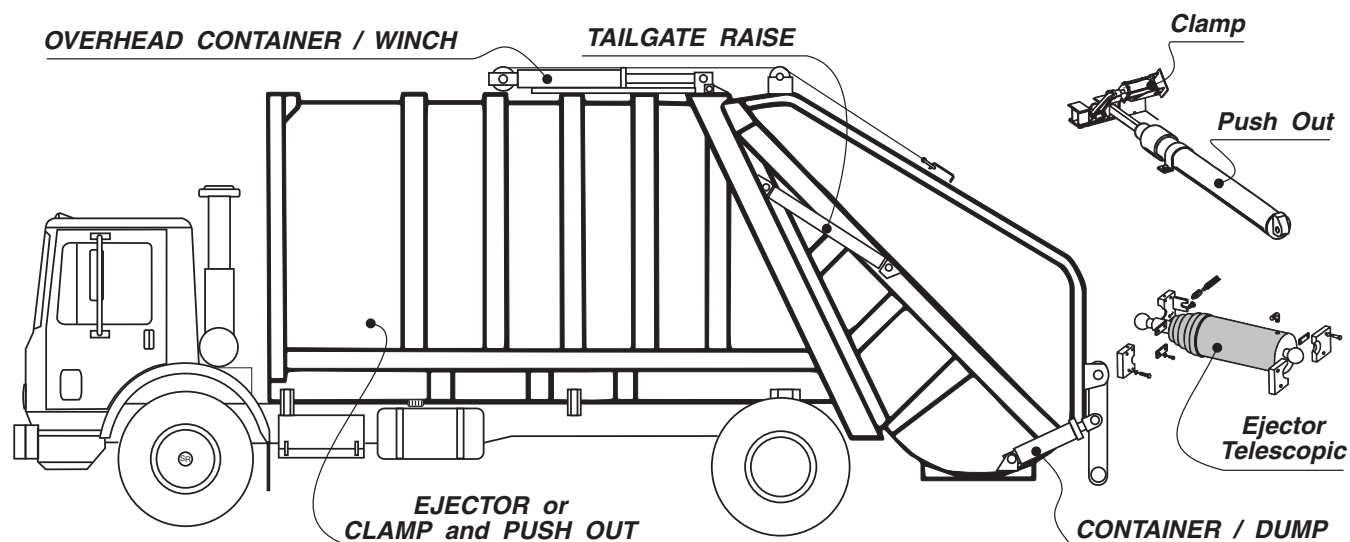
Leach Alpha, Beta and Delta Rear Loader



<u>Cylinder Function</u>	<u>Parker Eng#</u>	<u>Parker Number</u>	<u>Bore</u>	<u>Rod</u>	<u>Stroke</u>
Packer, Blade / Sweep: Alpha S/N 3500-Up OEM Ref P.N.'s; 210658	D45CC-16-32.50	3774121037	4.50	2.50	32.50
Packer, Blade / Sweep: Alpha S/N1- 3499, Beta 1-Up OEM Ref P.N.'s; 404411, 406578	D50CB-9-32.50	3777921067	5.00	3.50	32.50
Packer, Blade / Sweep: Delta OEM Ref P.N.'s; 601366	N/A				
Slide / Packer: Alpha S/N 3500-Up OEM Ref P.N.'s; 210659	D55CC-8-37	3771921040	5.50	2.50	37.00
Slide / Packer: Alpha S/N1- 3499, Beta 1-Up OEM Ref P.N.'s; 401965, 402735, 406577	N/A		6.00		
Slide / Packer: Delta OEM Ref P.N.'s; 210628	N/A				
Tailgate Raise: Alpha & Beta S/N 3500-Up OEM Ref P.N.'s; 210629, 701479	S35CL-2-32.69	3776815003	4.00	3.50	32.69
Tailgate Raise: Alpha & Beta S/N 1-3499 OEM Ref P.N.'s; 402051, 405112, 406579	N/A				
Tailgate Raise OEM Ref P.N.'s; 402050	N/A				
Container Dump; S/N 1-3499 OEM Ref P.N.'s; 605600	N/A				
Container Dump; Alpha & Beta S/N 3500-Up OEM Ref P.N.'s; 407028	D40CL-3-23.50	3776821076	4.00	2.00	23.50
Container Dump OEM Ref P.N.'s; 401967	N/A				
Container Dump OEM Ref P.N.'s; 401982	N/A				
Overhead Container Reeving OEM Ref P.N.'s; 305975, 402087, 406582	D60CF-2-57	3771421223	6.00	4.50	57.00

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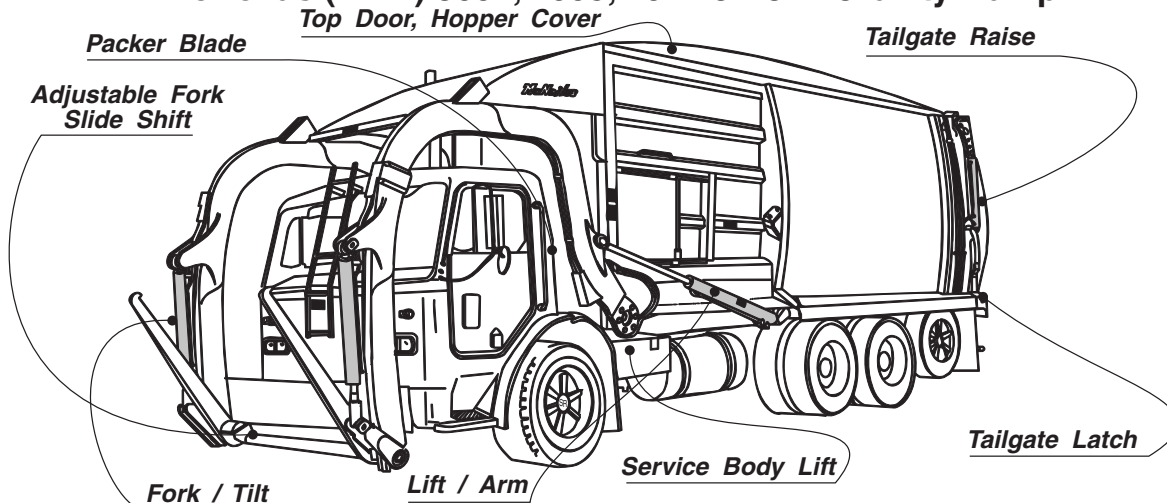
Leach Alpha, Beta and Delta Rear Loader



<u>Cylinder Function</u>	<u>Parker Eng#</u>	<u>Parker Number</u>	<u>Bore</u>	<u>Rod</u>	<u>Stroke</u>
Ejector Push Out, 14 Yd S/N 3500-Up OEM Ref P.N.'s; 210630-1	N/A				
Ejector Push Out, 16 Yd S/N 1-3499 OEM Ref P.N.'s; 200870	SD6400-1-87	3771434023	Telescopic		87.00
Ejector Push Out, 16 Yd S/N 3500-Up OEM Ref P.N.'s; 210630-2	N/A				
Ejector Push Out, 18 Yd S/N 1-3499 OEM Ref P.N.'s; 200869	SD7500-1-100	3772535004	Telescopic		100.00
Ejector Push Out, 18 Yd S/N 3500-Up OEM Ref P.N.'s; 210630-3	N/A				
Ejector Push Out, 20 Yd S/N 1-3499 OEM Ref P.N.'s; 200868	SD7500-2-113	3772535005	Telescopic		111.00
Ejector Push Out, 20 Yd S/N 3500-Up OEM Ref P.N.'s; 210630-4	N/A				
Ejector Push Out, 25 Yd S/N 1-3499 OEM Ref P.N.'s; 201500	SD8600-1-146	3772936002	Telescopic		146.00
Ejector Push Out, 25 Yd S/N 3500-Up OEM Ref P.N.'s; 210630-5	N/A				
Ejector Clamp, Clamp Style S/N 3500-Up OEM Ref P.N.'s; 303163, 406580	N/A				
Ejector Push Out, Clamp Style S/N 3500-Up OEM Ref P.N.'s; 403260	N/A				

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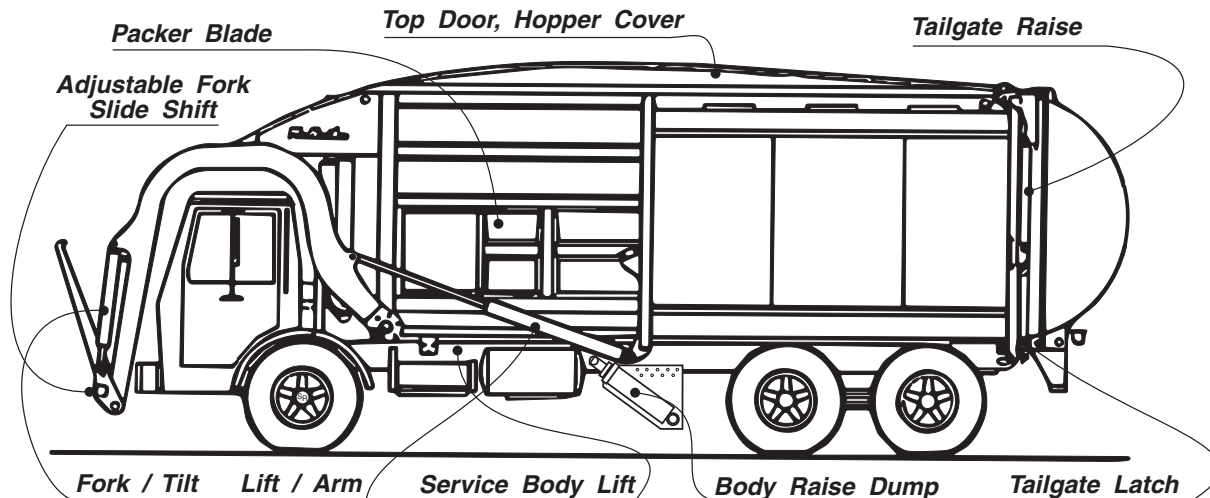
McNeilus (MTM) 3604, 4004, 4304, 4504, 4020, 4320 & 4520 Full Eject McNeilus (MTM) 3604, 4005, 4022 & 4322 Gravity Dump



<u>Cylinder Function</u>	<u>Parker Eng#</u>	<u>Parker Number</u>	<u>Bore</u>	<u>Rod</u>	<u>Stroke</u>
Arm / Lift OEM Ref P.N.'s: 0619891, 0619891, 1000069, 1144708 9570.614366, 9570.614380, 9570.619891	D45CC-20-46	3774121043	4.50	2.50	46.00
Arm / Lift OEM Ref P.N.'s: 0604120, 9272.604120, 9570.604120	D4195	3790004195	5.00	2.50	44.55
Fork / Tilt OEM Ref P.N.'s: 0614333, 1000068, 1144704, 9070.614333, 9570.614333	D35CC-27-26	3773821085	3.50	2.00	26.00
Fork / Tilt, Threaded Rod Eye OEM Ref P.N.'s: 9272.604121, 9570.604121	D40CC-29-26	3776821108	4.00	2.00	26.00
Fork / Tilt, with Special Valving OEM Ref P.N.'s: 9570.619980	B5864	3790005864	3.50	2.00	26.00
Adjustable Fork / Slide Shift OEM Ref P.N.'s: 0617862, 9570.617862	B4708	3790004708	2.00	1.25	20.00
Top Door OEM Ref P.N.'s: 0614371, 0660778, 1000077, 1000160, 1144702, 9170.614371, 9170.660778, 9172.604147	D20DD-8-95	3770121144	2.00	1.50	95.00
Tailgate Raise OEM Ref P.N.'s: 0619881, 1000066, 1149602, 9370.614365, 9370.619881, 9370.914365	C5219	3790005219	3.25	2.00	31.00
Tailgate Raise OEM Ref P.N.'s: 0619882, 1000067, 1144703, 9272.604127, 9370.604127, 9370.619882	D32LL-11-38	3770721137	3.25	2.00	38.00
Packer Blade, 40 Yd Full Eject OEM Ref P.N.'s: 0604124, 1000081, 1181025, 9270.604124, 9272.604124, 9370.604124, 9470.604124	SD53CC-48-164	3771933024	Telescopic		164.00
Packer Blade, 45 Yd Full Eject OEM Ref P.N.'s: 0614374, 1100116, 1151023, 9270.614374	SD53CC-48-170	3771933027	Telescopic		170.00
Service Body Lift OEM Ref P.N.'s: 0619884, 1000078, 9170.619884	S28CC-1-16	3776721044	2.88	2.50	16.00
Packer Blade, Gravity Dump OEM Ref P.N.'s: 0604126, 1100038, 1151008, 9272.604126	D60DC-13-65.75	3771421247	6.00	4.00	65.75
Body Raise, Gravity Dump OEM Ref P.N.'s: 0642852, 1148536, 9170.642852, 9770.640888	S53DB-22-63	3771513182	Telescopic		63.12

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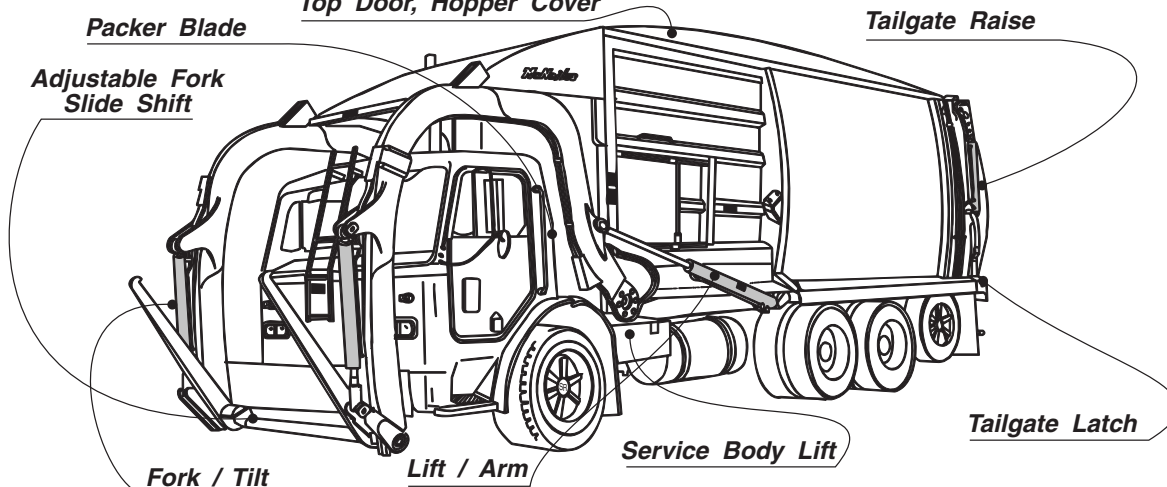
**McNeilus (MTM) 3629, 4029, 4329, 4529 Atlantic Full Eject
McNeilus (MTM) 3624, 4024, 4324 & 4524 Atlantic Gravity Dump**



<u>Cylinder Function</u>	<u>Parker Eng#</u>	<u>Parker Number</u>	<u>Bore</u>	<u>Rod</u>	<u>Stroke</u>
Arm / Lift OEM Ref P.N.'s: 0614366, 0619891, 1000069, 1144708, 9570.614366, 9570.614380, 9570.619891	D45CC-20-46	3774121043	4.50	2.00	46.00
Fork / Tilt OEM Ref P.N.'s: 0614333, 1000068, 1144704 9070.614333, 9570.614333	D35CC-27-26	3773821085	3.50	2.00	26.00
Fork / Tilt, with Special Valving OEM Ref P.N.'s: 9570.619980	B5864	3790005864	3.50	2.00	26.00
Adjustable Fork / Slide Shift OEM Ref P.N.'s: 0617862, 9570.617862	B4708	3790004708	2.00	1.25	20.00
Top Door OEM Ref P.N.'s: 0614371, 0660778, 1000077, 1000160, 1144702, 9170.614371, 9170.660778, 9172.604147	D20DD-8-95	3770121144	2.00	1.50	95.00
Top Door (Long Lightweight) OEM Ref P.N.'s: 1145516, 9170.619880, 9170.660012	D20DD-8-107	3770121139	2.00	1.50	107.00
Tailgate Raise OEM Ref P.N.'s: 0619882, 1000067, 1144703 9272.604127, 9370.604127, 9370.619882	D32LL-11-38	3770721137	3.25	2.00	38.00
Packer Blade, 40 Yd Full Eject OEM Ref P.N.'s: 0661950, 1130000, 1140624, 1144059, 1254376, 9430.661950	SD63CC-44-164	3771833011	Telescopic		164.00
Packer Blade, 45 Yd Full Eject OEM Ref P.N.'s: 0661951, 1130001, 1140625, 1142458, 1237812, 9430.661951	SD63CC-44-181	3771833010	Telescopic		181.00
Service Body Lift OEM Ref P.N.'s: 0619884, 1000078, 9170.619884	S28CC-1-16	3776721044	2.88	2.50	16.00
Packer Blade, Atlantic Gravity Dump OEM Ref P.N.'s: 1101709, 1149601	D60CC-45-65.75	3775921011	6.00	4.00	65.75
Body Raise, Atlantic Gravity Dump OEM Ref P.N.'s: 0126158, 1148497, 9070.126158	S63DC-77-66	3771413258	Telescopic		66.00

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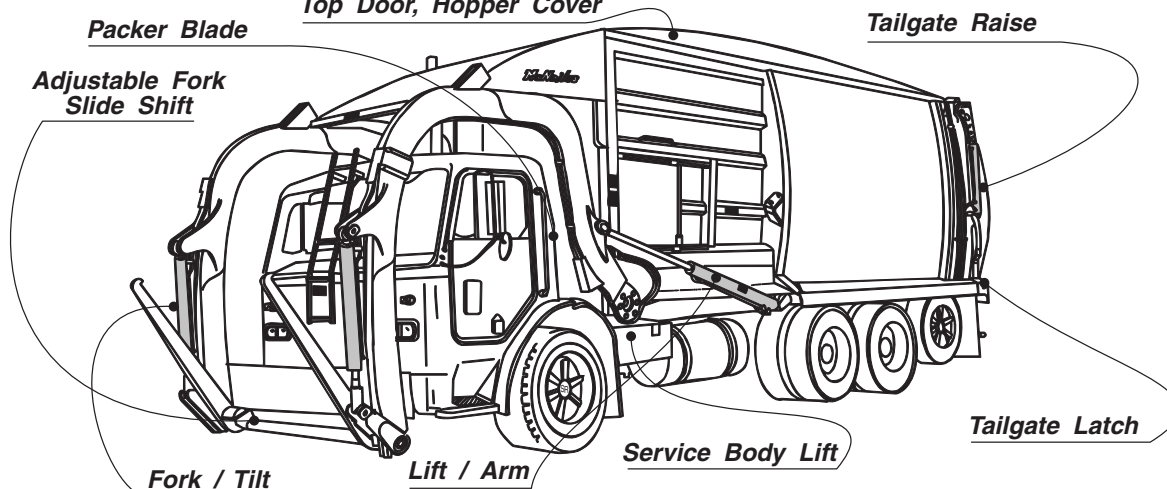
McNeilus (MTM) 4080, 4081, 4380 & 4381 Pacific McNeilus (MTM) 4082, 4382 Low Profile Pacific



<u>Cylinder Function</u>	<u>Parker Eng#</u>	<u>Parker Number</u>	<u>Bore</u>	<u>Rod</u>	<u>Stroke</u>
Arm / Lift OEM Ref P.N.'s: 0660777, 1000158, 1145515, 9570.660777	D40CC-28-46	3776821107	4.00	2.00	46.00
Fork / Tilt OEM Ref P.N.'s: 0619876, 9570.619876	D30CD-9-20	3790005461	3.00	1.75	20.00
Fork / Tilt OEM Ref P.N.'s: 0660009, 0660781, 1100028, 9570.660009, 9570.660781	D30CD-12-20	3775421003	3.00	1.75	20.00
Fork / Tilt OEM Ref P.N.'s: 0660011, 9570.660011	B6353	3790006353	3.50	2.00	20.00
Adjustable Fork / Slide Shift OEM Ref P.N.'s: 0617862, 1144705, 9570.617862, 9570.660782	B4708	3790004708	2.00	1.25	20.00
Top Door OEM Ref P.N.'s: 0614371, 0660778, 1000077, 1000160, 1144702, 9170.614371, 9170.660778, 9172.604147	D20DD-8-95	3770121144	2.00	1.50	95.00
Top Door OEM Ref P.N.'s: 1145516, 9170.619880, 9170.660012	D20DD-8-107	3770121139	2.00	1.50	107.00
Tailgate Raise OEM Ref P.N.'s: 0637009, 1000161, 9370.637009	D25LL-19-38	3772621150	2.50	1.50	38.00
Tailgate Raise OEM Ref P.N.'s: 0637010, 1100105, 1144707, 9370.637010	D25LL-20-38	3772621153	2.50	1.50	38.00
Packer Blade OEM Ref P.N.'s: 0660776, 1000157, 1148495, 9170.660776	SD53DD-CP592-170	3799000592	Telescopic		170.00
Service Body Lift OEM Ref P.N.'s: 0619884, 1000078, 9170.619884	S28CC-1-16	3776721044	2.88	2.50	16.00
Packer Blade, Gravity Dump OEM Ref P.N.'s: 9570.660785	B6422	3790006422	5.50	3.50	66.19
Body Raise, Gravity Dump OEM Ref P.N.'s: 0126158, 1148497, 9070.126158	S63DC-77-66	3771413258	Telescopic		66.00
Body Raise, Gravity Dump OEM Ref P.N.'s: 0633832, 1148537, 9170.633832	S75DB-CP394-86	3799000394	Telescopic		86.25

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NO OTHER CONDITIONS ARE EXPRESSED OR IMPLIED.

**McNeilus (MTM) 4027, 4327 Lightweight Century Full Eject
McNeilus (MTM) 4028, 4328 Lightweight Century Half Pack Dump**



<u>Cylinder Function</u>	<u>Parker Eng#</u>	<u>Parker Number</u>	<u>Bore</u>	<u>Rod</u>	<u>Stroke</u>
Arm / Lift OEM Ref P.N.'s: 0619877, 9570.619877	B5462	3790005462	4.00	2.50	46.00
Arm / Lift OEM Ref P.N.'s: 0614366, 0619891, 1000069, 1144708, 9570.614366, 9570.614380, 9570.619891	D45CC-20-46	3774121043	4.50	2.50	46.00
Fork / Tilt OEM Ref P.N.'s: 0619876, 9570.619876	D30CD-9-20	3790005461	3.00	1.75	20.00
Fork / Tilt OEM Ref P.N.'s: 0614333, 1000068, 1144704, 9070.614333, 9570.614333	D35CC-27-26	3773821085	3.50	2.00	26.00
Fork / Tilt, With Counter Balance Valve OEM Ref P.N.'s: 0618928, 9370.618928, 9570.618928	B5780	3790005780	3.50	2.00	26.00
Adjustable Fork / Slide Shift OEM Ref P.N.'s: 0617862, 1144705, 9570.617862, 9570.660782	B4708	3790004708	2.00	1.25	20.00
Top Door OEM Ref P.N.'s: 1145516, 9170.619880, 9170.660012	D20DD-8-107	3770121139	2.00	1.50	107.00
Tailgate Raise OEM Ref P.N.'s: 0642853, 1000075, 9370.642853	B5491	3790005491	3.00	2.00	31.00
Packer Blade OEM Ref P.N.'s: 9270.614373, 9470.619878	D5753	3790005753	Telescopic		149.00
Service Body Lift OEM Ref P.N.'s: 0619884, 1000078, 9170.619884	S28CC-1-16	3776721044	2.88	2.50	16.00
Packer Blade, Gravity Dump OEM Ref P.N.'s: 9170.619875	B5454	3790005454	5.00	3.00	59.00
Body Raise, Gravity Dump, 36 YD OEM Ref P.N.'s: 0615862, 9270.615862, 9770.615862	S64DB-10-73	3771414053	Telescopic		73.00
Body Raise, Gravity Dump, 39 YD OEM Ref P.N.'s: 0633832, 1148537, 9170.633832	S75DB-CP394-86	3799000394	Telescopic		86.00

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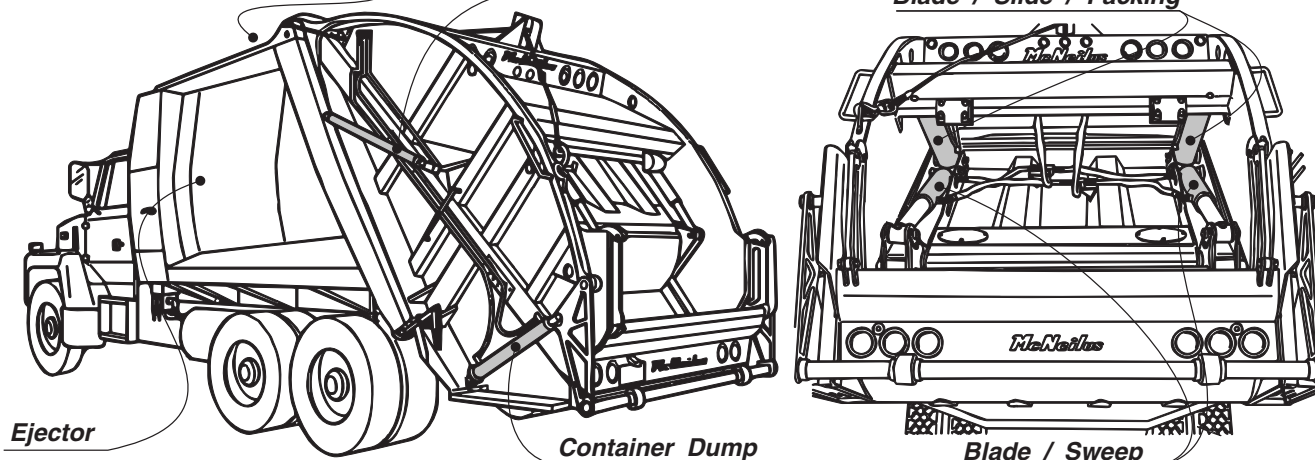
McNeilus (MTM) Standard & Heavy Duty Rear Loader

1710, 2010, 2510, 3210 Standard & 1711, 2011, 2511, 3211 Heavy Duty

Overhead Container / Winch

Tailgate Raise

Blade / Slide / Packing

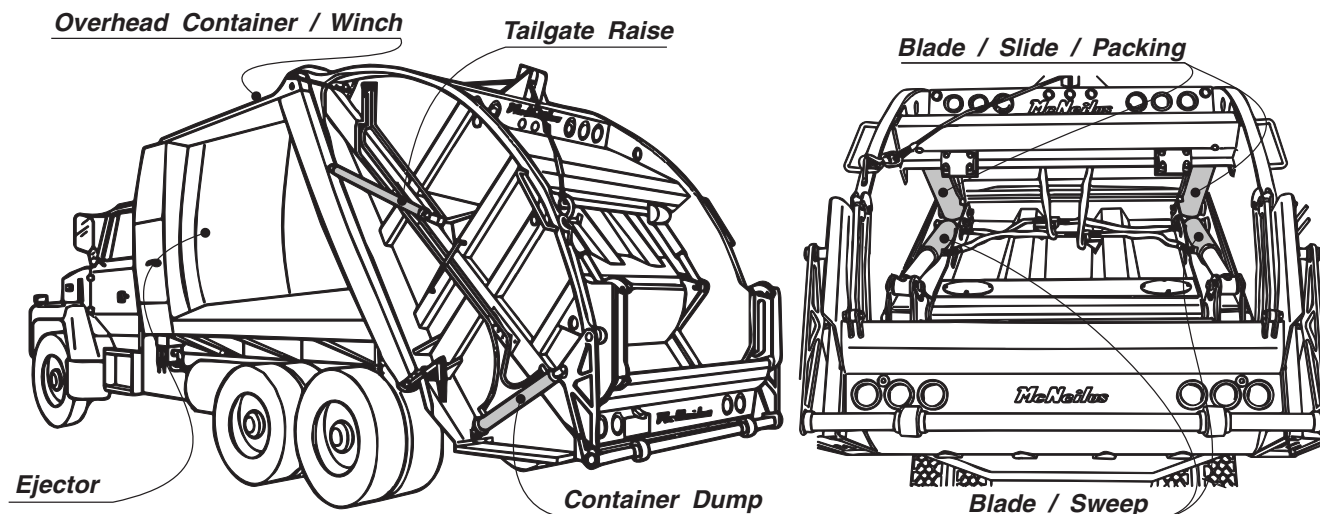


<u>Cylinder Function</u>	<u>Parker Eng#</u>	<u>Parker Number</u>	<u>Bore</u>	<u>Rod</u>	<u>Stroke</u>
Blade / Slide / Packing, Standard OEM Ref P.N.'s; 0604144, 1109366, 9470.604144	D4292	3790004292	4.50	3.50	32.50
Blade / Slide / Packing, Heavy Duty OEM Ref P.N.'s; 0604146, 1108291, 9470.604146	D50DD-30-32.50	3777921098	5.00	4.00	32.50
Blade / Sweep, Standard OEM Ref P.N.'s; 0604143, 1109367, 9470.604143	D4291	3790004291	4.00	3.00	23.00
Blade / Sweep, Heavy Duty OEM Ref P.N.'s; 0604145, 1108292, 9470.604145	D45DD-9-23	3774121049	4.50	3.50	23.00
Tailgate Raise OEM Ref P.N.'s; 0601930, 1108290, 9072.601930, 9072.601940, 9370.601930, 9370.604130	S28CC-2-38.00	3776718001	2.88	2.50	38.00
Overhead Container Winch Reeving OEM Ref P.N.'s; 0605700, 1109369, 9072.601492, 9170.605700, 9370.605700, 9970.604129	B5473	3790005473	5.00	3.50	50.00
Container Dump, Crash Bar OEM Ref P.N.'s; 1109749, 9370.605701	D25LL-17-12.00	3772621145	2.50	1.50	12.00
Container Dump OEM Ref P.N.'s; 0605702, 1100117, 1109370, 9370.605702, 9572.601691, 9970.601691	D30CL-5-24	3770521130	3.00	1.75	24.00
Ejector Push Out, 17 Yd OEM Ref P.N.'s; 0604139, 1148073, 9270.604139	SD63DC-74-71.75	3771433939	Telescopic		71.75
Ejector Push Out, 20 Yd OEM Ref P.N.'s; 0604142, 1148074, 9072.604142, 9270.604142, 9272.604142	SD63DC-7-88	3771433071	Telescopic		88.75
Ejector Push Out, 25 Yd OEM Ref P.N.'s; 0604137, 1147920, 9072.604137, 9270.604137	SD74DC-7-119	3772534040	Telescopic		119.50
Ejector Push Out, 28 Yd OEM Ref P.N.'s; 1147929, 9070.670032	SD74DC-CP615-138	3799000615	Telescopic		138.00
Ejector Push Out, 32 Yd OEM Ref P.N.'s; 0604138, 1148075, 9072.604138, 9270.604138	SD85DC-7-163	3772935036	Telescopic		163.00

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McNeilus (MTM) XC High Compaction Rear Loader

2003, 2503, 3203, 2013, 2513, 3213, XC

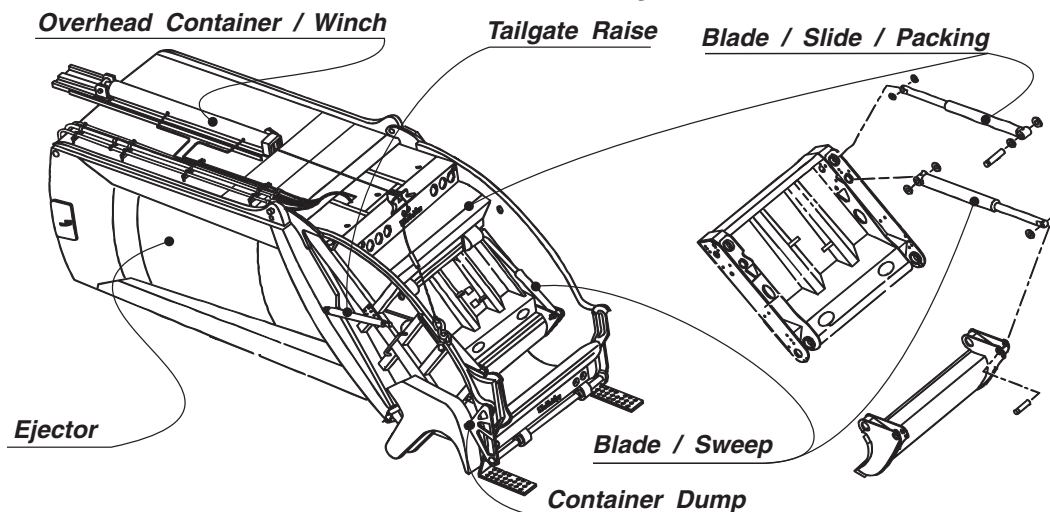


<u>Cylinder Function</u>	<u>Parker Eng#</u>	<u>Parker Number</u>	<u>Bore</u>	<u>Rod</u>	<u>Stroke</u>
Blade / Slide / Packing OEM Ref P.N.'s; 0604135, 1108286, 9072.604135, 9470.604135	D55DD-14-38.62	3771921049	5.50	4.50	38.62
Blade / Sweep OEM Ref P.N.'s; 0604134, 1108287, 9072.604134, 9470.604134	D50DD-29-25.62	3777921097	5.00	3.00	23.00
Tailgate Raise OEM Ref P.N.'s; 0604136, 1108293, 9370.604136	S31CB-2-42	3773811005	3.50	3.00	42.00
Overhead Container Winch Reeving OEM Ref P.N.'s; 0605700, 1109369, 9072.601492, 9170.605700, 9370.605700, 9970.604129	B5473	3790005473	5.00	3.50	50.00
Container Dump, Crash Bar OEM Ref P.N.'s; 1109749, 9370.605701	D25LL-17-12.00	3772621145	2.50	1.50	12.00
Container Dump OEM Ref P.N.'s; 0605702, 1100117, 1109370, 9370.605702, 9572.601691, 9970.601691	D30CL-5-24	3770521130	3.00	1.75	24.00
Ejector Push Out, 17 Yd OEM Ref P.N.'s; 0604139, 1148073, 9270.604139	SD63DC-74-71.75	3771433939	Telescopic		71.75
Ejector Push Out, 20 Yd OEM Ref P.N.'s; 0604142, 1148074, 9072.604142, 9270.604142, 9272.604142	SD63DC-7-88	3771433071	Telescopic		88.75
Ejector Push Out, 25 Yd OEM Ref P.N.'s; 0604137, 1147920, 9072.604137, 9270.604137	SD74DC-7-119	3772534040	Telescopic		119.50
Ejector Push Out, 28 Yd OEM Ref P.N.'s; 1147929, 9070.670032	SD74DC-CP615-138	3799000615	Telescopic		138.00
Ejector Push Out, 32 Yd OEM Ref P.N.'s; 0604138, 1148075, 9072.604138, 9270.604138	SD85DC-7-163	3772935036	Telescopic		163.00

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McNeilus (MTM) Tag Axle Rear Loader

2012, 2512, 3212 Tag Axle

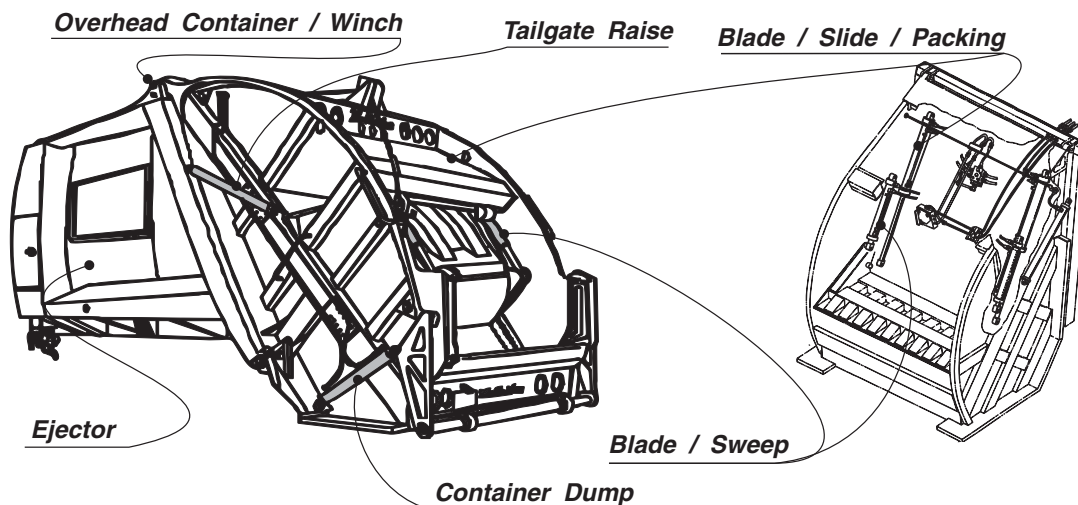


<u>Cylinder Function</u>	<u>Parker Eng#</u>	<u>Parker Number</u>	<u>Bore</u>	<u>Rod</u>	<u>Stroke</u>
Blade / Slide / Packing OEM Ref P.N.'s: 0604976, 1109368, 9970.604976	D50DD-32-37.25	3777921102	5.00	4.00	37.25
Blade / Sweep OEM Ref P.N.'s: 0604145, 1108292, 9470.604145	D45DD-9-23	3774121049	4.50	3.50	23.00
Tailgate Raise OEM Ref P.N.'s: 0604136, 9370.604136	S31CB-2-42	3773811005	3.50	3.00	42.00
Overhead Container Winch Reeving OEM Ref P.N.'s: 0605700, 1109369, 9072.601492, 9170.605700, 9370.605700, 9970.604129	B5473	3790005473	5.00	3.50	50.00
Container Dump, Crash Bar OEM Ref P.N.'s: 1109749, 9370.605701	D25LL-17-12.00	3772621145	2.50	1.50	12.00
Container Dump OEM Ref P.N.'s: 1109748, 9970.604975	C4750	3790004750	3.00	1.75	13.50
Ejector Push Out, 20 Yd OEM Ref P.N.'s: 0604142, 1148074, 9072.604142, 9270.604142, 9272.604142	SD63DC-7-88	3771433071	Telescopic		88.75
Ejector Push Out, 25 Yd OEM Ref P.N.'s: 0604137, 1147920, 9072.604137, 9270.604137	SD74DC-7-119	3772534040	Telescopic		119.50
Ejector Push Out, 28 Yd OEM Ref P.N.'s: 1147929, 9070.670032	SD74DC-CP615-138	3799000615	Telescopic		138.00
Ejector Push Out, 32 Yd OEM Ref P.N.'s: 0604138, 1148075, 9072.604138, 9270.604138	SD85DC-7-163	3772935036	Telescopic		163.00

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McNeilus (MTM) Metro Rear Loader

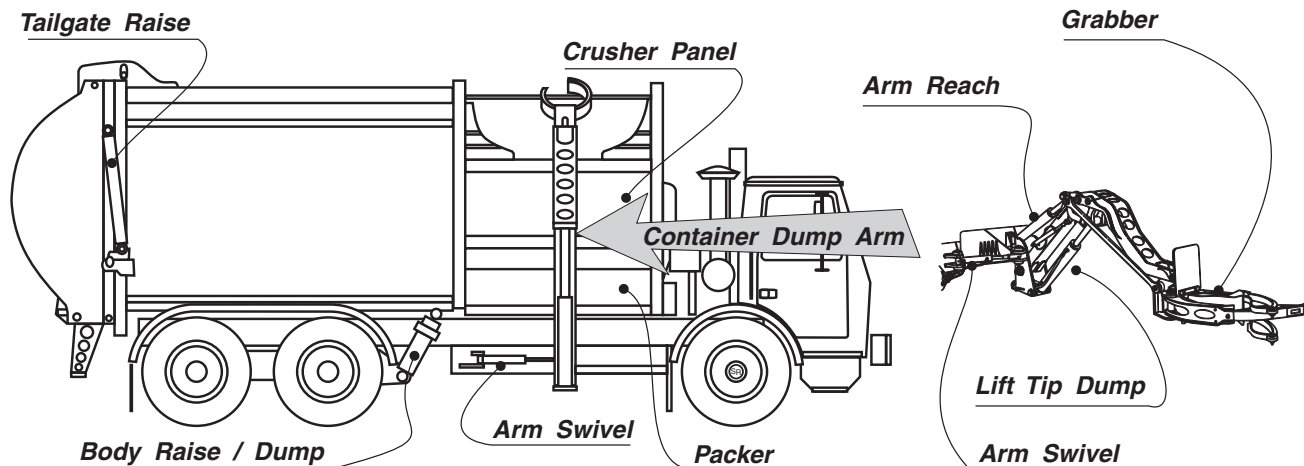
1214, 1414, 1714 & 2014



<u>Cylinder Function</u>	<u>Parker Eng#</u>	<u>Parker Number</u>	<u>Bore</u>	<u>Rod</u>	<u>Stroke</u>
Blade / Slide / Packing OEM Ref P.N.'s: 0606960, 1106959, 1148322, 9470.606690, 9470.606960	C3850	3790003850	4.50	2.00	26.50
Blade / Sweep OEM Ref P.N.'s: 0606950, 1106958, 9270.606950, 9470.606950, 9872.622251	C3847	3790003847	4.00	2.50	21.63
Tailgate Raise OEM Ref P.N.'s: 0606953, 1106957, 9370.606953, 9470.606953	B5347	3790005347	3.00	2.50	31.25
Overhead Container Winch Reeving OEM Ref P.N.'s: 0605700, 1109369, 9072.601492 9170.605700, 9370.605700, 9572.604129	B5473	3790005473	5.00	3.50	50.00
Container Dump OEM Ref P.N.'s: 0605702, 1100117, 9370.605702, 9572.601691, 9970.601691	D30CL-5-24	3770521130	3.00	1.75	24.00
Ejector Push Out, 12 Yd OEM Ref P.N.'s: 0606971, 9270.606971	SD63DC-CP493-46	3799000493	Telescopic		46.62
Ejector Push Out, 14 Yd Old Style OEM Ref P.N.'s: 1148048, 9270.673088	SD52DC-CP627-55	3799000627	Telescopic		55.00
Ejector Push Out, 14 Yd New Style OEM Ref P.N.'s: 0606969, 9270.606969	SD63DC-7-61	3799000441	Telescopic		59.38
Ejector Push Out, 17 Yd New Style OEM Ref P.N.'s: 0673089, 1148072, 9270.673089	SD63DC-75-76	3771433944	Telescopic		76.00
Ejector Push Out, 17 Yd Old Style OEM Ref P.N.'s: 0606967, 9270.606967	SD63DC-CP507-82	3799000507	Telescopic		82.00
Ejector Push Out, 20 Yd Old Style OEM Ref P.N.'s: 0673894, 1148233, 9270.673894, 9270.637984	SD63DC-CP604-97	3799000604	Telescopic		97.25
Ejector Push Out, 20 Yd New Style OEM Ref P.N.'s: 0606956, 9270.606956	SD74DC-CP410-104	3799000410	Telescopic		104.38

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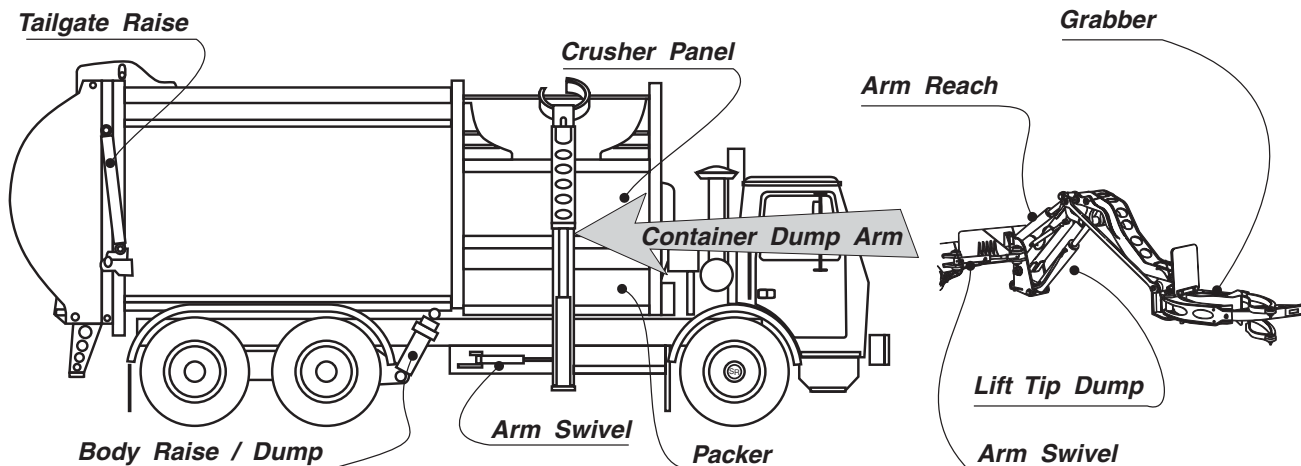
McNeilus (MTM) AutoReach Side Loader
 AutoReach 99, AutoReach, Dual Compartment, Street Force
 Page 1 of 2



<u>Cylinder Function</u>	<u>Parker Eng#</u>	<u>Parker Number</u>	<u>Bore</u>	<u>Rod</u>	<u>Stroke</u>
Grabber OEM Ref P.N.'s; 1132626, 1132629, 1145283 1145648, 1151133, 9570.643706	D20DD-6-6.25	3770121136	2.00	1.00	6.25
Arm Reach OEM Ref P.N.'s; 1145617, 9570.643701	B5495	3790005495	3.50	2.00	14.75
Arm Reach OEM Ref P.N.'s; 1145618, 9070.644203, 9570.643710	B5899	3790005899	3.50	2.00	14.75
Arm Lift, Tip Dump OEM Ref P.N.'s; 1145616, 9570.643705	D35DD-1-17.88	3790005501	3.50	2.00	17.88
Arm Swivel, Swing OEM Ref P.N.'s; 0638264, 1100106, 9070.638264	B6387	3790006387	2.00	1.25	9.12
Arm Swivel, Swing OEM Ref P.N.'s; 1103780, 1145619	B6546	3790006546	2.00	1.25	8.12
Arm Swivel, Swing OEM Ref P.N.'s; 1145284, 9570.643708	D30DD-12-9.12	3790005740	3.00	1.50	9.12
Arm Swivel, Swing, Dual Compartment OEM Ref P.N.'s; 9070.644194	B5698	3790005698	2.50	1.75	15.00
Packer OEM Ref P.N.'s; 0126256, 1100031, 1145282, 1273348, 200.126256	D45DD-10-52.75	3774121054	4.50	3.00	52.75
Packer OEM Ref P.N.'s; 1150957, 200.126257	B6236	3790006236	5.00	3.00	34.50
Packer, Dual Compartment Upper OEM Ref P.N.'s; 9070.644180	B5442	3790005442	3.00	2.00	21.50
Packer, Dual Compartment Lower OEM Ref P.N.'s; 9070.644183	D45DD-7-34.50	3790006002	4.50	3.00	34.50
Crusher Panel, Packer Assist OEM Ref P.N.'s; 0615860, 1000092, 1145280 9170.615860, 9270.615860	C4539	3790004539	3.00	2.00	14.00

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McNeilus (MTM) AutoReach Side Loader
 AutoReach 99, AutoReach, Dual Compartment, Street Force
 Page 2 of 2

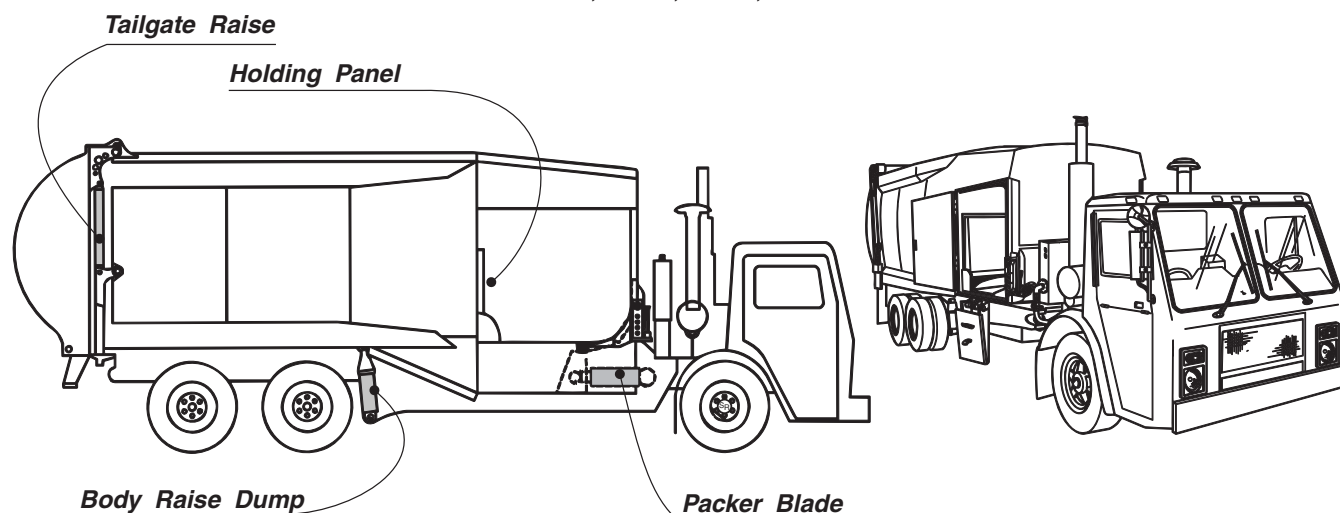


<u>Cylinder Function</u>	<u>Parker Eng#</u>	<u>Parker Number</u>	<u>Bore</u>	<u>Rod</u>	<u>Stroke</u>
Tailgate Raise OEM Ref P.N.'s; 0637009, 1000161, 9370.637009	D25LL-19-38	3772621150	2.50	1.50	38.00
Tailgate Raise OEM Ref P.N.'s; 0637010, 1100105, 1144707 9370.637010	D25LL-20-38	3772621153	2.50	1.50	38.00
Tailgate Raise OEM Ref P.N.'s; 0642853, 1000075, 9370.642853	B5491	3790005491	3.00	2.00	31.00
Tailgate Raise OEM Ref P.N.'s; 0619882, 1000067, 1144703, 9272.604127, 9370.619882, 9370.604127	D32LL-11-38	3770721137	3.25	2.00	38.00
Tailgate Raise, Dual Compartment Upper OEM Ref P.N.'s; 9370.634905	B4942	3790004942	2.00	1.25	12.00
Tailgate Raise, Dual Compartment Lower OEM Ref P.N.'s; 0634906, 9370.634906, 9370.643906	D20LL-8-20	3790005724	2.00	1.25	20.00
Body Raise / Dump OEM Ref P.N.'s; 0642852, 1148536, 9170.642852, 9770.640888	S53DB-22-63	3771513182	Telescopic		63.00

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McNeilus (MTM) MLS Manual Side Loader

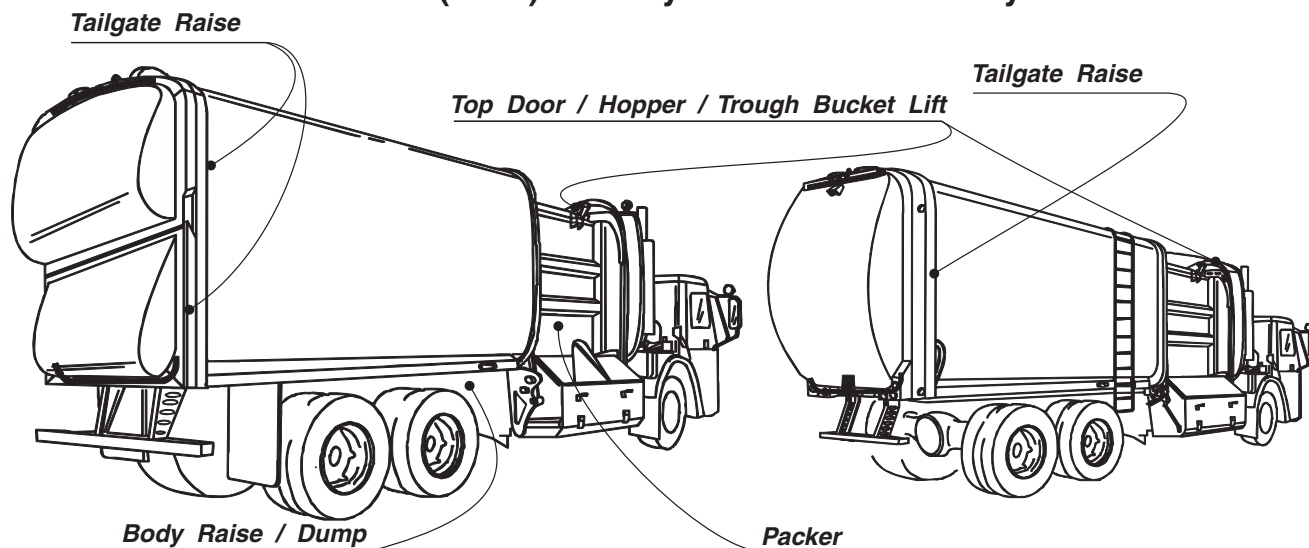
3607, 3630, 3930, MSL



<u>Cylinder Function</u>	<u>Parker Eng#</u>	<u>Parker Number</u>	<u>Bore</u>	<u>Rod</u>	<u>Stroke</u>
Packer Blade OEM Ref P.N.'s; 0635876, 1000094, 9270.635876, 9470.615860, 9470.630861	D50DD-28-39.50	3777921096	5.00	4.00	39.50
Packer Blade OEM Ref P.N.'s; 1104922	D50DD-21-39.50	3777921061	5.00	4.00	39.50
Packer Blade OEM Ref P.N.'s; 9270.615861, 9430.615861	C4543	3790004543	5.00	3.50	34.00
Packer Blade OEM Ref P.N.'s; 0663500, 1100104, 9270.663500	B6314	3790006314	5.00	4.00	39.50
Packer Blade OEM Ref P.N.'s; 1108220, 1145649	B6622	3790006622	4.00	3.00	39.50
Holding Panel, Crusher Panel OEM Ref P.N.'s; 0615860, 1000092, 1145280, 9170.615860, 9270.615860	C4539	3790004539	3.00	2.00	14.00
Tailgate Raise OEM Ref P.N.'s; 0637010, 1100105, 1144707, 9370.637010	D25LL-20-38	3772621153	2.50	1.50	38.00
Tailgate Raise OEM Ref P.N.'s; 0604125, 9272.604125, 9370.604125	D30LL-11-31	3790004133	3.00	2.00	31.00
Tailgate Raise OEM Ref P.N.'s; 0619882, 1000067, 1144703, 9272.604127, 9370.604127, 9370.619882	D32LL-11-38	3770721137	3.00	2.00	38.00
Body Raise / Dump OEM Ref P.N.'s; 0615862, 1148535, 9270.615862, 9770.615862	S64DB-10-73	3771414053	Telescopic		73.00
Body Raise / Dump, Optional Front Mount OEM Ref P.N.'s; 1108392	S53MC-38-166	3771513154	Telescopic		166.00
Body Raise / Dump, Optional Front Mount OEM Ref P.N.'s; 1143954	N/A	N/A	Telescopic		170.00

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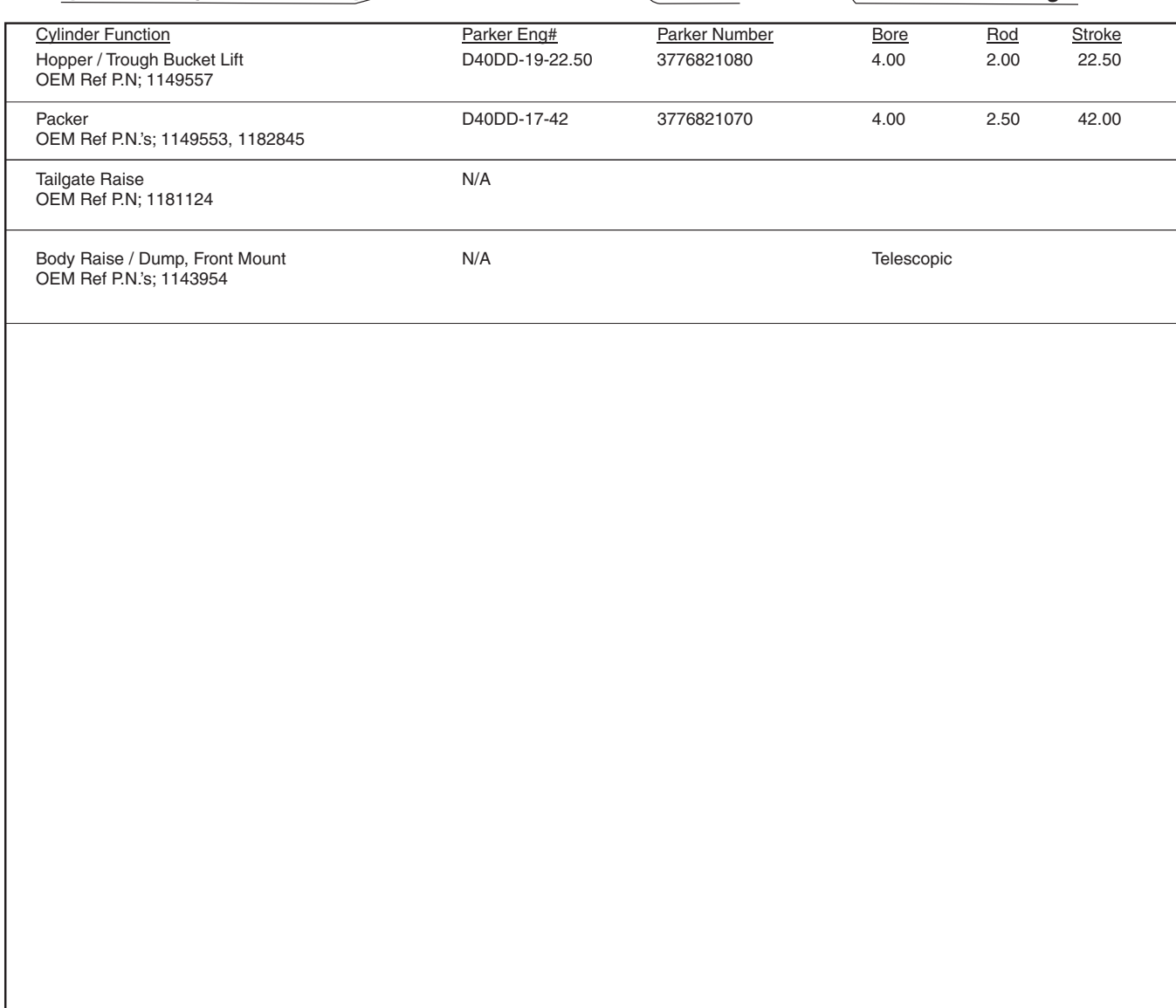
McNeilus (MTM) Century Bucket Loader Recycler



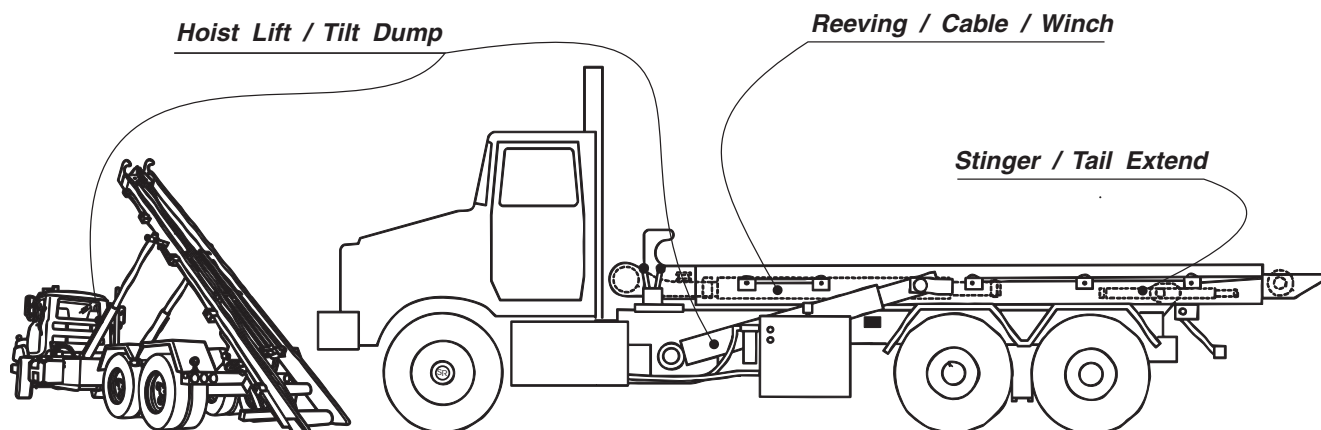
<u>Cylinder Function</u>	<u>Parker Eng#</u>	<u>Parker Number</u>	<u>Bore</u>	<u>Rod</u>	<u>Stroke</u>
Top Door / Hopper / Trough Bucket Lift OEM Ref P.N.'s; 0637007, 9170.637007	D30CD-11-21.25	3770521104	3.00	1.75	21.25
Top Door / Hopper / Trough Bucket Lift OEM Ref P.N.'s; 0633849, 1100045, 9070.633849	B6310	3790006310	3.00	1.75	20.75
Top Door / Hopper / Trough Bucket Lift OEM Ref P.N.'s; 0637507, 9170.637507	B5959	3790005959	3.00	1.75	19.00
Packer OEM Ref P.N.'s; 0637008, 1000166, 9470.637008	D50DD-23-52.75	3777921066	5.00	3.00	52.75
Packer OEM Ref P.N.'s; 1000163, 9470.637508	B5956	3790005956	4.00	3.00	46.00
Packer OEM Ref P.N.'s; 0126261, 200.126261	B6273	3790006273	4.50	3.00	28.00
Tailgate Raise, Single OEM Ref P.N.'s; 0637009, 1000161, 9370.637009	D25LL-19-38	3772621150	2.50	1.50	38.00
Tailgate Raise, Single OEM Ref P.N.'s; 0637010, 1100105, 1144707, 9370.637010	D25LL-20-38	3772621153	2.50	1.50	38.00
Tailgate Raise, Single OEM Ref P.N.'s; 0637509, 1000162, 9370.637509	B5955	3790005955	2.50	1.50	37.50
Tailgate Raise, Double Upper OEM Ref P.N.'s; 0126262, 200.126262	B6242	3790006242	2.00	1.25	21.50
Tailgate Raise, Double Lower OEM Ref P.N.'s; 0634906, 9370.634906, 9370.643906	D20LL-8-20	3790005724	2.00	1.25	20.00
Tailgate Latch OEM Ref P.N.'s; 0636375, 9370.636375	B6293	3790006293	2.00	1.00	3.00
Body Raise / Dump OEM Ref P.N.'s; 0642852, 1148536, 9170.642852, 9770.640888	S53DB-22-63	3771513182	Telescopic		63.00
Body Raise / Dump OEM Ref P.N.'s; 0636002, 9270.636002	S74DC-70-84	3772514113	Telescopic		84.00

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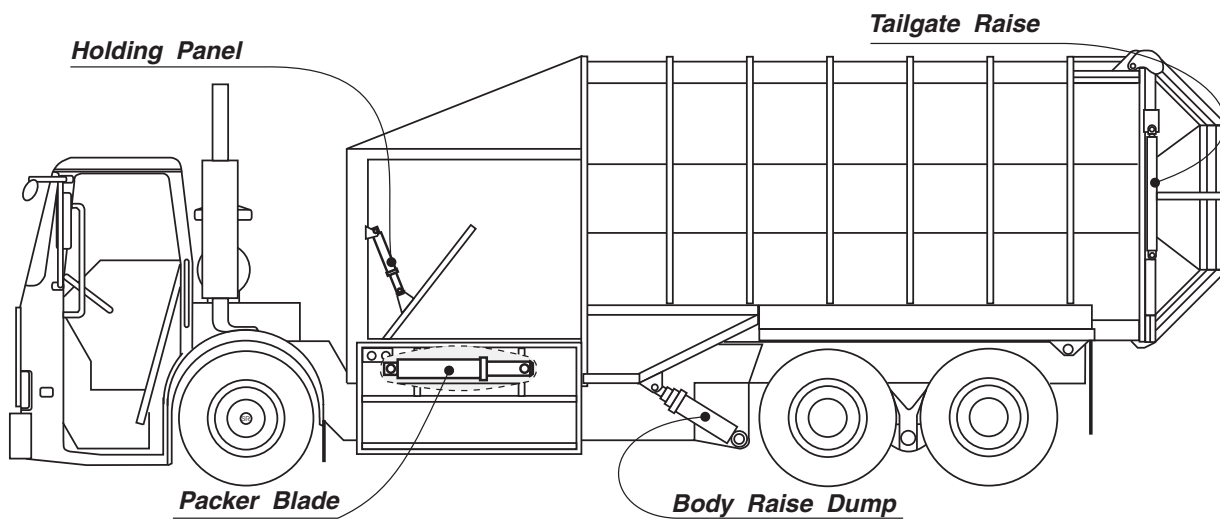


McNeilus (MTM) Roll-Off



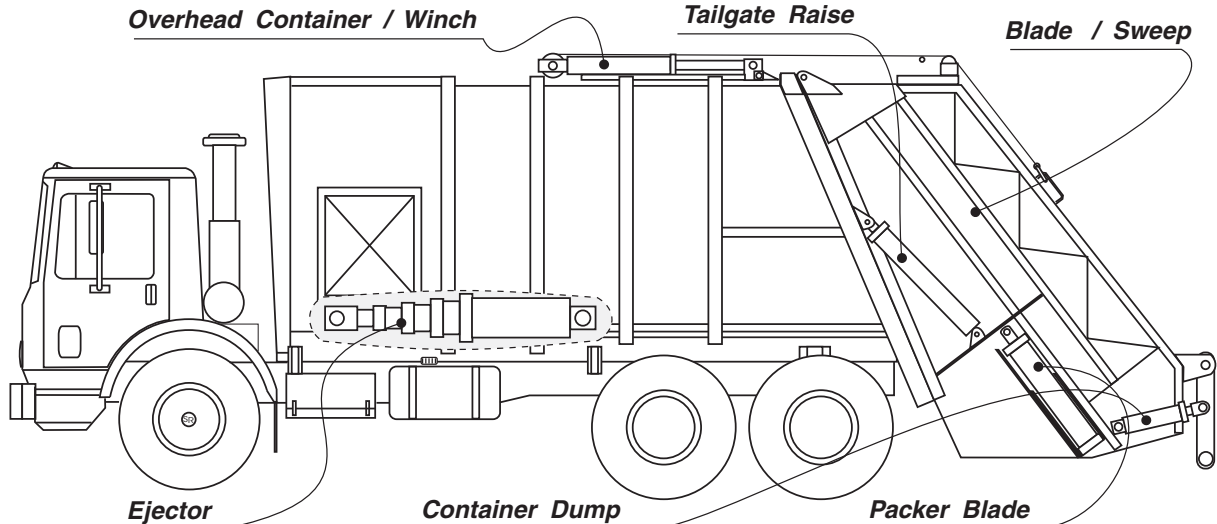
<u>Cylinder Function</u>	<u>Parker Eng#</u>	<u>Parker Number</u>	<u>Bore</u>	<u>Rod</u>	<u>Stroke</u>
Reeving / Cable / Winch; 60,000# OEM Ref P.N.'s; 0651550, 1146285, 1229476, 9070.651550, 9070.654695, 9180.651550	D62LB-5-80	3771421180	6.25	4.75	80.00
Reeving / Cable / Winch; 80,000# OEM Ref P.N.'s; 1148237, 9070.654697, 9180.654697	D72LB-9-80	3772521122	7.25	4.75	80.00
Hoist Lift / Tilt Dump; 60,000# OEM Ref P.N.'s; 0651550, 1146285, 1229476, 9070.651550, 9070.654695, 9180.651550	D62LB-5-80	3771421180	6.25	4.75	80.00
Hoist Lift / Tilt Dump;; 80,000# OEM Ref P.N.'s; 1148237, 9070.654697, 9180.654697	D72LB-9-80	3772521122	7.25	4.75	80.00
Stinger Tail Extend OEM Ref P.N.'s; 0654696, 9070.654696, 9070.654698	B6071	3790006071	3.50	2.50	80.00
Stinger Tail Extend OEM Ref P.N.'s; 9070.654699	B5487	3790005487	3.50	2.50	48.00

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<u>Cylinder Function</u>	<u>Parker Eng#</u>	<u>Parker Number</u>	<u>Bore</u>	<u>Rod</u>	<u>Stroke</u>
Packer Blade, SL-108 & SL-109 OEM Ref P.N.'s; 202104, 800000, 801374	C3831	3790003831	4.00	2.50	29.00
Packer Blade, SL-209 OEM Ref P.N.'s; 040955	N/A		6.00	3.75	31.00
Holding Panel, Crusher Panel, SL-108 & SL-109 OEM Ref P.N.'s; 202105, 207985	N/A		3.50	1.50	16.00
Tailgate Raise, SL-108 & SL-109 OEM Ref P.N.'s; 222741	N/A		2.50		36.00
Tailgate Raise, SL-209 OEM Ref P.N.'s; 404800	C3820	3790003820	3.00	1.75	36.00
Body Raise / Dump 63" Stroke OEM Ref P.N.'s; 401216	S53DB-22-63	3771513182	Telescopic		63.00
Body Raise / Dump 78" Stroke OEM Ref P.N.'s; 222530	N/A	Telescopic			78.00

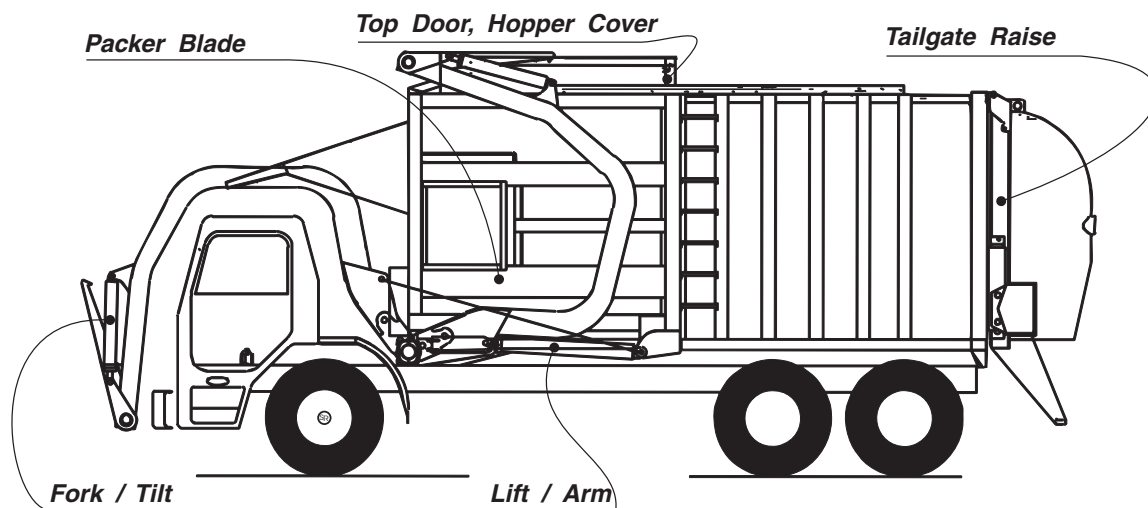
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<u>Cylinder Function</u>	<u>Parker Eng#</u>	<u>Parker Number</u>	<u>Bore</u>	<u>Rod</u>	<u>Stroke</u>
Packer Blade, R200 Series OEM Ref P.N.'s; 4148023	D50DL-2-42	3777921060	5.00	2.50	42.00
Packer Blade, R300 Series OEM Ref P.N.'s; 4148037	D60CL-2-40	3771421221	6.00	3.00	40.00
Blade / Sweep, R200 Series OEM Ref P.N.'s; 4148022	D50DB-13-24	3777921059	5.00	2.50	24.00
Blade / Sweep, R300 Series OEM Ref P.N.'s; 4148000	D60CB-5-26	3771421220	6.00	3.00	26.0024.00
Tailgate Raise, R200 Series OEM Ref P.N.'s; 4149065	D35LL-9-30	3773821058	3.50	2.50	29.81
Tailgate Raise, R300 Series OEM Ref P.N.'s; 4149067	D35LL-9-38	3773821059	3.50	2.50	37.81
Overhead Container Winch Reeving OEM Ref P.N.'s; 4148044	D60CB-5-47	3771421217	6.00	3.00	47.00
Ejector Push Out, 20 YD R200 & R300 Series OEM Ref P.N.'s; 4149043	N/A		5.00	3.00	78.00
Ejector Push Out, 25 YD R200 & R300 Series OEM Ref P.N.'s; 080121, 2000102, 2001125	SD52DC-13-119	3771532071	Telescopic		119.00
Ejector Push Out, 30 YD R200 & R300 Series OEM Ref P.N.'s; 2001102, 2001126	SD52DC-13-140	3771532072	Telescopic		140.00

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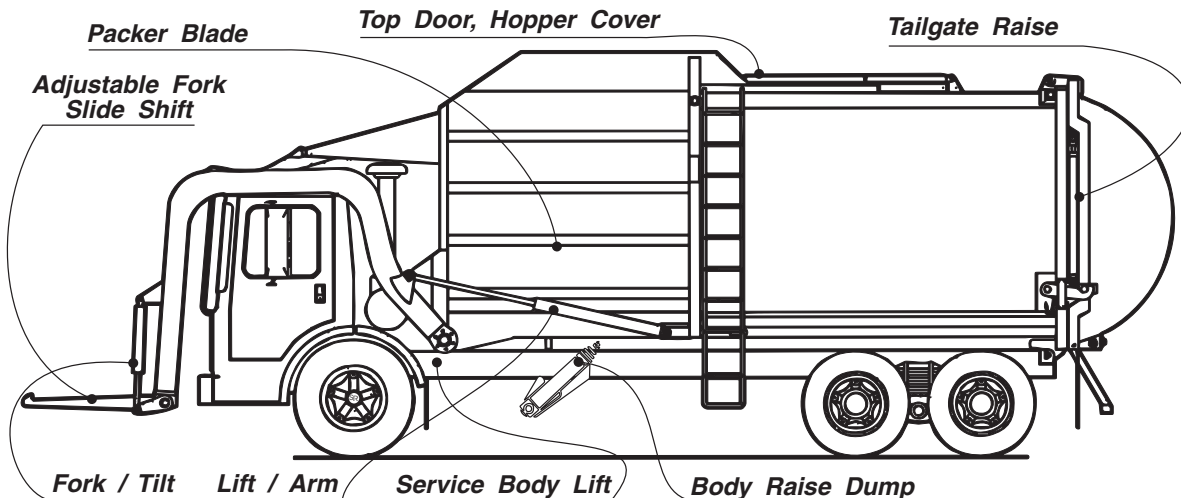
Pak-Mor FPE800 Front Loader



<u>Cylinder Function</u>	<u>Parker Eng#</u>	<u>Parker Number</u>	<u>Bore</u>	<u>Rod</u>	<u>Stroke</u>
Arm / Lift OEM Ref P.N.'s; 4149004	D50CD-3-43.12	3777921062	5.00	2.00	43.13
Fork / Tilt OEM Ref P.N.'s; 4149071	D40CD-12-28	3776821075	4.00	2.00	28.00
Top Door, Sliding OEM Ref P.N.'s; 4149131	D25LL-13-90	3772621130	2.50	1.50	90.00
Tailgate Raise OEM Ref P.N.'s; 4149073	D30LL-7-26.50	3770521094	3.00	1.50	26.50
Packer Blade OEM Ref P.N.'s; 2001183	SD53CC-42-189	3771933017	Telescopic		189.00

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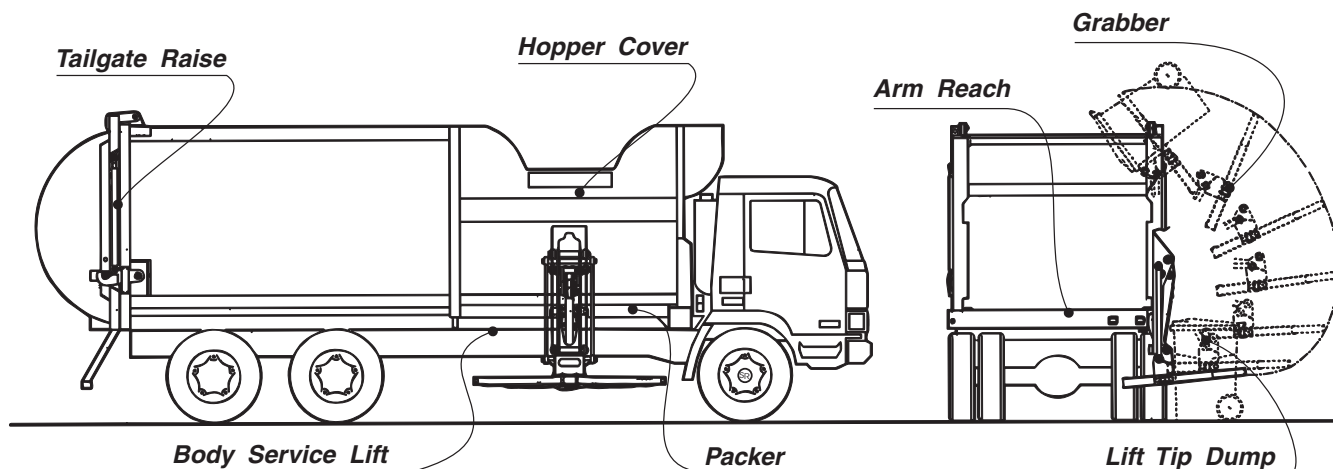
Wittke Starlight Front Loader Commercial and Residential Applications



<u>Cylinder Function</u>	<u>Parker Eng#</u>	<u>Parker Number</u>	<u>Bore</u>	<u>Rod</u>	<u>Stroke</u>
Arm / Lift, 4.00" Bore OEM Ref P.N.'s; FLHC-26B, 016-9900	D40CL-13-45.38	3776821120	4.00	2.00	45.38
Arm / Lift, 4.50" Bore OEM Ref P.N.'s; FLHC-28C, FLHC-26C, 018-9900	D45LD-7-45.38	3774121032	4.50	2.00	45.38
Fork / Tilt OEM Ref P.N.'s; FLHC-27, 014-9900	D35LD-5-19	3773821057	3.50	1.75	19.00
Adjustable Fork / Slide Shift OEM Ref P.N.'s; FLHC-37, 008-9818	N/A		2.00	1.00	13.75
Top Door OEM Ref P.N.'s; FLHC-34, 010-9902	D25LL-15-84	3772621133	2.50	1.50	84.00
Tailgate Raise, Standard Profile OEM Ref P.N.'s; FLHC-25, 010-9901	D25LL-14-42	3772621131	2.50	1.75	42.00
Tailgate Raise, Low Profile OEM Ref P.N.'s; FLHC-29, 010-9900, 110121-2	D25LL-9-36	3772621124	2.50	1.75	36.00
Packer Blade, 38 Yd OEM Ref P.N.'s; FLHC-07, FLHC-18, FLHC-30, FL7-A125W, 095-6024	SD53CD-3-156.88	3771933019	Telescopic		156.88
Packer Blade, 40 Yd OEM Ref P.N.'s; FLHC-08, FLHC-19, FLHC-31, FL7-A117W, 095-6029	SD53CD-3-168	3771933012	Telescopic		168.00
Packer Blade, 44 Yd & 40 Yd Low Profile OEM Ref P.N.'s; FLHC-20, FLHC-32, FL7-A118W, 095-6038	SD53CD-3-185.75	3771533089	Telescopic		185.75
Packer Blade, Tip to Dump OEM Ref P.N.'s; FLHC-02, 022-9000	B5545	3790005545	5.50	3.50	61.50
Body Raise Dump, Gravity Dump OEM Ref P.N.'s; FLHC-06, FLHC-36, 095-1053	S53DB-25-72	3771513188	Telescopic		72.00
Service Body Lift OEM Ref P.N.'s; 100-14-1610, FLHC-42	D30DD-16-16.00	3770521118	3.00	1.25	16.00

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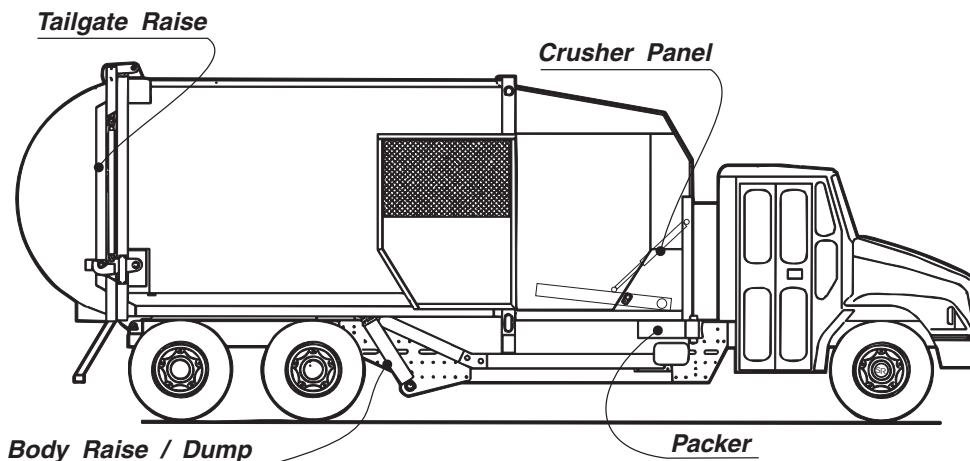
Wittke ASL Automated Side Loader



<u>Cylinder Function</u>	<u>Parker Eng#</u>	<u>Parker Number</u>	<u>Bore</u>	<u>Rod</u>	<u>Stroke</u>
Grabber OEM Ref P.N.: AUHC-07	D20CC-6-4	3770121131	2.00	1.25	4.00
Grabber, With Cat Control System OEM Ref P.N.: AL7-A019	N/A				
Arm Reach OEM Ref P.N.: AUHC-04	D15DD-3-66	3776921019	1.50	1.00	66.00
Arm Lift, Tip Dump OEM Ref P.N.: AUHC-09	D30DC-2-17.38	3770521097	3.00	1.50	17.38
Arm Lift, Tip Dump, With Cat Control System OEM Ref P.N.: H10-0273, AL7-A017	D30DC-3-17.38	3770521136	3.00	1.50	17.38
Packer / Ejector, 36 Yard OEM Ref P.N.'s: FLHC-32, FLHC-20, FL7-A118W, 095-6038	SD53CD-3-185.75	3771533089	Telescopic		185.75
Packer / Ejector, 32 Yard OEM Ref P.N.'s: FLHC-31, FLHC-19, FLHC-08 FL7-A117W, 095-6029	SD53CD-3-168	3771933012	Telescopic		168.00
Packer / Ejector, 26 Yard OEM Ref P.N.'s: FLHC-30, FLHC-18, FLHC-07, FL7-A125W, 095-6024	SD53CD-3-156		Telescopic		156.00
Packer Blade, Tip to Dump OEM Ref P.N.: AUHC-08	D50CC-21-18.50	3777921063	5.00	3.50	18.50
Body Raise Dump, Gravity Dump OEM Ref P.N.'s: FLHC-06, FLHC-36, 095-1053	S53DB-25-72	3771513188	Telescopic		72.00
Hopper Cover OEM Ref P.N.: AUHC-06	D20DD-7-12.00	3770121137	2.50	1.25	20.00
Tailgate Raise, Standard Profile OEM Ref P.N.'s: FLHC-25, 010-9901	D25LL-14-42	3772621131	2.50	1.75	42.00
Tailgate Raise, Low Profile OEM Ref P.N.'s: FLHC-29	D25LL-9-36	3772621124	2.50	1.75	36.00
Body Service Lift OEM Ref P.N.'s: 100-14-1610	D30DD-16-16.00	3770521118	3.00	1.25	16.00
Side Latch, Air Cylinder OEM Ref P.N.: AL4-A020	N/A				

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Wittke Express Manual Side Loader



<u>Cylinder Function</u>	<u>Parker Eng#</u>	<u>Parker Number</u>	<u>Bore</u>	<u>Rod</u>	<u>Stroke</u>
Packer OEM Ref P.N.'s; 020-9900, MLHC-02	D50DD-25-40	3777921079	5.00	3.00	40.00
Crusher Panel OEM Ref P.N.'s; 012-9501, 012-9900, MLHC-01	N/A		3.00	1.50	18.00
Tailgate Raise, Standard Profile OEM Ref P.N.'s; FLHC-25, 010-9901	D25LL-14-42	3772621131	2.50	1.75	42.00
Tailgate Raise, Low Profile OEM Ref P.N.'s; FLHC-29, 010-9900, 110121-2	D25LL-9-36	3772621124	2.50	1.75	36.00
Body Raise / Dump OEM Ref P.N.'s; FLHC-06, FLHC-36, 095-1053,	S53DB-25-72	3771513188	Telescopic		72.00

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Accurate

22003718.....	D40DD-24-31.50.....	3776821128
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A-18.....	D62CC-36-68.....	3770921069
A-19.....	D52CB-31-6.....	3771521140
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110-510.....	D72CC-53-80.88.....	3772521134
110-520.....	D72CC-54-80.....	3772521142
110-710.....	D72CB-11-60.....	3772521065
110-730.....	D30LL-6-36.....	3773221005
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B611.....	D62CB-18-78.....	3771421098

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AB17924.....	SD63CC-11-96.....	3771433044
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DB9467.....	D40DD-19-22.50.....	3776821080
HSTSP-10SR	D4432	3790004432
SP42-48.....	C4193	3790004193

Fanotech

99-01015	SD63CB-26-167	3771433925
99-40007	SD74CC-16-163	3772534053
99-40008	SD63CC-38-124	3771433113

Emco Rand

81-040	SD62MC-11-210	3771432042
81-054	SD62MC-11-171	3771432040
81-070	SD62MC-12-171	3771432044
81-071	SD62MC-12-234	3771432047
81-072	SD62MC-12-210	3771432046
81-073	SD62MC-12-186	3771432045
81-075	SD62MC-12-171	3771432044
81-076	SD62MC-12-234	3771432047
81-078	SD62MC-12-186	3771432045
81-079	SD62MC-12-210	3771432046
81-089	SD62MC-12-171	3771432044
81-091	SD62MC-12-210	3771432046

Emco Rand

81-092	SD62MC-12-234	3771432047
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104176ADA	SD94CC-7-176	3778634004
20-04001	3782000014	3782000014
20-35489	SD94CC-7-176	3778634004
20-35522	C3862	3790003862
20-35883	D30DD-7-21.12	3770521057
20-35908	D40DL-2-30.38	3776821029
20-36259	D4107	3790004107
20-36393	D40DD-10-21.62	3776821019
20-39032	SD94CC-7-176	3778634004
20-39762	C3864	3790003864
20-41381	D40CB-10-42	3776821106
20-41382	C3915	3790003915
20-42616	SD94CC-7-176	3778634004
20-43726	D40DB-7-28.5	3776821123
20-43727	D40DB-7-28.5	3776821123
20-44095	D60DC-12-42.62.....	3771421240
20-44125	D40LB-2-35.31.....	3776821105
20-44969	D40DB-7-28.5	3776821123
20-44973	D60DC-12-42.62.....	3771421240
20-45169	D40LB-2-35.31.....	3776821105
20-45176	C3864	3790003864
20-45450	D60DB-16-67.5	3771421181
20-46008	D25DD-5-63	3772621138
20-46012	D35LD-6-16.50	3774021019
20-46076	D40DB-7-28.5	3776821123
20-46077	D60DC-12-42.62.....	3771421240
20-46119	D45CD-5-49.12	3774121048
20-46132	C3864	3790003864
20-46133	C3871	3790003871
20-46134	C3862	3790003862
20-46138	C3861	3790003861
20-46139	D60DB-16-67.5	3771421181
20-46141	D25DD-5-63	3772621138
20-46142	D35LD-6-16.50	3774021019
20-46151	D30DD-7-21.12	3770521057
20-46152	D35DL-2-26.31	3774021006
20-46153	D40DL-2-30.38	3776821029
20-46154	D4054	3790004054
20-46155	D40DD-10-21.62.....	3776821019
20-46156	D4107	3790004107
20-46157	C3915	3790003915
20-46159	D40CB-10-42	3776821106
20-46163	D45CD-5-49.12	3774121048
20-46171	D45CD-5-49.12	3774121048
20-46249	D40LB-2-35.31.....	3776821105
20-46332	D60DC-8-60	3771421161
20-46372	D40DB-7-28.5	3776821123
20-46448	B4789	3790004789
20-46482	B4789	3790004789
20-47048	D30LD-8-33.38	3770521123
20-47088	D40CB-10-42	3776821106
20-47090	D40LB-2-35.31.....	3776821105
20-47091	D40DB-7-28.5	3776821123
20-47092	D60DC-12-42.62.....	3771421240
20-47491	D30DD-7-21.12	3770521057
20-47492	D40DL-2-30.38	3776821029
20-47868	D35LD-3-23.25	3774021004
20-48279	D60DC-12-42.62.....	3771421240
20-48496	SD94CC-7-176	3778634004
20-48519	D55CC-12-49.12.....	3771921050
20-48520	D30DD-15-89	3770521116
20-48524	D40LD-2-16.5	3776821020
20-48858	D35DB-2-14.25	3774021007
20-49142	D60DB-16-67.5	3771421181
20-49271	D35LD-6-16.50	3774021019
20-49272	D35LD-3-23.25	3774021004

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20-49273	D45CD-5-49.12	3774121048
20-49276	D35LD-6-16.50	3774021019
20-49277	D45CD-5-49.12	3774121048
20-49278	D35LD-3-23.25	3774021004
20-49348	D30DD-9-23	3770521067
20-49480	D60DB-16-67.5	3771421181
20-49774	D55CC-2-38.31	3771921030
20-49775	D40CC-16-24.81	3776821024
20-49897	D40DB-7-28.5	3776821123
20-49898	D60DC-12-42.62	3771421240
20-49952	D35LD-6-16.50	3774021019
20-49999	D35LD-6-16.50	3774021019
20-50000	D35LD-3-23.25	3774021004
20-52030	D4354	3790004354
20-52031	D4353	3790004353
20-52344	D45CD-5-49.12	3774121048
20-52345	D35LD-6-16.50	3774021019
20-52346	D35LD-3-23.25	3774021004
20-52347	D30LD-8-33.38	3770521123
20-52348	D30DD-15-89	3770521116
20-52349	D60DB-16-67.5	3771421181
20-52355	D55CC-12-49.12	3771921050
20-52356	D40LD-2-16.5	3776821020
20-52357	D40DD-10-21.62	3776821019
20-52362	D25DD-5-63	3772621138
21-01365	SD62CC-23-70	3771432062
21-01366	SD62CC-23-81	3771432061
21-01367	SD62CC-23-92	3771432060
21-01368	SD63CC-28-124	3771433072
21-01369	SD74CC-13-162.88	3772534042
21-01370	SD62CC-24-82.5	3771432064
21-01371	SD62CC-24-96.5	3771432063
21-01372	SD63CC-27-129	3771433074
21-01374	SD74CC-15-167.50	3772534049
21-01375	SD52CC-25-68.5	3771532053
21-01376	SD52CC-25-82.5	3771532054
21-01377	SD52CC-25-96.5	3771532052
21-01378	SD53CC-30-129	3771533066
21-01379	SD42CC-22-57	3771032027
21-01381	SD52CC-25-92.5	3771532055
21-01382	SD53CC-30-117.25	3771533057
21-01438	S63DC-54-79.31	3771413158
21-01492	S53DC-18-64.75	3771513098
21-01530	D60DC-12-42.62	3771421240
21-01531	D40DB-7-28.5	3776821123
21-01532	D40LB-2-35.31	3776821105
21-01549	D30DL-1-18.5	3770521052
21-01629	S31LC-1-28.56	3770711027
21-01630	D30DD-7-21.12	3770521057
21-01631	D40DL-2-30.38	3776821029
21-01632	S31CC-24-23.56	3770711028
21-01633	SD53CC-29-91.50	3771533056
21-01634	D30DD-6-18	3770521051
21-01635	D35DL-2-26.31	3774021006
21-01636	SD42CB-X-58 9502-06	3771032026
21-01644	S52DB-7-53.62	3771512052
21-01646	S31LC-2-27.5	3770711030
21-01647	D35CD-6-24.81	3773821031
21-01648	D45CC-3-38.31	3775221022
21-01765	SD63CC-27-129	3771433074
21-01819	S53DB-24-82	3771513185
21-01883	D40CC-16-24.81	3776821024
21-01947	D30LC-2-31.5	3770521105
21-01954	D55CC-2-38.31	3771921030
21-01987	SD63CB-26-197	3771433931
21-02112	S53DB-24-92	3771513186
21-02113	S53DB-24-71	3771513184
21-02220	D40DB-7-25.62	3776821122
21-02610	D40DB-7-25.62	3776821122

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21-02804	D30DL-2-15.375	3770521054
21-02830	D60DC-8-60	3771421161
21-02832	D40CB-10-42	3776821106
21-02833	D35DB-2-14.25	3774021007
21-03153	D40LD-10-24.75	3776821110
21-03228	D50CB-3-42	3777921005
21-03390	D45LD-6-24	3774121017
21-03471	D35DL-2-26.31	3774021006
21-03472	D40DL-2-30.38	3776821029
21-03854	SD52CB-6-132.75	3771532057
21-03855	D35CD-7-51.31	3774021009
21-03856	D30CD-7-24.75	3770521058
21-03857	D25DD-4-24	3772621097
21-04001	3782000014	3782000014
21-04321	D30CC-8-10.88	3770521061
21-04322	D30CC-7-4.19	3770521060
21-04323	D50CC-14-14.81	3777921006
21-04324	D30CC-9-12.56	3770521062
21-04325	D30CC-9-12.06	3770521063
21-04326	D30CC-9-9.50	3770521064
21-04327	D30CC-9-8.38	3770521065
21-04533	D30DD-9-23	3770521067
21-04536	SD63CB-26-132.75	3771433930
21-04537	SD63CB-26-167	3771433925
21-04538	SD63CB-26-197	3771433931
21-04920	SD62CC-25-132	3771432068
21-04945	D30DD-9-23	3770521067
21-05358	D45CD-4-49.12	3774121047
21-05843	D25DD-5-89	3772621137
21-06096	SD63CB-27-167	3771433935
21-06097	SD63CB-27-195	3771433936
21-06343	D45CD-4-51.31	3774121050
21-06957	B5607	3790005607
21-07434	D30LD-4-24	3770521071
21-07940	D60DB-16-67.5	3771421181
21-09213	D40LD-12-21.75	3776821117
21-09214	D45LD-8-21.75	3774121051
21-09228	D40LD-11-24.75	3776821112
21-09229	D45LD-6-24	3774121017
21-10044	D40LD-6-24.75	3776821044
21-10344	SD62CC-27-133	3771432074
21-10661	D50CB-6-40	3777921038
21-11441	SD52CB-10-132.19	3771532073
21-11903	S64DC-11-99	3771414048
21-11904	S53DC-21-81	3771513143
21-11905	S53DC-21-65	3771513142
21-12474	D60DB-16-67.5	3771421181
21-12475	D60DB-18-67	3771421184
21-12851	D55CC-12-49.12	3771921050
21-14634	D40CC-16-24.81	3776821024
21-14635	D55CC-2-38.31	3771921030
21-14636	D30LC-2-31.5	3770521105
21-14638	SD62CC-24-96.5	3771432063
21-14639	SD63CC-27-129	3771433074
21-14643	SD74CC-15-167.50	3772534049
21-14653	D45CC-3-38.31	3775221022
21-14654	SD52CC-25-68.5	3771532053
21-14655	SD52CC-25-82.5	3771532054
21-14656	SD52CC-25-96.5	3771532052
21-14657	SD53CC-30-129	3771533066
21-14658	D40DB-7-28.5	3776821123
21-14659	D60DC-12-42.62	3771421240
21-14660	D40LB-2-35.31	3776821105
21-14661	D40DB-7-25.62	3776821122
21-14662	SD74CC-13-162.88	3772534042
21-14663	SD63CC-28-124	3771433072
21-14664	SD62CC-23-92	3771432060
21-14665	SD62CC-23-81	3771432061
21-14667	D60DC-8-60	3771421161

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21-14668	D30DL-2-15.375	3770521054
21-14670	D30DD-7-21.12	3770521057
21-14671	D40DL-2-30.38	3776821029
21-14672	S31LC-1-28.56	3770711027
21-14673	SD53CC-30-117.25	3771533057
21-14674	SD42CC-22-57	3771032027
21-14675	D30DD-6-18	3770521051
21-14676	D35DL-2-26.31	3774021006
21-14677	S31CC-24-23.56	3770711028
21-14678	SD53CC-29-91.50	3771533056
21-14679	D40LD-6-24.75	3776821044
21-14767	SD63CB-13-146	3771433920
21-14769	SD63CB-13-180	3771433919
21-14770	SD63CB-13-180	3771433919
21-14771	SD63CB-13-180	3771433919
21-14773	D56CC-2-67.50	3775921010
21-14783	D56CC-2-67.50	3775921010
21-15639	D55CC-12-49.12	3771921050
21-15640	D45LD-6-24	3774121017
21-15641	D45CD-4-49.12	3774121047
21-15642	D40LD-11-24.75	3776821112
21-15643	D35CD-7-51.31	3774021009
21-15644	D30LD-8-33.38	3770521123
21-15645	D45CD-4-51.31	3774121050
21-15646	D30DD-15-89	3770521116
21-15647	D30DD-9-23	3770521067
21-15648	D50CB-3-42	3777921005
21-15649	S53DC-21-81	3771513143
21-15770	SD63CB-26-167	3771433925
21-15771	SD63CB-27-167	3771433935
21-15772	SD63CB-26-197	3771433931
21-15773	SD63CB-26-132.75	3771433930
21-15774	D45LD-8-21.75	3774121051
21-15775	D40LD-12-21.75	3776821117
21-15777	SD52CB-10-132.19	3771532073
21-15953	SD63CB-13-146	3771433920
21-16048	SD52CB-6-132.75	3771532057
2534DAA	C3915	3790003915
2563ADA	D25DD-5-63	3772621138
30-00147	S63DC-61-92	3771413159
3021CDA	D30DD-7-21.12	3770521057
3021GDA	D30DD-7-21.12	3770521057
3024CDA	3782000014	3782000014
31-00085	D35BC-1-39	3777121002
31-00086	D25BD-1-24	3770121100
31-00118	D25BD-1-40.5	3770121099
31-00119	D40CC-18-48	3775621004
3516BDA	D35LD-6-16.50	3774021019
3526EDA	C3864	3790003864
3526GDA	C3864	3790003864
4021EDA	D40DD-10-21.62	3776821019
4028BDA	D40DB-7-28.5	3776821123
4028CDA	D40DB-7-28.5	3776821123
4028DA	D40DB-7-28.5	3776821123
4030DA	D40DL-2-30.38	3776821029
4030EDA	D40DL-2-30.38	3776821029
4035CDA	D40LB-2-35.31	3776821105
4035EDA	D40LB-2-35.31	3776821105
4522EDA	C3862	3790003862
4526BDA	C3871	3790003871
4548BDA	C3861	3790003861
4549DA	D45CD-5-49.12	3774121048
5292DA	SD52CC-25-92.5	3771532055
53117DA	SD53CC-30-117.25	3771533057
5381B	S53DC-70-80.75	3771513187
5532ADA	D4107	3790004107
5532CDA	D4107	3790004107
5532EDA	D4107	3790004107
6042ADA	D60DC-12-42.62	3771421240

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6042DA	D60DC-12-42.62	3771421240
6067DA	D60DB-16-67.5	3771421181
6282DA	SD62CC-20-82	3771432054
6292BDA	SD62CC-23-92	3771432060
6292DA	SD62CC-22-92	3771432058
63124BDA	SD63CC-28-124	3771433072
63124DA	SD63CC-28-124	3771433072
63124DDA	SD63CC-28-124	3771433072
6380	S63DC-54-79.31	3771413158
70-1010	SD85CC-20-156	3773035033
70-1032	SD62CC-20-82	3771432054
70-1114	S63DC-54-79.31	3771413158
70-1235	SD85CC-20-156	3773035033
70-1251	SD85CC-19-378	3772935027
70-1259	S53DC-70-80.75	3771513187
70-1275	SD42CB-X-58 9502-06	3771032026
70-1276	SD53CC-29-91.50	3771533056
70-1308	SD52CC-25-92.5	3771532055
70-1309	SD53CC-30-117.25	3771533057
70-1420	SD94CC-7-176	3778634004
70-1422	SD74CC-13-162.88	3772534042
70-1464	SD62CC-23-92	3771432060
70-1465	SD63CC-28-124	3771433072
70-1478	SD63CC-28-124	3771433072
70-1487	S53DC-70-80.75	3771513187
70-1488	S63DC-54-79.31	3771413158
70-1499	S53DB-24-82	3771513185
70-1503	SD94CC-7-176	3778634004
70-1504	SD53CC-29-91.50	3771533056
70-1506	SD52CC-25-92.5	3771532055
70-1507	SD62CC-23-92	3771432060
70-1508	SD74CC-13-162.88	3772534042
70-1510	SD85CC-19-378	3772935027
70-1511	SD62CC-20-82	3771432054
70-1521	SD42CB-X-58 9502-06	3771032026
70-1546	SD74CC-13-162.88	3772534042
70-1547	SD62CC-23-92	3771432060
70-1548	SD63CC-28-124	3771433072
70-1549	SD85CC-19-378	3772935027
70-1566	SD52CC-25-92.5	3771532055
70-1567	S31LC-1-28.56	3770711027
70-1574	SD94CC-7-176	3778634004
70-1575	SD94CC-7-176	3778634004
70-1577	SD53CC-30-117.25	3771533057
70-1579	SD62CC-23-70	3771432062
70-1581	SD42CC-22-57	3771032027
70-1592	SD63CB-26-167	3771433925
70-1595	S31LC-2-27.5	3770711030
70-1598	SD52CC-25-96.5	3771532052
70-1599	SD53CC-30-129	3771533066
70-1600	SD52CC-25-82.5	3771532054
70-1601	SD63CB-26-132.75	3771433930
70-1602	SD52CC-25-92.5	3771532055
70-1612	SD52CC-25-68.5	3771532053
70-1616	SD63CC-28-124	3771433072
70-1617	SD62CC-23-81	3771432061
70-1618	SD62CC-23-92	3771432060
70-1619	SD63CB-26-167	3771433925
70-1621	SD52CC-25-92.5	3771532055
70-1622	SD52CC-25-96.5	3771532052
70-1623	SD42CB-X-58 9502-06	3771032026
70-1625	SD42CC-22-57	3771032027
70-1626	SD53CC-30-117.25	3771533057
70-1627	SD63CB-26-132.75	3771433930
70-1631	SD74CC-13-162.88	3772534042
70-1632	SD85CC-19-378	3772935027
70-1639	SD53CC-30-129	3771533066
70-1653	S53DC-70-80.75	3771513187
70-1659	S63DC-54-79.31	3771413158

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70-1660	S63DC-61-92	3771413159
70-1670	S53DC-18-64.75	3771513098
70-1674	SD52CC-25-68.5	3771532053
70-1681	SD62CC-24-82.5	3771432064
70-1682	SD62CC-24-96.5	3771432063
70-1683	SD63CC-27-129	3771433074
70-1685	SD74CC-15-167.50	3772534049
70-1687	SD62CC-24-82.5	3771432064
70-1688	SD62CC-24-96.5	3771432063
70-1689	SD63CC-27-129	3771433074
70-1691	SD74CC-15-167.50	3772534049
70-1704	S31LC-1-28.56	3770711027
70-1705	SD53CC-30-129	3771533066
70-1706	SD63CC-27-129	3771433074
70-1720	SD52CC-25-82.5	3771532054
70-1722	S53DB-24-92	3771513186
70-1725	SD74CC-15-167.50	3772534049
70-1726	SD62CC-24-96.5	3771432063
70-1727	SD63CC-28-124	3771433072
70-1730	SD63CB-26-167	3771433925
70-1731	SD63CB-26-132.75	3771433930
70-1732	S53DC-70-80.75	3771513187
7078DA	D4054	3790004054
74162DA	SD74CC-13-162.88	3772534042
85378DA	SD85CC-19-378	3772935027
94176CDA	SD94CC-7-176	3778634004
94176DA	SD94CC-7-176	3778634004
94176HDA	SD94CC-7-176	3778634004
C2523E	S31CC-24-23.56	3770711028
C3015HDA	D30DL-2-15.375	3770521054
C3018HDA	D30DD-6-18	3770521051
C3021MDA	D30DD-7-21.12	3770521057
C3023GDA	D30DD-9-23	3770521067
C3031DDA	D30LC-2-31.5	3770521105
C3033EDA	D30LD-8-33.38	3770521123
C3089BDA	D30DD-15-89	3770521116
C3128G	S31LC-1-28.56	3770711027
C3128K	S31LC-1-28.56	3770711027
C3526PDA	D35DL-2-26.31	3774021006
C3551BDA	D35CD-7-51.31	3774021009
C4022CDA	D40LD-12-21.75	3776821117
C4025MDA	D40CC-16-24.81	3776821024
C4025NDA	D40DB-7-25.62	3776821122
C4025PDA	D40LD-6-24.75	3776821044
C4025RDA	D40LD-11-24.75	3776821112
C4028MDA	D40DB-7-28.5	3776821123
C4030MDA	D40DL-2-30.38	3776821029
C4035MDA	D40LB-2-35.31	3776821105
C4257ADA	SD42CC-22-57	3771032027
C4257CDA	SD42CC-22-57	3771032027
C4522LOA	D45LD-8-21.75	3774121051
C4525BDA	D45LD-6-24	3774121017
C4538DDA	D45CC-3-38.31	3775221022
C4549NDA	D45CD-4-49.12	3774121047
C4551EDA	D45CD-4-51.31	3774121050
C5042BDA	D50CB-3-42	3777921005
C5067EDA	D56CC-2-67.50	3775921010
C52133BDA	SD52CB-10-132.19	3771532073
C52133CDA	SD52CB-6-132.75	3771532057
C5269CDA	SD52CC-25-68.5	3771532053
C5269EDA	SD52CC-25-68.5	3771532053
C5283BDA	SD52CC-25-82.5	3771532054
C5283EDA	SD52CC-25-82.5	3771532054
C5292FDA	SD52CC-25-92.5	3771532055
C5297CDA	SD52CC-25-96.5	3771532052
C5297EDA	SD52CC-25-96.5	3771532052
C53117EDA	SD53CC-30-117.25	3771533057
C53117JDA	SD53CC-30-117.25	3771533057
C53129CDA	SD53CC-30-129	3771533066

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C53129EDA	SD53CC-30-129	3771533066
C5365K	S53DC-18-64.75	3771513098
C5381K	S53DC-70-80.75	3771513187
C5381ZDA	S53DC-21-81	3771513143
C5390A	S53DB-24-92	3771513186
C5391EDA	SD53CC-29-91.50	3771533056
C5538DDA	D55CC-2-38.31	3771921030
C5549CDA	D55CC-12-49.12	3771921050
C6042MDA	D60DC-12-42.62	3771421240
C6060DDA	D60DC-8-60	3771421161
C6281BDA	SD62CC-23-81	3771432061
C6283BDA	SD62CC-24-82.5	3771432064
C6292BDA	SD62CC-23-92	3771432060
C6292HDA	SD62CC-23-92	3771432060
C6292KDA	SD62CC-23-92	3771432060
C6297BDA	SD62CC-24-96.5	3771432063
C6297CDA	SD62CC-24-96.5	3771432063
C6297FDA	SD62CC-24-96.5	3771432063
C63124HDA	SD63CC-28-124	3771433072
C63124JDA	SD63CC-28-124	3771433072
C63124MDA	SD63CC-28-124	3771433072
C63129BDA	SD63CC-27-129	3771433074
C63129CDA	SD63CC-27-129	3771433074
C63133ADA	SD63CB-26-132.75	3771433930
C63133EDA	SD63CB-26-132.75	3771433930
C63167BDA	SD63CB-26-167	3771433925
C63167HDA	SD63CB-26-167	3771433925
C63167JDA	SD63CB-27-167	3771433935
C63198DDA	SD63CB-26-197	3771433931
C6380R	S63DC-54-79.31	3771413158
C6392J	S63DC-61-92	3771413159
C74162DDA	SD74CC-13-162.88	3772534042
C74162EDA	SD74CC-13-162.88	3772534042
C74168BDA	SD74CC-15-167.50	3772534049
C74168DDA	SD74CC-15-167.50	3772534049
C74168FDA	SD74CC-15-167.50	3772534049
C85378DDA	SD85CC-19-378	3772935027
D104176CDA	SD94CC-7-176	3778634004
D104176DDA	SD94CC-7-176	3778634004
D2534CDA	C3915	3790003915
D2534GDA	C3915	3790003915
D2563BDA	D25DD-5-63	3772621138
D30103ADA	B4789	3790004789
D30103BDA	B4789	3790004789
D3021GDA	D30DD-7-21.12	3770521057
D3021HDA	D30DD-7-21.12	3770521057
D3023BDA	D30DD-9-23	3770521067
D3033ADA	D30LD-8-33.38	3770521123
D3089DA	D30DD-15-89	3770521116
D3127A	S31LC-2-27.5	3770711030
D3128D	S31LC-1-28.56	3770711027
D3514CDA	D35DB-2-14.25	3774021007
D3516CDA	D35LD-6-16.50	3774021019
D3516GDA	D35LD-6-16.50	3774021019
D3516JDA	D35LD-6-16.50	3774021019
D3516KDA	D35LD-6-16.50	3774021019
D3523BDA	D35LD-3-23.25	3774021004
D3523DA	D35LD-3-23.25	3774021004
D3526HDA	C3864	3790003864
D3526JDA	D35DL-2-26.31	3774021006
D4016DA	D40LD-2-16.5	3776821020
D4021EDA	D40DD-10-21.62	3776821019
D4021JDA	D40DD-10-21.62	3776821019
D4025ADA	D40CC-16-24.81	3776821024
D4028DDA	D40DB-7-28.5	3776821123
D4028EDA	D40DB-7-28.5	3776821123
D4028FDA	D40DB-7-28.5	3776821123
D4028GDA	D40DB-7-28.5	3776821123
D4028KDA	D40DB-7-28.5	3776821123

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D4030EDA	D40DL-2-30.38	3776821029
D4030FDA	D40DL-2-30.38	3776821029
D4035HDA	D40LB-2-35.31	3776821105
D4035JDA	D40LB-2-35.31	3776821105
D4042BDA	D40CB-10-42	3776821106
D4042CDA	D40CB-10-42	3776821106
D4257DA	SD42CC-22-57	3771032027
D4258BDA	SD42CB-X-58 9502-06	3771032026
D4522JDA	C3862	3790003862
D4526BDA	C3871	3790003871
D4548BDA	C3861	3790003861
D4549ADA	D45CD-5-49.12	3774121048
D4549BDA	D45CD-5-49.12	3774121048
D4549DDA	D45CD-5-49.12	3774121048
D4549EDA	D45CD-5-49.12	3774121048
D5269BDA	SD52CC-25-68.5	3771532053
D5283ADA	SD52CC-25-82.5	3771532054
D5292CDA	SD52CC-25-92.5	3771532055
D5292DDA	SD52CC-25-92.5	3771532055
D5292EDA	SD52CC-25-92.5	3771532055
D5297ADA	SD52CC-25-96.5	3771532052
D53117DDA	SD53CC-30-117.25	3771533057
D53129ADA	SD53CC-30-129	3771533066
D53129BDA	SD53CC-30-129	3771533066
D5381G	S53DC-70-80.75	3771513187
D5382C	S53DB-24-82	3771513185
D5391ADA	SD53CC-29-91.50	3771533056
D5532EDA	D4107	3790004107
D5538ADA	D55CC-2-38.31	3771921030
D5549DA	D55CC-12-49.12	3771921050
D6042BDA	D60DC-12-42.62	3771421240
D6042CDA	D60DC-12-42.62	3771421240
D6042DDA	D60DC-12-42.62	3771421240
D6042HDA	D60DC-12-42.62	3771421240
D6060DA	D60DC-8-60	3771421161
D6067ADA	D60DB-16-67.5	3771421181
D6067BDA	D60DB-16-67.5	3771421181
D6067EDA	D60DB-16-67.5	3771421181
D6270DA	SD62CC-23-70	3771432062
D6281DA	SD62CC-23-81	3771432061
D6282FDA	SD62CC-20-82	3771432054
D6283ADA	SD62CC-24-82.5	3771432064
D6292CDA	SD62CC-23-92	3771432060
D6292EDA	SD62CC-23-92	3771432060
D6297ADA	SD62CC-24-96.5	3771432063
D63124FDA	SD63CC-28-124	3771433072
D63124HDA	SD63CC-28-124	3771433072
D63129ADA	SD63CC-27-129	3771433074
D63133DA	SD63CB-26-132.75	3771433930
D63167DA	SD63CB-26-167	3771433925
D6380L	S63DC-54-79.31	3771413158
D7078ADA	D4054	3790004054
D74162ADA	SD74CC-13-162.88	3772534042
D74162BDA	SD74CC-13-162.88	3772534042
D74168ADA	SD74CC-15-167.50	3772534049
D85378BDA	SD85CC-19-378	3772935027
D85378CDA	SD85CC-19-378	3772935027
H104176ADA	SD94CC-7-176	3778634004
J3516HDA	D35LD-6-16.50	3774021019
J4549FDA	D45CD-5-49.12	3774121048
K2523D	S31CC-24-23.56	3770711028
K2524DA	D25DD-4-24	3772621097
K2563EDA	D25DD-5-63	3772621138
K2589ADA	D25DD-5-89	3772621137
K3004DA	D30CC-7-4.19	3770521060
K3008DA	D30CC-9-8.38	3770521065
K3009DA	D30CC-9-9.50	3770521064
K3011DA	D30CC-8-10.88	3770521061
K3012DA	D30CC-9-12.06	3770521063

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K3013DA	D30CC-9-12.56	3770521062
K3015GDA	D30DL-2-15.375	3770521054
K3018FDA	D30DL-1-18.5	3770521052
K3018GDA	D30DD-6-18	3770521051
K3021LDA	D30DD-7-21.12	3770521057
K3023DDA	D30DD-9-23	3770521067
K3023EDA	D30DD-9-23	3770521067
K3025BDA	D30CD-7-24.75	3770521058
K3025CDA	D30LD-4-24	3770521071
K3031CDA	D30LC-2-31.5	3770521105
K3033DDA	D30LD-8-33.38	3770521123
K3089ADA	D30DD-15-89	3770521116
K3127E	S31LC-2-27.5	3770711030
K3128J	S31LC-1-28.56	3770711027
K3514DDA	D35DB-2-14.25	3774021007
K3516LDA	D35LD-6-16.50	3774021019
K3523FDA	D35LD-3-23.25	3774021004
K3525GDA	D35CD-6-24.81	3773821031
K3526LDA	D35DL-2-26.31	3774021006
K3526NDA	D35DL-2-26.31	3774021006
K3549CDA	D35CD-7-51.31	3774021009
K3551ADA	D35CD-7-51.31	3774021009
K4016FDA	D40LD-2-16.5	3776821020
K4021NDA	D40DD-10-21.62	3776821019
K4022BDA	D40LD-12-21.75	3776821117
K4025EDA	D4354	3790004354
K4025FDA	D40CC-16-24.81	3776821024
K4025GDA	D40DB-7-25.62	3776821122
K4025JDA	D40LD-10-24.75	3776821110
K4025KDA	D40LD-11-24.75	3776821112
K4025LDA	D40LD-6-24.75	3776821044
K4028LDA	D40DB-7-28.5	3776821123
K4030JDA	D40DL-2-30.38	3776821029
K4030LDA	D40DL-2-30.38	3776821029
K4035LDA	D40LB-2-35.31	3776821105
K4042DDA	D40CB-10-42	3776821106
K4257BDA	SD42CC-22-57	3771032027
K4258DDA	SD42CB-X-58 9502-06	3771032026
K4522KDA	D45LD-8-21.75	3774121051
K4525ADA	D45LD-6-24	3774121017
K4525DA	D45LD-6-24	3774121017
K4538FDA	D45CC-3-38.31	3775221022
K4542DA	B5607	3790005607
K4549KDA	D4353	3790004353
K4549LDA	D45CD-5-49.12	3774121048
K4549MDA	D45CD-4-49.12	3774121047
K4551CDA	D45CD-4-51.31	3774121050
K5015ADA	D50CC-14-14.81	3777921006
K5015DA	D50CC-14-14.81	3777921006
K5040ADA	D50CB-6-40	3777921038
K5040BDA	D50CB-6-40	3777921038
K5042ADA	D50CB-3-42	3777921005
K5067CDA	D56CC-2-67.50	3775921010
K52133ADA	SD52CB-10-132.19	3771532073
K52133DA	SD52CB-6-132.75	3771532057
K5253A	S52DB-7-53.62	3771512052
K5269DDA	SD52CC-25-68.5	3771532053
K5283DDA	SD52CC-25-82.5	3771532054
K5292GDA	SD52CC-25-92.5	3771532055
K5297DDA	SD52CC-25-96.5	3771532052
K53117HDA	SD53CC-30-117.25	3771533057
K53129DDA	SD53CC-30-129	3771533066
K53146BDA	SD63CB-13-146	3771433920
K53180ADA	SD63CB-13-180	3771433919
K53180BDA	SD63CB-13-180	3771433919
K5365B	S53DC-18-64.75	3771513098
K5365CDA	S53DC-21-65	3771513142
K5371J	S53DB-24-71	3771513184
K5381N	S53DC-70-80.75	3771513187

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K5381XDA	S53DC-21-81	3771513143
K5382V	S53DB-24-82	3771513185
K5390B	S53DB-24-92	3771513186
K5391CDA	SD53CC-29-91.50	3771533056
K5538CDA	D55CC-2-38.31	3771921030
K5549ADA	D55CC-12-49.12	3771921050
K5549BDA	D55CC-12-49.12	3771921050
K6042LDA	D60DC-12-42.62	3771421240
K6060CDA	D60DC-8-60	3771421161
K6067GDA	D60DB-16-67.5	3771421181
K6067HDA	D60DB-16-67.5	3771421181
K6067JDA	D60DB-16-67.5	3771421181
K62133ADA	SD62CC-25-132	3771432068
K62133BDA	SD62CC-27-133	3771432074
K6267KDA	D60DB-18-67	3771421184
K6270ADA	SD62CC-23-70	3771432062
K6281ADA	SD62CC-23-81	3771432061
K6283CDA	SD62CC-24-82.5	3771432064
K6292JDA	SD62CC-23-92	3771432060
K6297DDA	SD62CC-24-96.5	3771432063
K63124LDA	SD63CC-28-124	3771433072
K63129DDA	SD63CC-27-129	3771433074
K63129EDA	SD63CC-27-129	3771433074
K63133CDA	SD63CB-26-132.75	3771433930
K63133DDA	SD63CB-26-132.75	3771433930
K63146ADA	SD63CB-13-146	3771433920
K63167DDA	SD63CB-26-167	3771433925
K63167FDA	SD63CB-26-167	3771433925
K63167GDA	SD63CB-27-167	3771433935
K63180BDA	SD63CB-13-180	3771433919
K63198ADA	SD63CB-26-197	3771433931
K63198BDA	SD63CB-26-197	3771433931
K63198CDA	SD63CB-27-195	3771433936
K6380U	S63DC-54-79.31	3771413158
K6392N	S63DC-61-92	3771413159
K6499ADA	S64DC-11-99	3771414048
K74162CDA	SD74CC-13-162.88	3772534042
K74168EDA	SD74CC-15-167.50	3772534049

G S Products

11071 GS	D45CC-18-16.00	3774121040
11080 GS	D40CC-26-91.50	3770821048
11085 GS	D40CC-26-69.00	3770821049

G+H Mfg

020116	SD63DB-20-115.81	3771433943
020133	SD53CB-16-133	3771533093
020210	D70DD-9-79	3773721117
50393	D70DD-9-79	3773721117
5530001	SD53CB-16-150	3771533094
5530002	SD53CB-16-133	3771533093
6040004A	D60DD-20-79	3771421260
7550002	SD73DB-11-146	3772533079
A1162	3782000052	3782000052
A2610	D50CD-4-30	3777921071
A2823	D25AA-2-3.00	3772621143
A4455	D40DD-22-15	3776821087
A4456	D45DD-8-16.75	3774121038
A5340	D30DD-17-48	3770521119
FA1001	D60DD-20-79	3771421260
FA1002	D70DD-9-79	3773721117
H1018	D40CD-15-31.88	3776821090
H1020	D40CD-16-29.50	3776821091
H1232	SD53CB-16-133	3771533093
H1233	SD53CB-16-150	3771533094
H1234	D50CD-4-30	3777921071
H1235	D40DD-22-15	3776821087
H1238	D45DD-8-16.75	3774121038
H2208	SD73DB-10-115	3772533078

G+H Mfg

H3291	D60DD-20-79	3771421260
H3292	D70DD-9-79	3773721117
H5166	SD73DB-10-115	3772533078
H5167	SD73DB-11-146	3772533079
H5176	D70DD-9-79	3773721117
H5196	D40DD-22-15	3776821087
P1331	D60DD-20-79	3771421260
PH-020-002	D40CD-16-29.50	3776821091
PH-020-023	D40CD-15-31.88	3776821090
PH-020-116	SD63DB-20-115.81	3771433943
PH-020-129	SD53CB-8-128	3771533040
PH-020-133	SD53CB-16-133	3771533093
PH-020-157	SD53CB-8-157	3771533041
PH-020-168	D60DD-20-79	3771421260
PH-020-201	D70DD-9-79	3773721117
PH-020-803	D50CD-4-30	3777921071

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1031	D35BB-1-80	3774021012
1039	D60DB-23-72	3771421262
1040	D60LN-2-80	3771421145
1043	D60DB-23-72	3771421262
1054	D70LN-5-80	3773721139
1111	SD63CB-23-118	3771433922
1119	D40BB-2-80	3776821036
1124	D70LN-2-108	3773721022
1126	D60DB-23-72	3771421262
1163	D70LN-2-108	3773721022
1656	D35BB-1-60	3774021011
1944	SD52CB-7-79	3771532059
2145	D60DB-9-136	3771421156
2419	SD62CB-12-114	3771432079
2420	SD62CB-12-79	3771432077
2452	D70LN-2-75	3773721021
2455	D70LN-5-90	3773721140
2460	D70LN-5-80	3773721139
2461	D70LN-2-108	3773721022
2463	D70LN-5-90	3773721140
2464	D35BB-1-80	3774021012
2476	D60LN-2-80	3771421145
2477	D60LN-2-75	3771421148
2494	SD62CB-12-94	3771432078
3062AO	D60LN-2-80	3771421145
3074	D35BB-1-80	3774021012
3090	D50DB-4-42	3777921009
3091	D60BB-3-4.81	3771421139
3106	D60BB-3-4.81	3771421139
3116	SD62CB-12-114	3771432079
3130	D70LN-2-108	3773721022
3131	SD62CB-12-94	3771432078
3139	SD62CB-12-114	3771432079
3242	SD62CB-12-94	3771432078
3412	D60DB-23-72	3771421262
3421	D50DB-2-54	3777921011
3429	D35BB-1-60	3774021011
3467	D50DB-8-66	3777921013
3511	D50DB-8-66	3777921013
3513	D30CD-8-16	3770521069
3520	D50DB-8-66	3777921013
3608	D30DB-1-32	3770521070
3653	S31CB-1-32	3770711031
3654	D60DB-8-72	3771421153
3657	D65DB-2-144	3773921044
3759	D50DB-2-54	3777921011
3760	D50DB-8-66	3777921013
3761	D60DB-10-90	3771421154
3763	D50DB-1-20	3777921007
3765	D50DB-4-42	3777921009
3766	D50DB-4-42	3777921009

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3890	D35CD-8-32	3774021015
3891	D40CD-16-29.50	3776821091
3902	SD62CB-12-114	3771432079
3903	SD62CB-12-94	3771432078
3904	SD85DB-6-248	3772935042
4073	SD85DB-6-272	3772935043
4163	SD85DB-6-272	3772935043
4164	SD74DB-9-200	3772534047
4191	D35BB-1-60	3774021011
4271	D50DB-2-54	3777921011
4272	D50DB-8-66	3777921013
4297	SD74DB-9-176	3772534046
4298	SD85DB-6-224	3772935041
4299	SD85DB-6-248	3772935042
4321	D50DB-8-66	3777921013
4322	D60DB-7-56	3771421152
4359	D50DB-4-42	3777921009
4383	SD74DB-9-200	3772534047
4516	SD63CB-14-136	3771433106
4557	D60DB-9-116	3771421155
4558	D70DB-4-116	3773721026
4585	SD63CB-14-173	3771433107
4635	D35BB-1-60	3774021011
4636	D35BB-1-80	3774021012
4649	D35BB-2-38	3774021016
4815	D60LN-2-80	3771421145
4838	D40DD-12-24	3776821034
4866	D40DD-12-24	3776821034
4893	SD74DB-9-176	3772534046
5462	D50DB-1-20	3777921007
7392	D60BB-3-4.81	3771421139
8425	D50DB-12-54	3777921021
8433	D60LN-2-75	3771421148
8526	D40DD-11-32	3776821031
8679	D60DB-9-116	3771421155
8680	D70DB-4-116	3773721026
8789	D50DB-4-42	3777921009
8973	SD62CB-12-79	3771432077
8976	SD63DB-15-84	3771433108
9009	D50DB-8-66	3777921013
9010	D50DB-9-66	3777921014
9015	D50DB-5-54	3777921010
9016	D50DB-12-54	3777921021
9017	D50DB-3-42	3777921008
9018	D50DB-4-42	3777921009
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9488	D65DB-2-144	3773921044
9498	SD42CB-5-192	3771032024
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9587	D40HB-1-36	3776821032
9627	S53DC-17-180	3771513096
9759	D60DB-8-72	3771421153
9780	D40BB-1-48	3770821034
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9892	D60DN-2-90	3771421149
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9921	D70LN-5-80	3773721139
9922	D70LN-2-108	3773721022
9923	D40BB-2-90	3776821037

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9924	D70LN-2-75	3773721021
9932	D50BB-3-52	3777921016
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9934	D70DB-4-116	3773721026
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A1245	D60LN-2-75	3771421148
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A1465	SD63CB-14-173	3771433107
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A1913	D70HB-3-24	3773721028
A1913C	D70HB-3-24	3773721028
A1915	D60HB-4-42	3771421170
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A1917	D40HB-1-36	3776821032
A1918	D40HB-1-26	3776821035
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A1925	D35HB-1-30	3774021014
A1927	D80LB-1-62	3779221001
A1928	D70LB-3-62	3773721141
A1929	D70HB-3-52	3773721027
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A1930C	D60HB-4-42	3771421170
A1931	D60HB-3-52	3771421169
A1931C	D60HB-3-52	3771421169
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A1969	D70LN-5-90	3773721140
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A2079	SD74DB-9-176	3772534046
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A2191	D40DD-12-24	3776821034
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A2194	D40BB-2-90	3776821037
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A2201	D50DB-8-66	3777921013

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A3099	D40HB-1-36	3776821032	Galfab		
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A3105	D50DB-1-20	3777921007	PC5	SD63CB-23-118	3771433922
A3107	D50DB-4-42	3777921009			
A3109	D50BB-3-52	3777921016	Garwood		
A3111	D50DB-5-54	3777921010	207-2368	D50CC-22-20	3777921064
A3113	D50DB-8-66	3777921013	20		



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1-2840	B4284	3790004284
1-2847	C4075	3790004075
1-2847-1	C4075	3790004075
1-2878	SD85CC-7-300	3773035013
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1-3692	D25LD-3-66	3772621122
1-3693	D50CE-2-43.75	3777921057
1-3695	D25LD-3-94	3772621123
1-3705	D60DB-20-63	3771421215
1-3717	D25LD-2-90	3772621121
1-3727	D30CA-2-3.62	3770521101
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1-3836	SD64CC-7-118	3771434037
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1-4110	C3850	3790003850
1-4123	C4438	3790004438
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1-4270	SD74DB-4-171	3772534031
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1-4275	C3576	3790003576

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1-4305	C4438	3790004438
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1-4338	C3576	3790003576
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1-4887	D55CC-10-24.25	3771921043
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1-5111	D55CC-10-24.25	3771921043
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1-5147	SD53CC-51-182	3771933032
1-5148	SD53CC-41-141.38	3771933021
1-5149	SD53CC-51-151.5	3771933036
1-5150	D45CC-19-41.50	3774121041
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1-6067	SD53CC-51-182	3771933032
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1-6070	D30CC-13-21.62	3770521098
1-6075	SD53CD-4-169	3771933018
1-6076	SD53CC-51-182	3771933032
1-6077	SD53CC-41-141.38	3771933021
1-6078	SD53CC-51-151.5	3771933036
1-6094	D30CC-16-30.50	3770521106
1-6096	SD53CD-4-182	3771933016
1-6099	SD53CD-4-182	3771933016
1-6100	SD53CD-4-169	3771933018
1-6117	S63DC-79-67	3771413260
1-6121	S52DB-9-67.50	3771512080
1-6126	D40CC-27-19	3776821094
1-6142	D30CC-13-21.62	3770521098

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1-6153	D30CA-2-3.62	3770521101
1-6157	S52CC-41-54.62	3771512092
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1-6160	D30CC-20-8.00	3770521113
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1-6162	D17AE-2-71.88	3778121003
1-6163	D30CE-11-18.50	3770521112
1-6164	D50CC-25-43	3777921075
1-6169	D30CC-18-8.00	3770521110
1-6191	S52CC-41-54.62	3771512092
1-6194	D17AE-2-71.88	3778121003
1-6225	SD64DC-6-110.34	3771434056
1-6230	D55CC-6-63	3771921033
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1-6250	SD53CD-4-169	3771933018
1-6251	SD53CC-41-141.38	3771933021
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1-6257	SD53CD-4-169	3771933018
1-6316	SD53CC-51-151.5	3771933036
1-6317	SD53CC-54-170.12	3771933035
1-6318	SD53CC-51-182	3771933032
1-6330	D30CC-18-8.00	3770521110
1-6331	D30CC-18-8.00	3770521110
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1-6407	D30CC-20-8.00	3770521113
1-6416	D30CC-18-8.00	3770521110
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1-6457	D55CC-7-24	3771921039
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1-6522	D30CA-2-3.62	3770521101
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1-6570	D50LC-2-24.50	3777921068
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1-6611	D55CC-10-24.25	3771921043
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1-6670	D40CD-8-22	3776821067
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1-6777	D40CD-14-25	3776821084

Huge Haul

01-0207	SD63CB-23-118	3771433922
4-01-0207	SD63CB-23-118	3771433922

Impact / Mabbar

0020-009	SD62MC-12-186	3771432045
0020-017	SD62MC-12-210	3771432046
0020-028	SD62MC-12-234	3771432047

Kann Mfg

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1400108	B5066	3790005066
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1400116	B5355	3790005355
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1400122	SD63CB-CP457-167	3799000457
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1400124	B5703	3790005703
1400125	B5704	3790005704
1400126	B5705	3790005705
1400127	B5706	3790005706
1400128	D30LD-10-36	3770521127
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1400132	B5711	3790005711
1400133	B5710	3790005710
1400134	B5702	3790005702
1400135	D35CC-28-38	3773821086
1400136	B5773	3790005773
1400137	SD63CB-CP574-120	3799000574
1400138	B5850	3790005850
1400139	B5851	3790005851
1400140	SD63CB-29-138	3771433948
1400141	B5879	3790005879
1400142	B5880	3790005880
1400147	SD52DB-CP547-84	3799000547
1400148	SD52DB-CP557-70	3799000557
1400150	B5983	3790005983
1400153	SD63CB-CP620-94	3799000620
1400156	B6367	3790006367
1400165	SD52CB-11-85	3771532075
1400169	SD53CB-17-121	3771533101
1400172	D40DD-22-15	3776821087
1400173	D25AA-2-3.00	3772621143
1400174	D50CD-4-30	3777921071
1400175	D45DD-8-16.75	3774121038
1400177	D55CB-5-49.88	3771921034
1400178	D25CC-10-14.12	3772621119
1400180	SD53CB-18-138	3771533109
3701054	B4775	3790004775
3750012	B5329	3790005329
3850017	D35DD-3-16	3790005389
3850083	C5267	3790005267
P4073-1	SD62CB-13-84	3771432080
P4073-T	SD62CB-13-84	3771432080
P4074-1	SD52CC-29-72	3771532074
P4074-T	SD52CC-29-72	3771532074

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21-141 D70LN-5-80 3773721139

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020-9431-20 D50DC-4-40 3771521170

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HYC00315 D25LC-3-28 3772621140
 HYC00320 D25LC-4-39 3772621148
 HYC00360 D25DD-6-14.50 3772621141
 HYC00510 D50DC-4-40 3771521170
 HYC01550 D32CC-12-15.50 3770721133
 HYC02300 D50DC-5-84.13 3777921074
 HYC01550 D32CC-12-15.50 3770721133

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15373 D40CD-11-15 3776821074
 16902 SD83CC-27-126 3772933013
 200868 SD75OO-2-113 3772535005
 200869 SD75OO-1-100 3772535004
 200870 SD64OO-1-87 3771434023
 201500 SD86OO-1-146 3772936002
 20278 SD75OO-1-100 3772535004
 209785 SD63DC-19-81 3771433946
 209786 SD63DC-19-101 3771433937
 209787 SD64DC-5-145 3771434054
 210629 S35CL-2-32.69 3776815003
 210658 D45CC-16-32.50 3774121037
 210659 D55CC-8-37 3771921040
 210847 SD64DC-5-156 3771434055
 2R1006A D60BC-5-30.31 536 3771421251
 2R1008R D60BC-5-30.31 495 3771421251
 300679 D60BC-5-30.31 495 3771421251
 300900 D60BC-5-30.31 495 3771421251
 300990 D60BC-5-30.31 495 3771421251
 302385 D30DD-13-14.25 3770521096
 302514 D20LL-6-3.25 3770121130
 302525 SD63CC-23-167 3771433059
 302549 D30LD-6-28.62 3770521103
 303407 SD63CC-23-167 3771433059
 303904 D60BC-5-30.31 495 3771421251
 304000 SD63CC-23-167 3771433059
 304168 D60BC-5-30.31 3771421251
 304805 D60BC-5-30.31 536 3771421251
 305111 SD63CC-23-146 3771433064
 305112 D45CC-13-42 3774121030
 305127 D45CC-13-42 3774121030
 305240 D45LC-2-44.25 3774121029
 305241 D45LC-2-44.25 3774121029
 305687 SD63CC-29-146 3771433077
 305688 SD63CC-39-167 3771433906
 305827 D60BC-5-30.31 495 3771421251
 305960 D20CL-2-12.75 3770121132
 305972 D60CF-3-32.38 3771421225
 305975 D60CF-2-57 3771421223
 306459 D45LC-2-42 3774121028
 306460 D30LD-5-28.62 3770521095
 306462 D25CC-12-100.50 3772621127
 306463 D45CC-13-42 3774121030
 306464 D45CC-13-42 3774121030
 306465 D45LC-2-44.25 3774121029
 306466 D20CL-2-12.75 3770121132
 306562 D60BC-5-30.31 495 3771421251
 306633 D45CC-13-42 3774121030
 306634 D45CC-13-44.25 3774121031
 306635 D45LC-2-42 3774121028
 306636 D45LC-2-44.25 3774121029
 306811 D25CC-12-87.50 3772621126
 307081 D60BC-5-30.31 3771421251
 307082 D60BC-6-27.81 3771421256
 307534 D35CD-9-26.75 3773821061

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32046 D60BC-5-30.31 495 3771421251
 37815 SD83CC-27-126 3772933013
 39726 SD86CC-1-171 3772936001
 400383 D60CF-3-32.38 3771421225
 400496 S21LL-2-1.5 3771411106
 400753 S41LC-1-39.38 3771011057
 401056 S41LC-1-39.38 3771011057
 401207 D40CD-11-15 3776821074
 401966 D50CB-9-32.50 3777921067
 402051 D40CL-5-32.69 3776821116
 402087 D60CF-2-57 3771421223
 402160 S41LC-1-39.38 3771011057
 402324 S41LC-1-39.38 3771011057
 402979 SD75MC-1-200 3772535008
 403261 D50CB-9-32.50 3777921067
 404411 D50CB-9-32.50 3777921067
 405089 S41LC-1-39.38 3771011057
 405112 D40CL-5-32.69 3776821116
 405964 D40CD-11-15 3776821074
 406368 D60CF-3-32.38 3771421225
 406369 S41LC-1-39.38 3771011057
 406370 S21LL-2-1.5 3771411106
 406399 S41LC-1-39.38 3771011057
 406578 D50CB-9-32.50 3777921067
 406579 D40CL-5-32.69 3776821116
 406582 D60CF-2-57 3771421223
 406639 S41LC-1-39.38 3771011057
 407028 D40CL-3-23.50 3776821076
 41296 SD85CC-15-125 3772935003
 41297 SD84CC-11-104 3772934012
 41298 SD85CC-15-125 3772935003
 41354 D60CF-3-32.38 3771421225
 41357 D60CF-3-32.38 3771421225
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 602163 D30LD-6-28.62 3770521103
 605250 D40CD-11-15 3776821074
 700081 D60BC-5-30.31 528 3771421251
 700289 D60BC-6-27.81 528 3771421256
 701479 S35CL-2-32.69 3776815003
 704647 D45CC-16-32.50 3774121037
 709174 S35CL-2-32.69 3776815003
 713757 D45CC-16-32.50 3774121037
 713764 D55CC-8-37 3771921040
 713767 D60CF-2-57 3771421223
 715101 D50CB-9-32.50 3777921067
 717488 D60BC-5-30.31 528 3771421251
 718876 SD64DC-5-145 3771434054
 718878 SD63DC-19-101 3771433937
 718909 SD63DC-19-81 3771433946
 718912 SD64DC-5-156 3771434055
 D40CL-5-32.69 D40CL-5-32.69 3776821116
 PO1166 D60CF-3-32.38 3771421225
 PO265 S41LC-1-39.38 3771011057

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11071 SD64CC-10-126 3771434050
 11074 SD64MC-1-114 3771434004
 11079 D52CD-73-41 3771521111
 11081 SD63MB-10-148 3771433011
 11083 SD63MB-10-128 3771433010
 11085 SD63MB-10-95 3771433009
 11088 SD64MC-1-146 3771434011
 11100 SD75CC-5-159 3772535013
 11102 SD64MC-1-111 3771434013
 14962 S51CC-26-22 3771511033
 14963 S41CC-29-18 3771011039
 14964 D42CD-86-48 3771021101
 14965 D42CD-86-31 3771021100
 14966 D52CD-73-41 3771521111

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14967.....	D52CB-29-16	3771521109
14968.....	D72CD-24-16	3772521036
14969.....	D40CB-8-21	3776821085
14970.....	D52CB-30-38	3771521110
150003-1	SD63MB-10-115	3771433015
150005-1	SD63MB-10-148	3771433011
150006-1	SD63MB-10-95	3771433009
150007-1	D52CB-29-16	3771521109
150009-1	D42CD-86-48	3771021101
150010.....	D42CD-86-31	3771021100
150010-1	D42CD-86-31	3771021100
150011-1	S51CC-26-22	3771511033
150018-1	D42CD-86-31	3771021100
150029-1	S41CC-29-18	3771011039
150033-1	D72CD-24-16	3772521036
150037-1	SD63MB-10-128	3771433010
150039.....	D52CB-30-38	3771521110
150040-1	D40CB-8-21	3776821085
150042-1	SD63MB-10-95	3771433009
150043-1	SD63MB-10-115	3771433015
150044-1	SD63MB-10-148	3771433011
150045-1	SD63MB-10-128	3771433010
150046-1	S51CC-26-22	3771511033
150047-1	S41CC-29-18	3771011039
150048-1	D42CD-86-48	3771021101
150049-1	D42CD-86-31	3771021100
150050-1	D52CB-29-16	3771521109
150051-1	D40CB-8-21	3776821085
150053-1	D52CD-73-41	3771521111
150054-1	S51CC-26-22	3771511033
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150070.....	D72CD-24-16	3772521036
150071-1	D52CD-73-41	3771521111
150072-1	SD64CC-10-126	3771434050
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150075.....	SD63MB-10-115	3771433015
150076.....	SD63MB-10-148	3771433011
150077.....	SD63MB-10-128	3771433010
150079-1	S41CC-29-18	3771011039
150080-1	D42CD-86-48	3771021101
150082-1	D52CB-29-16	3771521109
150083-1	D40CB-8-21	3776821085
150084.....	D52CB-30-38	3771521110
150089-1	SD64CC-5-107	3771434029
150094.....	SD64MC-1-114	3771434004
150124-1	S41CC-29-18	3771011039
150125-1	S51CC-26-22	3771511033
150126.....	D52CD-73-41	3771521111
150127.....	D72CD-24-16	3772521036
150128.....	SD63MB-10-148	3771433011
150129.....	D52CB-29-16	3771521109
150130.....	D52CB-30-38	3771521110
150131-1	D42CD-86-48	3771021101
150132.....	SD63MB-10-128	3771433010
150133.....	SD63MB-10-95	3771433009
150134-1	D42CD-86-31	3771021100
150151-1	SD64MC-1-146	3771434011
150206.....	SD75CC-5-159	3772535013
150208-1	SD64MC-1-81	3771434025
150209-1	SD64MC-1-101	3771434024
150210-1	SD64MC-1-111	3771434013
150570.....	D30CB-5-16	3770521107
150586.....	SD64CC-10-126	3771434050
15409.....	SD64MC-1-101	3771434024
15422.....	D30CB-5-16	3770521107
15430.....	SD63MB-10-115	3771433015
15872.....	D72CD-24-16	3772521036
16058.....	SD64MC-1-81	3771434025
16199.....	23586	3759006830

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17479.....	SD64MC-1-101	3771434024
17506.....	SD64CC-10-126	3771434050
17673.....	SD64MC-1-81	3771434025
17674.....	SD64MC-1-101	3771434024
17675.....	SD64MC-1-114	3771434004
17676.....	SD64MC-1-111	3771434013
17677.....	SD64MC-1-146	3771434011
17678.....	SD64CC-10-126	3771434050
17834.....	D55CB-7-40.50	3771921042
20146.....	SD64CC-5-107	3771434029
20147.....	SD64CC-12-113	3771434057
20148.....	SD64CC-10-147	3771434051
22968.....	D42CD-86-31	3771021100
22972.....	D42CD-86-48	3771021101
22973.....	D52CB-29-16	3771521109
22974.....	D55CB-7-40.50	3771921042
22975.....	D72CD-24-16	3772521036
22977.....	D40CB-8-21	3776821085
22978.....	D52CD-73-41	3771521111
23585.....	S51CC-26-22	3771511033
750006.....	S51CC-26-22	3771511033
750010.....	D52CD-73-41	3771521111
750011.....	D52CB-29-16	3771521109
750012.....	D72CD-24-16	3772521036
750013.....	D40CB-8-21	3776821085
750174.....	23586	3759006830
750177.....	D50CB-10-49	3777921072
750182.....	D55CB-7-40.50	3771921042
EO 3760	SD64CC-5-107	3771434029

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9930216.....	SD84CC-21-135	3772934037
9930230.....	SD74CC-12-135	3772534033
9930251.....	SD52CC-24-111	3771532049
9930254.....	SD42CC-19-111	3771032025
9930258.....	SD95CC-3-160	3773135018
9930260.....	SD84CC-21-135	3772934037
9930272.....	SD42CC-19-111	3771032025
9930303.....	SD42CC-19-111	3771032025
9930341.....	SD53CC-36-155	3771533084
9930361.....	SD53CC-36-155	3771533084

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04-0127.....	D70DD-7-79	3773721110
04-0670.....	D100DD-2-96	3772321025
04-0680.....	D100DD-2-128	3772321021
04-2000.....	D60DB-23-72	3771421262
04-2001.....	SD63CB-23-118	3771433922
04-2002.....	D70LN-3-80	3773721111
04-2003.....	D70LN-5-90	3773721140
92-3650	SD63DB-17-108	3771433929

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202104.....	C3831	3790003831
202322.....	C4184	3790004184
213035.....	C4184	3790004184
222740.....	C3694	3790003694
401216.....	S53DB-22-63	3771513182
401222.....	D60DD-4-69	3771421090
401281.....	B4099	3790004099
401282.....	B3759	3790003759
404600.....	B3759	3790003759
404601.....	B4099	3790004099
404614.....	C3694	3790003694
404800.....	C3820	3790003820
404905.....	D3832	3790003832
800000.....	C3831	3790003831
801374.....	C3831	3790003831
D2382A.....	C3820	3790003820

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D2778	C3831	3790003831
D2812	C3694	3790003694
D2816	D3832	3790003832

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1001134	D50DB-7-40	3777921015
1001135	D50DB-7-40	3777921015
1001139	D60DB-13-54	3771421164
1001140	D60DB-14-58	3771421165
1001141	D60CC-26-78	3771421146
1001143	D60DB-12-108	3771421160
1001144	SD72DB-3-76	3772532030
1001145	D70CC-7-78	3773721011
1001146	D70DB-2-115	3773721013
1001147	SD73DB-8-115	3772533069
1001149	SD85CC-24-236	3772935044
1001151	SD85MC-21-384	3772935038
1001152	SD85CC-24-304	3772935049
1001154	SD96MC-8-384	3773136017
1001155	SD96MC-5-456	3773136007
1001156	SD96MC-8-480	3773136025
1001157	D100DB-3-155	3773121042
1002190	D62LB-5-80	3771421180
1002191	D72LB-9-80	3772521122
1002432	SD73DB-8-160	3772533068
HCL10X155	D100DB-3-155	3773121042
HCL5X31	D50DB-7-40	3777921015
HCL5X40	D50DB-7-40	3777921015
HCL6X108	D60DB-12-108	3771421160
HCL6X54	D60DB-13-54	3771421164
HCL6X58	D60DB-14-58	3771421165
HCL6X78	D60CC-26-78	3771421146
HCL72X77	SD72DB-3-76	3772532030
HCL73X115	SD73DB-8-115	3772533069
HCL7X115	D70DB-2-115	3773721013
HCL7X78	D70CC-7-78	3773721011
HCL85X236	SD85CC-24-236	3772935044
HCL85X384	SD85MC-21-384	3772935038
HCL95X303	SD85CC-24-304	3772935049
HCL96X384	SD96MC-8-384	3773136017
HCL96X456	SD96MC-5-456	3773136007
HCL96X480	SD96MC-5-480	3773136008
K5067EDA	SD51CB-2-67.5	3771931001
MMH1501000	SD72DB-3-76	3772532030
MMH1601000	D60CC-26-78	3771421146

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0126158	S63DC-77-66	3771413258
0126248	B6225	3790006225
0126256	D45DD-10-52.75	3774121054
0126257	B5427	3790005427
0126261	B6273	3790006273
0126262	B6242	3790006242
0601048	D3784	3790003784
0601930	S28CC-2-38.00	3776718001
0604124	SD53CC-48-164	3771933024
0604126	D60DC-13-65.75	3771421247
0604134	D50DD-29-25.62	3777921097
0604135	D55DD-14-38.62	3772921049
0604136	S31CB-2-42	3773811005
0604137	SD74DC-7-119	3772534040
0604138	SD85DC-7-163	3772935036
0604139	SD63DC-74-71.75	3771433939
0604142	SD63DC-7-88	3771433071
0604143	D4291	3790004291
0604144	D4292	3790004292
0604145	D45DD-9-23	3774121049
0604146	D50DD-30-32.50	3777921098

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0604149	D4389	3790004389
0604976	D50DD-32-37.25	3777921102
0605700	B5473	3790005473
0605702	D30CL-5-24	3770521130
0605951	B6190	3790006190
0605952	B6191	3790006191
0606950	C3847	3790003847
0606953	B5347	3790005347
0606956	SD74DC-CP410-104	3799000410
0606960	C3850	3790003850
0606967	SD63DC-CP507-82	3799000507
0606969	SD63DC-7-61	3799000441
0606971	SD63DC-CP493-46	3799000493
0614333	D35CC-27-26	3773821085
0614371	D20DD-8-95	3770121144
0614374	SD53CC-48-170	3771933027
0615860	C4539	3790004539
0615862	S64DB-10-73	3771414053
0617862	B4708	3790004708
0619876	D30CD-9-20	3790005461
0619881	C5219	3790005219
0619882	D32LL-11-38	3770721137
0619891	D45CC-20-46	3774121043
0622238	D60DB-20-63	3771421215
0633832	S75DB-CP394-86	3799000394
0633849	B6310	3790006310
0634906	D20LL-8-20	3790005724
0635876	D50DD-28-39.50	3777921096
0636002	S74DC-70-84	3772514113
0636375	B6293	3790006293
0637007	D30CD-11-21.25	3770521104
0637008	D50DD-23-52.75	3777921066
0637009	D25LL-19-38	3772621150
0637010	D25LL-20-38	3772621153
0637507	B5959	3790005959
0637509	B5955	3790005955
0638264	B6387	3790006387
0642850	B5427	3790005427
0642852	S53DB-22-63	3771513182
0642853	B5491	3790005491
0651550	D62LB-5-80	3771421180
0654696	B6071	3790006071
0660009	D30CD-12-20	3775421003
0660011	B6353	3790006353
0660777	D40CC-28-46	3776821107
0660778	D20DD-8-95	3770121144
0660779	B6216	3790006216
0660780	B6264	3790006264
0660781	D30CD-12-20	3775421003
0661950	SD63CC-44-164	3771833011
0661951	SD63CC-44-181	3771833010
0663500	B6314	3790006314
0672120	B6188	3790006188
0672121	B6189	3790006189
0672135	B6311	3790006311
0673089	SD63DC-75-76	3771433944
0673894	SD63DC-CP604-97	3799000604
1000066	C5219	3790005219
1000067	D32LL-11-38	3770721137
1000068	D35CC-27-26	3773821085
1000069	D45CC-20-46	3774121043
1000075	B5491	3790005491
1000077	D20DD-8-95	3770121144
1000078	S28CC-1-16	3776721044
1000081	SD53CC-48-164	3771933024
1000085	D4241	3790004241
1000087	D4389	3790004389
1000092	C4539	3790004539
1000094	D50DD-28-39.50	3777921096

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1000095	B5427	3790005427
1000156	D40CC-28-46	3776821107
1000158	D40CC-28-46	3776821107
1000159	B6216	3790006216
1000160	D20DD-8-95	3770121144
1000161	D25LL-19-38	3772621150
1000162	B5955	3790005955
1000163	B5956	3790005956
1000166	D50DD-23-52.75	3777921066
100LX0008	B6487	3790006487
1100028	D30CD-12-20	3775421003
1100031	D45DD-10-52.75	3774121054
1100038	D60DC-13-65.75	3771421247
1100045	B6310	3790006310
1100104	B6314	3790006314
1100105	D25LL-20-38	3772621153
1100106	B6387	3790006387
1100116	SD53CC-48-170	3771933027
1100117	D30CL-5-24	3770521130
1100314	B6447	3790006447
1101139	B6469	3790006469
1101709	D60CC-45-65.75	3775921011
1102355	B6497	3790006497
1103780	B6546	3790006546
1103899	B6487	3790006487
1103900	B6488	3790006488
1104721	B6576	3790006576
1104722	B6577	3790006577
1104922	D50DD-21-39.50	3777921061
1105098	B6585	3790006585
1105099	B6586	3790006586
1105118	B6591	3790006591
1105331	S53MB-CP677-166	3799000677
1106169	S35CC-4-37	3776815004
1106845	D40LD-10-24.75	3776821110
1106846	D45CD-5-49.12	3774121048
1106957	B5347	3790005347
1106958	C3847	3790003847
1106959	C3850	3790003850
1107471	SD63CB-26-167	3771433925
1107676	D50CC-25-43	3777921075
1107995	D17AE-2-71.88	3778121003
1107996	D30CC-20-8.00	3770521113
1108087	SD63DB-17-108	3771433929
1108088	D30CL-3-18.44	3770521099
1108089	D45CC-14-41.50	3774121035
1108091	D30CC-17-28.19	3770521108
1108092	D55CC-6-63	3771921033
1108093	D40CD-13-37	3776821078
1108095	S52DB-9-67.50	3771512080
1108096	B5743	3790005743
1108097	D30CC-19-16.00	3770521111
1108100	C3876	3790003876
1108101	C4438	3790004438
1108102	D50DC-3-45	3777921070
1108103	D30CL-2-25.25	3770521093
1108104	D55DB-2-63	3771921035
1108107	D45CC-19-41.50	3774121041
1108108	D30CC-18-8.00	3770521110
1108110	D30CC-19-16.00	3770521111
1108220	B6622	3790006622
1108286	D55DD-14-38.62	3771921049
1108287	D50DD-29-25.62	3777921097
1108290	S28CC-2-38.00	3776718001
1108291	D50DD-30-32.50	3777921098
1108292	D45DD-9-23	3774121049
1108293	S31CB-2-42	3773811005
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1108626	B6642	3790006642

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1109037	SD53CD-4-169	3771933018
1109039	SD53CC-51-182	3771933032
1109095	D30CE-11-18.50	3770521112
1109096	D30CC-20-8.00	3770521113
1109097	D30CC-18-8.00	3770521110
1109305	SD63CC-39-167	3771433906
1109306	D35CD-7-51.31	3774021009
1109307	D30LD-4-24	3770521071
1109314	SD64DC-5-145	3771434054
1109318	SD63DC-19-101	3771433937
1109366	D4292	3790004292
1109367	D4291	3790004291
1109368	D50DD-32-37.25	3777921102
1109369	B5473	3790005473
1109370	D30CL-5-24	3770521130
1109608	S35CL-2-32.69	3776815003
1109609	D40CD-11-15	3776821074
1109611	D40CL-5-32.69	3776821116
1109612	S41LC-1-39.38	3771011057
1109613	D45CC-16-32.50	3774121037
1109615	D55CC-8-37	3771921040
1109616	D40CD-11-15	3776821074
1109698	D30CA-2-3.62	3770521101
1109699	D60DB-23-72	3771421262
1109700	D70LN-5-80	3773721139
1109748	C4750	3790004750
1109749	D25LL-17-12.00	3772621145
1130000	SD63CC-44-164	3771833011
1130001	SD63CC-44-181	3771833010
1130176	B6487	3790006487
1130177	B6488	3790006488
1130637	D55CC-9-35.88	3771921041
1130638	D40CD-14-25	3776821084
1130640	D30CC-13-21.62	3770521098
1130642	D50CC-25-43	3777921075
1131012	D30CC-16-30.50	3770521106
1131025	S35CC-2-24.75	3776815001
1131210	D40CD-8-22	3776821067
1131218	D35BB-1-60	3774021011
1131389	D40DB-7-28.5	3776821123
1131393	C3563	3790003563
1131713	B5789	3790005789
1132626	D20DD-6-6.25	3770121136
1132628	SD53CC-37-168	3771433914
1132629	D20DD-6-6.25	3770121136
1132630	D20DD-3-67	3770121123
1132744	D35LL-9-38	3773821059
1132745	D60CB-5-26	3771421220
1132746	D60CL-2-40	3771421221
1132757	SD63CB-23-118	3771433922
1136596	S35CC-3-24.38	3776815002
1136597	S52CC-41-54.62	3771512092
1136598	D30CC-16-30.50	3770521106
1136602	C3603	3790003603
1136603	C3875	3790003875
1136607	SD53CC-51-151.5	3771933036
1136608	SD63DB-6-93	3771433073
1136610	SD63DB-7-132	3771433046
1136612	SD74DB-4-171	3772534031
1136622	SD63CC-28-124	3771433072
1137327	D40CC-27-19	3776821094
1137328	S52CC-41-54.62	3771512092
1137329	D55CC-7-24	3771921039
1138456	D45CD-4-51.31	3774121050
1138697	SD63CB-26-197	3771433931
1139663	D40LD-11-24.75	3776821112
1139665	D60DC-12-42.62	3771421240
1139666	D40DB-7-28.5	3776821123

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1142458	SD63CC-44-181	3771833010
1143954	S74MM-7G-170	3772514104
1144059	SD63CC-44-164	3771833011
1144295	D60CB-5-26	3771421220
1144296	SD52DC-13-140	3771532072
1144302	SD64DC-5-156	3771434055
1144606	SD63CC-11-96	3771433044
1144702	D20DD-8-95	3770121144
1144703	D32LL-11-38	3770721137
1144704	D35CC-27-26	3773821085
1144705	B4708	3790004708
1144707	D25LL-20-38	3772621153
1144708	D45CC-20-46	3774121043
1145280	C4539	3790004539
1145282	D45DD-10-52.75	3774121054
1145283	D20DD-6-6.25	3770121136
1145284	D30DD-12-9.12	3790005740
1145515	D40CC-28-46	3776821107
1145516	D20DD-8-107	3770121139
1145517	B6216	3790006216
1145518	B6642	3790006642
1145616	D35DD-7-17.88	3773821092
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1145618	B5899	3790005899
1145619	B6546	3790006546
1145647	B6643	3790006643
1145648	D20DD-6-6.25	3770121136
1145649	B6622	3790006622
1145650	D20DD-3-67	3770121123
1145651	SD53CC-37-168	3771433914
1146255	D60DB-16-67.5	3771421181
1146285	D62LB-5-80	3771421180
1147920	SD74DC-7-119	3772534040
1147929	SD74DC-CP615-138	3799000615
1148048	SD52DC-CP627-55	3799000627
1148071	SD52DC-CP626-38	3799000626
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1148322	C3850	3790003850
1148497	S63DC-77-66	3771413258
1148535	S64DB-10-73	3771414053
1148536	S53DB-22-63	3771513182
1148537	S75DB-CP394-86	3799000394
1148910	SD74DB-4-171	3772534031
1149084	D40DD-16-22.50	3776821069
1149090	D25LL-16-24	3772621136
1149192	D40CD-14-25	3776821084
1149523	D40CB-10-42	3776821106
1149547	D25LL-12-16	3772621129
1149552	D35CD-10-20	3773821065
1149553	D40DD-17-42	3776821070
1149557	D40DD-19-22.50	3776821080
1149560	D40CC-25-32	3776821088
1149561	D45CC-17-45	3774121039
1149600	D50DC-4-40	3771521170
1149601	D60CC-45-65.75	3775921011
1149965	D25LD-3-66	3772621122
1149966	D40CD-9-21.50	3776821077
1149967	D25LD-3-94	3772621123
1149968	D45CC-19-41.50	3774121041
1149969	SD64MC-CP652-215	3799000652
1149970	SD64MC-CP639-191	3799000639

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1150058	SD63CD-2-177	3771433940
1150060	S63MB-14-163.12	3771413254
1150061	S52DC-10-89.38	3771512077
1151215	S53DB-25-72	3771513188
1151216	D25LL-15-84	3772621133
1151217	D25LL-14-42	3772621131
1151218	D40CL-13-45.38	3776821120
1151219	D45LD-7-45.38	3774121032
1151220	D35LD-5-19	3773821057
1151221	D60DD-20-79	3771421260
1151222	D70DD-9-79	3773721117
1151224	D40MD-1-72	3776821092
1151225	B4775	3790004775
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1151228	D65CC-9-66	3773921049
1151229	D35CC-28-38	3773821086
1151230	B5773	3790005773
1151231	D30CD-13-28	3770521128
1151232	D35LL-8-16	3790005424
1151233	D35LL-7-16	3790005423
1151234	SD52DB-CP547-84	3799000547
1156041	SD63CB-26-167	3771433925
1156058	S63DC-80-74.19	3771413261
1156067	D25CC-10-14.12	3772621119
1156068	D55CB-5-49.88	3771921034
1156069	D55CB-6-52.88	3771921038
1156344	S52CC-41-67.25	3771512091
1164534	SD53CD-3-156.88	3771933019
1164535	SD53CD-3-168	3771933012
1164536	SD53CD-3-185.75	3771533089
1178457	D32CC-12-15.50	3770721133
1180843	D25LD-2-90	3772621121
1180847	D30CC-20-8.00	3770521113
1180848	C3602	3790003602
1180849	C3576	3790003576
1180858	D45CC-19-41.50	3774121041
1180859	D40CD-8-22	3776821067
1180860	D50CC-24-34.19	3777921069
1180862	D30CC-17-28.19	3770521108
1180863	D40LB-2-35.31	3776821105
1180868	D30CC-17-28.19	3770521108
1180870	C3820	3790003820
1180872	D35LD-1-16	3773821028
1180873	D35CD-11-19	3773821068
1181011	D20LL-7-24	3770121134
1181012	D15DD-4-30	3776921020
1181025	SD53CC-48-164	3771933024
1182845	D40DD-17-42	3776821070
1226778	D55CC-12-49.12	3771921050
1227259	D30LD-8-33.38	3770521123
1227560	D30DD-15-89	3770521116
1227639	C3694	3790003694
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1227648	D40DD-2-51	3770821019
1227659	C3831	3790003831
1227663	D40CD-12-28	3776821075
1229097	SD64DC-7-133.12	3771434058
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1229455	SD52CC-29-72	3771532074
1229472	SD64MC-CP639-191	3799000639
1229473	SD64MC-CP652-215	3799000652
1229474	SD53CD-4-169	3771933018
1229475	SD53CC-51-151.5	3771933036
1229476	D62LB-5-80	3771421180
1237803	SD63CB-26-132.75	3771433930
1237805	D40CB-10-42	3776821106
1237807	D55DB-2-63	3771921035

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9470.604144.....	D4292	3790004292
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9470.606960.....	C3850	3790003850
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9470.630861.....	D50DD-28-39.50	3777921096
9470.634900.....	B5734	3790005734
9470.634901.....	B5736	3790005736
9470.634902.....	B5733	3790005733
9470.634903.....	B5750	3790005750
9470.634904.....	B5751	3790005751
9470.634908.....	B5757	3790005757
9470.637008.....	D50DD-23-52.75	3777921066
9470.637508.....	B5956	3790005956
9470.640884.....	C4621	3790004621

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9470.640886.....	C4536	3790004536
9470.642859.....	B6356	3790006356
9570.604120.....	D4195	3790004195
9570.604121.....	D40CC-29-26	3776821108
9570.614332.....	D45LC-3-44.25	3774121046
9570.614333.....	D35CC-27-26	3773821085
9570.614366.....	D45CC-20-46	3774121043
9570.614380.....	D45CC-20-46	3774121043
9570.617862.....	B4708	3790004708
9570.618928.....	B5780	3790005780
9570.618929.....	D45CC-7-46	3790005782
9570.619836.....	D45CC-12-44	3790005670
9570.619876.....	D30CD-9-20	3790005461
9570.619877.....	B5462	3790005462
9570.619891.....	D45CC-20-46	3774121043
9570.619980.....	B5864	3790005864
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9570.640890.....	C4537	3790004537
9570.640891.....	C4518	3790004518
9570.640892.....	C4517	3790004517
9570.640896.....	C4619	3790004619
9570.640899.....	B4874	3790004874
9570.643701.....	B5495	3790005495
9570.643704.....	B5072	3790005072
9570.643705.....	D35DD-7-17.88	3773821092
9570.643706.....	D20DD-6-6.25	3770121136
9570.643708.....	D30DD-12-9.12	3790005740
9570.643710.....	B5899	3790005899
9570.660009.....	D30CD-12-20	3775421003
9570.660011.....	B6353	3790006353
9570.660777.....	D40CC-28-46	3776821107
9570.660780.....	B6264	3790006264
9570.660781.....	D30CD-12-20	3775421003
9570.660782.....	B4708	3790004708
9570.660785.....	B6422	3790006422
9572.601047.....	D3837	3790003837
9572.601691.....	D30CL-5-24	3770521130
9572.601940A.....	C4152	3790004152
9572.604129.....	B5473	3790005473
9770.614335.....	C4404	3790004404
9770.615862.....	S64DB-10-73	3771414053
9770.640888.....	S53DB-22-63	3771513182
9830.620243.....	SD63DC-19-81	3771433946
9830.620509.....	D60BC-6-27.81	3771421256
9870.620505.....	D50CB-9-32.50	3777921067
9870.620569.....	D60CD-5-34	3771421254
9870.620645.....	D50CB-8-27	3777921058
9870.622391.....	D50CC-23-36	3777921065
9870.622392.....	D50CC-22-20	3777921064
9870.622401.....	D50CC-27-36	3777921093
9870.622402.....	D55CC-10-24.25	3771921043
9870.623499.....	D60CF-3-32.38	3771421225
9870.623992.....	D60CF-2-57	3771421223
9870.623999.....	S41LC-1-39.38	3771011057
9872.622234.....	D40CD-9-24	3776821071
9872.622235.....	D50CE-2-43.75	3777921057
9872.622236.....	D45CC-11-26.94	3774121027
9872.622238.....	D60DB-20-63	3771421215
9872.622239.....	SD53CC-25-106	3771533051
9872.622251.....	C3847	3790003847
9872.623427.....	SD75OO-2-113	3772535005
9872.623428.....	SD86OO-1-146	3772936002
9872.623445.....	SD86CC-1-171	3772936001
9872.623446.....	SD85CC-15-125	3772935003
9872.623447.....	SD84CC-11-104	3772934012
9872.623473.....	S21LL-2-1.5	3771411106
9872.624071.....	D3812	3790003812
9872.624073.....	SD74CC-11-131	3772534032

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9872.624076.....	SD85CC-19-348	3772935026
9872.624087.....	SD94CC-9-190	3773134006
9872.626002.....	SD84MC-18-176	3772934020
9872.626003.....	SD85MC-15-220	3772935023
9872.626004.....	SD85MC-16-220	3772935024
9872.627005.....	SD62CC-20-82	3771432054
9880.623829.....	SD64CC-7-132	3771434035
9970.601047.....	D3837	3790003837
9970.601691.....	D30CL-5-24	3770521130
9970.604129.....	B5473	3790005473
9970.604129A.....	B5473	3790005473
9970.604975.....	C4750	3790004750
9970.604976.....	D50DD-32-37.25.....	3777921102
9970-604129B.....	B5473	3790005473
9972.601692.....	B3803	3790003803
B5327 MTM.....	D50DD-22-40	3790005327
C4620 MTM.....	C4620	3790004620

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2-4047	SD64CB-5-80.....	3771434019
2-4048	SD64CB-5-99.....	3771434022
2-4049	SD64CB-5-113.....	3771434020
2-4050	SD64CB-5-143.....	3771434021

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080121.....	SD52DC-13-119	3771532071
1341-1	C3828	3790003828
1341-LM	C3828	3790003828
135401.....	D3827	3790003827
1354-01	D3827	3790003827
1354-LM	D3827	3790003827
2000207.....	C3828	3790003828
2000209.....	D3827	3790003827
2000213.....	C3826	3790003826
2000220.....	D52CD-79-80.....	3771521139
2000233.....	B4156	3790004156
2000306.....	B4286	3790004286
2001101.....	SD83MC-9-132	3773033005
2001103.....	SD84MC-18-152	3772934021
2001105.....	SD84MC-18-176	3772934020
2001106.....	SD85MC-15-220	3772935023
2001108.....	SD84MC-19-285	3772934023
2001109.....	SD84MC-19-340	3772934024
2001110.....	SD84MC-20-406	3772934025
2001111.....	SD85MC-16-220	3772935024
2001112.....	SD84MC-21-176	3772934026
2001113.....	SD84MC-21-152	3772934027
2001114.....	SD84MC-23-406	3772934031
2001115.....	SD95MC-5-220	3773135012
2001116.....	SD95MC-6-220	3773135013
2001120.....	SD95MC-6-220	3773135013
2001122.....	SD73CC-23-150	3772533042
2001123.....	SD63MC-11-120	3771433111
2001126.....	SD52DC-13-140	3771532072
2001129.....	SD63MC-11-139	3771433109
2001130.....	SD73CC-27-147	3772133003
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2162TM	C3826	3790003826
2162-TM	C3826	3790003826
2958-LM	D52CD-79-68	3771521138
2959-LM	D52CD-79-80	3771521139
3809-LM	B4156	3790004156
4148021.....	C4240	3790004240
4149013AA.....	D4296	3790004296
4149014AA.....	C4294	3790004294
4149023.....	B4156	3790004156
4149044.....	D52CD-79-68	3771521138
4149075.....	D45DC-2-36	3774121033
4149110.....	D35CL-2-12	3773821063

Pak-Mor Mfg

4149111.....	D40CL-4-12	3776821079
4149112.....	D25CL-2-12	3772621135
4300085.....	SD73CC-27-147	3772133003
4310085.....	SD73CC-23-150	3772533042
5762-LM	B4286	3790004286
5824-LM	C4240	3790004240
CHL 201002-B.....	C3826	3790003826
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2001102.....	SD52DC-13-140	3771532072
2001183.....	SD53CC-42-189	3771933017
4148000.....	D60CB-5-26	3771421220
4148022.....	D50DB-13-24	3777921059
4148023.....	D50DL-2-42	3777921060
4148037.....	D60CL-2-40	3771421221
4148044.....	D60CB-5-47	3771421217
4149004.....	D50CD-3-43.12.....	3777921062
4149065.....	D35LL-9-30	3773821058
4149067.....	D35LL-9-38	3773821059
4149071.....	D40CD-12-28.....	3776821075
4149073.....	D30LL-7-26.50.....	3770521094
4149131.....	D25LL-13-90	3772621130

Pioneer Tarper

H7039	D20LL-7-24	3770121134
HR4579	D15DD-4-30	3776921020

Rapid Rail

L10-00	D17AE-2-71.88	3778121003
L7-00	D30CC-20-8.00	3770521113
L8-00	D30CC-19-16.00.....	3770521111
P2300	B5789	3790005789
P23-00	D50CC-25-43	3777921075
T11-00	D30CE-11-18.50.....	3770521112

Rudco

P28-022	D62LB-5-80.....	3771421180
P28-052	D72LB-9-80.....	3772521122

Shu-Pak Refuse

807468.....	SD52DC-11-84	3771532060
808788.....	S63DC-42-82	3771413117

Smart Truck Systems

80000-1	S52DB-10-55	3771512085
800043.....	S53DB-14-78	3771513137

Stagg C+O Dempster

4AA80273.....	D35LD-1-16	3773821028
4AA80285.....	D60CC-43-96.75.....	3771421252
4AA82435.....	D60DD-18-59.75.....	3771421253
4AA90314.....	D52DD-5-40	3771521145
4CC80275.....	D40DD-2-51	3770821019
4CC80278.....	B4285	3790004285
4CC80284.....	D60DD-4-69	3771421090

Steco

68D1475.....	SD86CC-2-177	3772936004
ST-90057	SD96MC-5-456	3773136007

Truxmore

P1018	SD83CC-13-104	3773033015
P1023	SD84CC-20-144	3772934036
P1027	SD84CC-20-178	3772934035
P1032	SD85CC-9-211	3773035020

Universal Handling

16-BS-57	SD73GF-2-135.....	3772533025
16-BS-58	SD73GF-2-156.....	3772533024
D002-6411.....	SD74DC-9-109	3772534055
D002-6413.....	SD63DC-7-80	3771433070



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D002-6414.....	SD85DC-CP225-151	3799000225
M608-8000	S63DC-78-77	3771413259
M609-4000	SD73GF-2-156.....	3772533024
M609-5000 SPECIAL	SD63DC-CP195-120	3799000195
M610-4000	C4152	3790004152
M612-7000	D45DD-9-23	3774121049
M612-8000	D50DD-30-32.50.....	3777921098

Vactor / Guzzler

201313.....	SD53MC-3-120	3771533037
1200334.....	S63DC-47-107	3771413185

Vactor / Guzzler

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1201552.....	SD63DB-14-120.....	3771433104
1201560.....	SD63MC-9-130	3771433062
1202110.....	SD84MC-21-176.....	3772934026
N1201313.....	SD53MC-3-120	3771533037

Walinga

59-80634-6	D35DD-4-24.75	3773821064
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Wayne Engineering

00-29781-03-WB	SD64MC-CP639-191	3799000639
00-29781-13-WB	SD64MC-CP639-191	3799000639
00-29781-23-WB	SD64MC-CP639-191	3799000639
00-29781-33-WB	SD64MC-CP639-191	3799000639
00-29781-43-WB	SD64MC-CP639-191	3799000639
00-29781-53-AB	SD64MC-CP639-191	3799000639
00-29781-71-AB	SD64MC-CP652-215	3799000652
00-29781-73-AB	SD64MC-CP639-191	3799000639
00-29781-X1-AB	SD64MC-CP652-215	3799000652
00-29781-X3-AB	SD64MC-CP639-191	3799000639
00-33700-31-AB	SD64MC-CP652-215	3799000652
17636-001	SD32CC-2-63	3770732002
27087-03 WB.....	SD64MC-CP639-191	3799000639
29781-23 WB.....	SD64MC-CP639-191	3799000639
29781-71-AB	SD64MC-CP652-215	3799000652
WB-08535-05	SD42CC-11-78	3771032013
WB-24069-01	SD64MC-CP652-215	3799000652
WB-24069-03	SD64MC-CP639-191	3799000639
WB-27087-01	SD64MC-CP652-215	3799000652
WB-27087-03	SD64MC-CP639-191	3799000639
WB-29781-23	SD64MC-CP639-191	3799000639
WC-17525-01	D45CL-13-10	3773621017
WC-17583-01	D35CC-12-28.25.....	3773821035

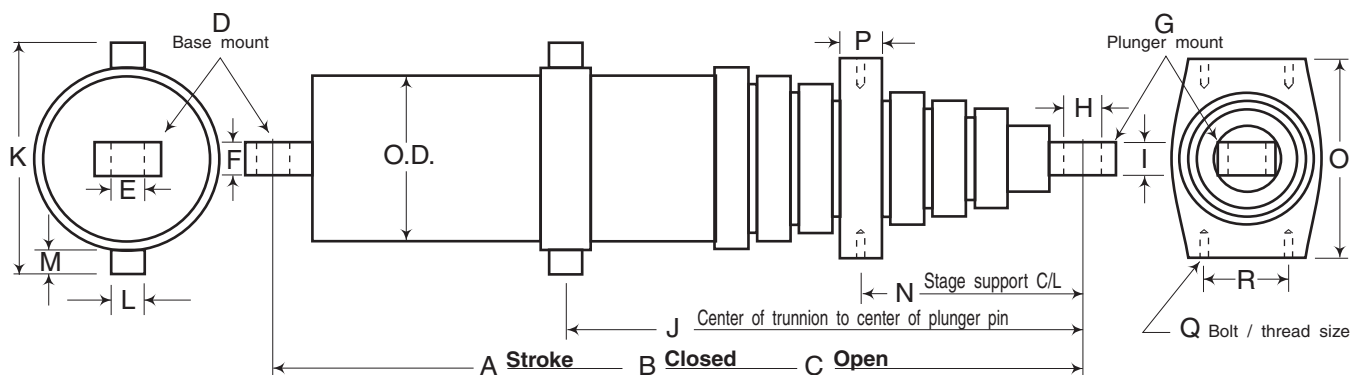
Wittke Waste

014-0208	D35CD-11-19	3773821068
022-9000	B5545.....	3790005545
022-9900	B5545.....	3790005545
095-6024	SD53CD-3-156.88	3771933019
100-14-1610.....	D30DD-16-16.00.....	3770521118
110121-2	D25LL-9-36	3772621124
AUHC-04	D15DD-3-66	3776921019
AUHC-06	D20DD-7-12.00	3770121137
AUHC-07	D20CC-6-4	3770121131
AUHC-08	D50CC-21-18.50.....	3777921063
AUHC-09	D30DC-2-17.38	3770521097
E0302160	D35CD-11-19	3773821068
FL7-A066.....	D35CD-11-19	3773821068
FL7-A067.....	SD53CD-3-134.50	3771933030
FL7-A116.....	SD53CD-3-156.88	3771933019
FL7-A117.....	SD53CD-3-168	3771933012
FL7-A117W	SD53CD-3-168	3771933012
FL7-A118.....	SD53CD-3-185.75	3771533089
FL7-A118W	SD53CD-3-185.75	3771533089
FL7-A123.....	SD53CD-3-134.50	3771933030
FL7-A123W	SD53CD-3-134.50	3771933030
FL7-A125.....	SD53CD-3-156.88	3771933019

Wittke Waste

FL7-A125W	SD53CD-3-156.88	3771933019
FLHC-02	B5545.....	3790005545
FLHC-06	S53DB-25-72	3771513188
FLHC-07	SD53CD-3-156.88	3771933019
FLHC-08	SD53CD-3-168	3771933012
FLHC-18.....	SD53CD-3-156.88	3771933019
FLHC-19.....	SD53CD-3-168	3771933012
FLHC-20.....	SD53CD-3-185.75	3771533089
FLHC-24.....	B5545.....	3790005545
FLHC-25.....	D25LL-14-42	3772621131
FLHC-26A.....	B5547.....	3790005547
FLHC-26B.....	D40CL-13-45.38	3776821120
FLHC-26C	D45LD-7-45.38	3774121032
FLHC-27.....	D35LD-5-19	3773821057
FLHC-27A.....	D35LD-5-19	3773821057
FLHC-28.....	B5549.....	3790005549
FLHC-28C.....	D45LD-7-45.38	3774121032
FLHC-29.....	D25LL-9-36	3772621124
FLHC-30.....	SD53CD-3-156.88	3771933019
FLHC-31	SD53CD-3-168	3771933012
FLHC-32.....	SD53CD-3-185.75	3771533089
FLHC-33.....	D25LL-15-71.50	3772621134
FLHC-34.....	D25LL-15-84	3772621133
FLHC-35.....	B5772.....	3790005772
FLHC-36.....	S53DB-25-72	3771513188
FLHC-42.....	D30DD-16-16.00.....	3770521118
H10-0273.....	D30DC-3-17.38.....	3770521136
MLHC-02.....	D50DD-25-40.....	3777921079
ROHC-03.....	B5732.....	3790005732
SM2-22-1.5-66.....	D15DD-3-66.....	3776921019

Telescopic Cylinder Application Data Form



Cylinder application _____

Single- or Double-acting _____ System operating pressure Normal _____ Max. _____

O.D. of body _____ Is there a relief valve in system _____ Setting _____

O.D. largest moving stage _____ System flow in G.P.M Min. _____ Max. _____

Number of moving stages _____ System operating temp. Normal _____ Max. _____

Chrome or non-chrome stages _____ Fluid type _____

Mounting conditions _____ Vert. _____ Horiz. _____ Incline angle _____ Load holding requirements _____

Any side or eccentric loading possible _____ Environmental condition _____

A : Total stroke _____ J : Plunger pin to trunnion C/L (if applicable) _____

B : Closed length _____ K : Trunnion overall width _____

C : Open length _____ L : Trunnion lug diameters _____

D : Base mount type or code _____ M : Trunnion lug lengths _____

E : Base pin diameter _____ N : Plunger pin to stage support (if applicable) _____

F : Base mount width _____ O : Stage support width _____

G : Plunger mount type or code _____ P : Stage support thickness _____

H : Plunger pin diameter _____ Q : Stage support bolt & thread size _____

I : Plunger mount width _____ R : Stage support bolt locations & C/L's _____

Special mounting (if applicable) _____

Extend port size and type _____ Extend port location _____

Retract port size and type _____ Retract port location _____

Special features or comments _____

Requested by: Firm _____ Current Quan. _____

Address _____ Future Quan. _____

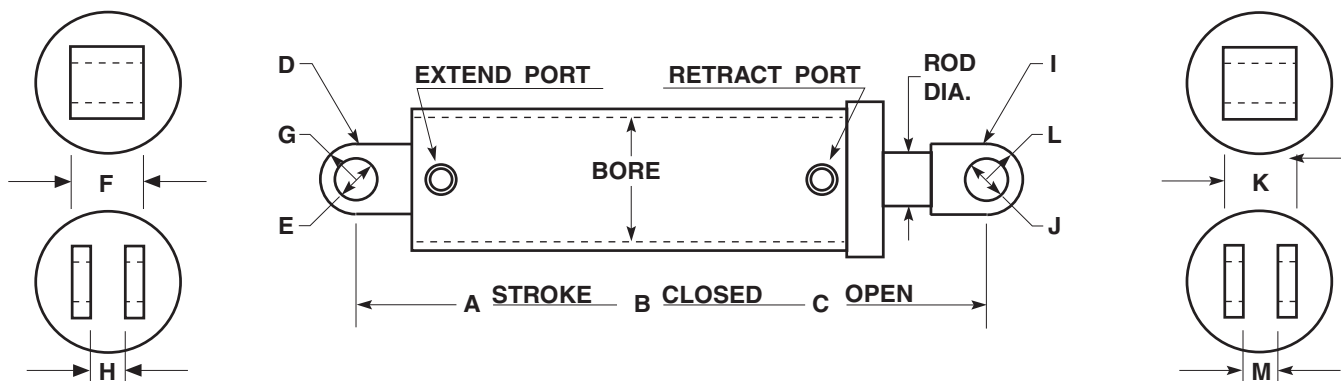
City _____ State _____ Zip _____

Phone _____ Fax _____

Contact _____

Phone: (800) 848-5575 * 330-480-8431 * Fax (800) 694-3392 * 330-480-8432

Piston Rod Cylinder Application Data Form



Cylinder application _____

Single- or Double-acting _____ System operating pressure Normal ____ Max. ____

Bore _____ Is there a relief valve in system ____ Setting ____

Rod diameter _____ System flow in G.P.M. Min. ____ Max. ____

Head & gland design _____ System operating temp. Normal ____ Max. ____

Piston design _____ Fluid type _____

Mounting conditions ____ Vert. ____ Horz. ____ Incline angle ____ Load holding requirements _____

Any side or eccentric loading possible _____ Environmental condition _____

A : Total stroke _____

B : Closed length _____

C : Open length _____

D : Base mount type or code _____

E : Base pin diameter _____

F : Base mount width _____

G : Base mount radius _____

H : Base Clevis Gap (if applicable) _____

I : Plunger mount type or code _____

J : Plunger pin diameter _____

K : Plunger mount width _____

L : Plunger mount radius _____

M : Plunger clevis gap (if applicable) _____

Special mounting (if applicable) _____

Extend port size and type _____ Extend port location _____

Retract port size and type _____ Retract port location _____

Special features or comments _____

Requested by: Firm _____ Current Quan. _____

Address _____ Future Quan. _____

City _____ State _____ Zip _____

Phone _____ Fax _____

Contact _____

Phone: (800) 848-5575 * 330-480-8431 * Fax (800) 694-3392 * 330-480-8432

Storage and Installation

STORAGE

It pays to keep spare hydraulic cylinders on hand for use when you need them. But, you must know and follow these recommended storage practices or the cylinders can be ruined. Hydraulic cylinders, though often large and unwieldy, are precision machines with finely finished parts and close tolerances. And they're expensive. So handle them with care.

For optimum storage life, hydraulic cylinders should be kept in an environment that is protected from excessive moisture and temperature extremes. A hot, dry desert climate with cold nights, for example, must be accommodated when choosing the storage area. Daytime heat quickly bakes oil out of sealing materials, which causes leaks and rapid wear when the cylinder is placed in service. Cooling at night causes water condensation and corrosion damage to wear surfaces. Storage areas that allow exposure to rain, snow and extreme cold must like wise be avoided.

It's best to store cylinders indoors if possible. But indoors or out, be sure that plugs or closures are properly installed in all ports to keep out moisture and dirt. However, overtightening of port plugs should be avoided. Widely varying temperatures and tightly closed ports may cause pressure inside the cylinder to build up to the point where the piston moves far enough to expose the rod to corrosion or contamination. Try to choose a storage location where the cylinders are protected from physical damage. Even a little ding from a falling bar or forklift tine can cause trouble later.

Cylinders, Particularly large ones, should be stored closed in a vertical position with the rod end down. Be sure they're blocked securely to keep them from toppling. Storing with the rod ends down keeps oil on the seals, which protects them from drying out. This is more critical with fabric and butyl seals than with urethane sealing materials. Storing single-acting cylinders with the rod end up can cause port closures to pop open and leak, exposing the sleeves to corrosion damage and contamination. Storing with the rod end down also discourages the temptation to lift a cylinder by the rod eye – a dangerous practice. If horizontal storage cannot be avoided, the rod or cylinder should be rolled into a new position every two months or so to prevent drying, distortion and deterioration of the seals. Don't forget that a cylinder can be a major source of contamination. A small scratch or nick on the sleeve will quickly shred packing and contaminate the system. Store cylinders carefully and keep them clean.

The following procedures should be followed in order to prevent oxidation and maintain the surfaces of a mounted hydraulic cylinder during idle periods. These idle periods may include; inventory units, demo units, out of service units, etc.

- All machined surfaces left expose should be coated with a light film of grease, if not oxidation will occur.
- If oxidation is present, apply a light coat of oil to the surfaces.
- Buff surfaces with 320 or 400 grit sandpaper. Do not buff surfaces up and down the length, buff only around the circumference.
- If after buffing, the surfaces show evidence of oxidation damage i.e., pitting, the cylinder should be inspected by an authorized service center for evaluation.
- Operation of a hydraulic cylinder with surface damage will shorten the longevity and preclude any warranty express or implied.

INSTALLATION

• Cleanliness is an important consideration, and Parker cylinders are shipped with the ports plugged to protect them from contaminants entering the ports. These plugs should not be removed until the piping is to be installed. Before making the connection to the cylinder ports, the piping should be thoroughly cleaned to remove all chips or burrs which might have resulted from threading or flaring operations. One small foreign particle can cause premature failure of the cylinder or other hydraulic system components. If oxidation is present, apply a light coat of oil to the surfaces.

• Proper alignment of the cylinder piston rod and its mating component on the machine should be checked in both the extended and retracted positions. Improper alignment will result in excessive rod gland and/or cylinder bore wear.

• Cylinders operating in an environment where air drying material are present such as fast- drying chemicals, paint, or welding splatter, or other hazardous conditions such as excessive heat, should have shields installed to prevent damage to the piston rod and piston rod seals.

Parker Safety Guide for Selecting and Using Hydraulic Cylinders and Their Accessories

WARNING:  FAILURE OR IMPROPER SELECTION OR IMPROPER USE OF CYLINDERS AND THEIR RELATED ACCESSORIES CAN CAUSE DEATH, PERSONAL INJURY AND PROPERTY DAMAGE.

Before selecting or using Parker cylinders or related accessories, it is important that you read, understand and follow the following safety information.

User Responsibility

Due to very wide variety of cylinder applications and cylinder operating conditions, Parker does not warrant that any particular cylinder is suitable for any specific application. This safety guide does not analyze all technical parameters that must be considered in selecting a product. The hydraulic and pneumatic cylinders outlined in this catalog are designed to Parker's design guide lines and do not necessarily meet the design guide lines of other agencies such as American Bureau of Shipping, ASME Pressure Vessel Code etc. The user, through its own analysis and testing, is solely responsible for:

- Making the final selection of the cylinders and related accessories.
- Determining if the cylinders are required to meet specific design requirements as required by the Agency(s) or industry standards covering the design of the user's equipment.
- Assuring that the user's requirements are met, OSHA requirements are met, and safety guidelines from the applicable agencies such as but not limited to ANSI are followed and that the use presents no health or safety hazards.
- Providing all appropriate health and safety warnings on the equipment on which the cylinders are used.

Seals

The seals for the product lines shown in this catalogue are intended for mineral base hydraulic fluids and for the operating temperatures ranges as indicated. The operation of these products with other fluids or at other operating temperatures must be brought to the attention of our engineering department so that proper seals for intended operation may be selected.

The application of cylinders may allow fluids such as cutting fluids, wash down fluids etc. to come in contact with the external area of the cylinder. These fluids may attack the piston rod wiper and or the primary seal and must be taken into account when selecting and specifying seal compounds.

Dynamic seals will wear. The rate of wear will depend on many operating factors. Wear can be rapid if a cylinder is mis-aligned or if the cylinder has been improperly serviced. The user must take seal wear into consideration in the application of cylinders.

Piston Rods

Possible consequences of piston rod failure or separation of the piston rod from the piston include, but are not limited to are:

- Piston rod and or attached load thrown off at high speed.
- High velocity fluid discharge.
- Piston rod extending when pressure is applied in the piston retract mode.

Piston rods or machine members attached to the piston rod may move suddenly and without warning as a consequence of other conditions occurring to the machine such as, but not limited to:

- Unexpected detachment of the machine member from the piston rod.
- Failure of the pressurized fluid delivery system (hoses, fittings, valves, pumps, compressors) which maintain cylinder position.
- Catastrophic cylinder seal failure leading to sudden loss of pressurized fluid.
- Failure of the machine control system.

Part of selecting cylinders for a specific operation involves the proper selection of the piston rod diameter. This catalogue contains information in the selection of piston rod diameter, which must be followed in order to avoid possible buckling.

Piston rods are not normally designed to absorb bending moments or loads which are perpendicular to the axis of piston rod motion. These additional loads can cause the piston rod to fail. If these types of additional loads are expected to be imposed on the piston rod, their magnitude should be made known to our engineering department.

The cylinder user should always make sure that the piston rod is securely attached to the machine member.

Cushions

Cushions are devices internal to the cylinder to slow the piston and rod assembly down at the end of the stroke. It is suggested they be used to reduce piston impact at the end of the cylinder stroke when the cylinder is expected to move at relatively high velocity.

Cylinder cushions are normally designed to absorb the energy of a linear applied load. A rotating mass has considerably more energy than the same mass moving in a linear mode. Cushioning for a rotating mass application should be review by our engineering department.

Cylinder Mountings

Some cylinder mounting configurations may have certain limitations such as but not limited to minimum stroke for side or foot mounting cylinders or pressure de-ratings for certain flange mounts. Carefully review the catalog for these types of restrictions.

Always mount cylinders using the largest possible high tensile alloy steel socket head cap screws that can fit in the cylinder mounting holes and torque them to the manufacturer's recommendations for their size.

Port Fittings

Hydraulic cylinders applied with meter out or deceleration circuits are subject to intensified pressure at piston rod end.

The rod end pressure is approximately equal to:

$$\frac{\text{operating pressure} \times \text{effective cap end area}}{\text{effective rod end piston area}}$$

Contact your connector supplier for the pressure rating of individual connectors.

Cylinder Modifications or Repairs

Cylinders as shipped from the factory are not to be disassembled and or modified. If cylinders require modifications, these modifications must be done at Parker locations or by Parker certified facilities. The Mobile Cylinder Division Engineering Department must be notified in the event of a mechanical fracture or permanent deformation of any cylinder component (excluding seals). This includes a broken piston rod, mounting accessory or any other cylinder component. This notification should include all operation and application details. This information will be used to provide an engineered repair that will prevent recurrence of the failure. It is allowed to disassemble cylinders for the purpose of replacing seals or seal assemblies.

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The items described in this document and other documents and descriptions provided by Parker Hannifin Corporation, its subsidiaries and its authorized distributors ("Seller") are hereby offered for sale at prices to be established by Seller. This offer and its acceptance by any customer ("Buyer") shall be governed by all of the following Terms and Conditions. Buyer's order for any item described in its document, when communicated to Seller verbally, or in writing, shall constitute acceptance of this offer. All goods or work described will be referred to as "Products".

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9. **Loss to Buyer's Property.** Any designs, tools, patterns, materials, drawings, confidential information or equipment furnished by Buyer or any other items which become Buyer's property, may be considered obsolete and may be destroyed by Seller after two consecutive years have elapsed without Buyer placing an order for the items which are manufactured using such property. Seller shall not be responsible for any loss or damage to such property while it is in Seller's possession or control.
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11. **Buyer's Obligation; Rights of Seller.** To secure payment of all sums due or otherwise, Seller shall retain a security interest in the goods delivered and this agreement shall be deemed a Security Agreement under the Uniform Commercial Code. Buyer authorizes Seller as its attorney to execute and file on Buyer's behalf all documents Seller deems necessary to perfect its security interest. Seller shall have a security interest in, and lien upon, any property of Buyer in Seller's possession as security for the payment of any amounts owed to Seller by Buyer.
12. **Improper use and Indemnity.** Buyer shall indemnify, defend, and hold Seller harmless from any claim, liability, damages, lawsuits, and costs (including attorney fees), whether for personal injury, property damage, patent, trademark or copyright infringement or any other claim, brought by or incurred by Buyer, Buyer's employees, or any other person, arising out of: (a) improper selection, improper application or other misuse of Products purchased by Buyer from Seller; (b) any act or omission, negligent or otherwise, of Buyer; (c) Seller's use of patterns, plans, drawings, or specifications furnished by Buyer to manufacture Product; or (d) Buyer's failure to comply with these terms and conditions. Seller shall not indemnify Buyer under any circumstance except as otherwise provided.
13. **Cancellations and Changes.** Orders shall not be subject to cancellation or change by Buyer for any reason, except with Seller's written consent and upon terms that will indemnify, defend and hold Seller harmless against all direct, incidental and consequential loss or damage. Seller may change product features, specifications, designs and availability with notice to Buyer.
14. **Limitation on Assignment.** Buyer may not assign its rights or obligations under this agreement without the prior written consent of Seller.
15. **Entire Agreement.** This agreement contains the entire agreement between the Buyer and Seller and constitutes the final, complete and exclusive expression of the terms of the agreement. All prior or contemporaneous written or oral agreements or negotiations with respect to the subject matter are herein merged.
16. **Waiver and Severability.** Failure to enforce any provision of this agreement will not waive that provision nor will any such failure prejudice Seller's right to enforce that provision in the future. Invalidation of any provision of this agreement by legislation or other rule of law shall not invalidate any other provision herein. The remaining provisions of this agreement will remain in full force and effect.
17. **Termination.** This agreement may be terminated by Seller for any reason and at any time by giving Buyer thirty (30) days written notice of termination. In addition, Seller may by written notice immediately terminate this agreement for the following: (a) Buyer commits a breach of any provision of this agreement (b) the appointment of a trustee, receiver or custodian for all or any part of Buyer's property (c) the filing of a petition for relief in bankruptcy of the other Party on its own behalf, or by a third party (d) an assignment for the benefit of creditors, or (e) the dissolution or liquidation of the Buyer.
18. **Governing Law.** This agreement and the sale and delivery of all Products hereunder shall be deemed to have taken place in and shall be governed and construed in accordance with the laws of the State of Ohio, as applicable to contracts executed and wholly performed therein and without regard to conflicts of laws principles. Buyer irrevocably agrees and consents to the exclusive jurisdiction and venue of the courts of Cuyahoga County, Ohio with respect to any dispute, controversy or claim arising out of or relating to this agreement. Disputes between the parties shall not be settled by arbitration unless, after a dispute has arisen, both parties expressly agree in writing to arbitrate the dispute.
19. **Indemnity for Infringement of Intellectual Property Rights.** Seller shall have no liability for infringement of any patents, trademarks, copyrights, trade dress, trade secrets or similar rights except as provided in this Section. Seller will defend and indemnify Buyer against allegations of infringement of U.S. patents, U.S. trademarks, copyrights, trade dress and trade secrets ("Intellectual Property Rights"). Seller will defend at its expense and will pay the cost of any settlement or damages awarded in an action brought against Buyer based on an allegation that a Product sold pursuant to this Agreement infringes the Intellectual Property Rights of a third party. Seller's obligation to defend and indemnify Buyer is contingent on Buyer notifying Seller within ten (10) days after Buyer becomes aware of such allegations of infringement, and Seller having sole control over the defense of any allegations or actions including all negotiations for settlement or compromise. If a Product is subject to a claim that it infringes the Intellectual Property Rights of a third party, Seller may, at its sole expense and option, procure for Buyer the right to continue using the Product, replace or modify the Product so as to make it noninfringing, or offer to accept return of the Product and return the purchase price less a reasonable allowance for depreciation. Notwithstanding the foregoing, Seller shall have no liability for claims of infringement based on information provided by Buyer, or directed to Products delivered hereunder for which the designs are specified in whole or part by Buyer, or infringements resulting from the modification, combination or use in a system of any Product sold hereunder. The foregoing provisions of this Section shall constitute Seller's sole and exclusive liability and Buyer's sole and exclusive remedy for infringement of Intellectual Property Rights.
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Parker Hannifin Corporation

About Parker Hannifin Corporation

Parker Hannifin is a leading global motion-control company dedicated to delivering premier customer service. A Fortune 500 corporation listed on the New York Stock Exchange (PH), our components and systems comprise over 1,400 product lines that control motion in some 1,000 industrial and aerospace markets. Parker is the only manufacturer to offer its customers a choice of hydraulic, pneumatic, and electromechanical motion-control solutions. Our Company has the largest distribution network in its field, with over 7,500 distributors serving nearly 400,000 customers worldwide.

Parker's Charter

To be a leading worldwide manufacturer of components and systems for the builders and users of durable goods. More specifically, we will design, market and manufacture products controlling motion, flow and pressure. We will achieve profitable growth through premier customer service.

Product Information

North American customers seeking product information, the location of a nearby distributor, or repair services will receive prompt attention by calling the Parker Product Information Center at our toll-free number: 1-800-C-PARKER (1-800-272-7537). In Europe, call 00800-C-PARKER-H (00800-2727-5374).

The Aerospace Group

is a leader in the development, design, manufacture and servicing of control systems and components for aerospace and related high-technology markets, while achieving growth through premier customer service.



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designs, manufactures and markets system-control and fluid-handling components and systems to refrigeration, air-conditioning and industrial customers worldwide.



The Fluid Connectors Group

designs, manufactures and markets rigid and flexible connectors, and associated products used in pneumatic and fluid systems.



The Seal Group designs, manufactures and distributes industrial and commercial sealing devices and related products by providing superior quality and total customer satisfaction.



The Hydraulics Group

designs, produces and markets a full spectrum of hydraulic components and systems to builders and users of industrial and mobile machinery and equipment.



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designs, manufactures and markets quality filtration and clarification products, providing customers with the best value, quality, technical support, and global availability.



The Automation Group is a leading supplier of pneumatic and electromechanical components and systems to automation customers worldwide.



The Instrumentation Group is a global leader in the design, manufacture and distribution of high-quality critical flow components for worldwide process instrumentation, ultra-high-purity, medical and analytical applications.





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The user, through its own analysis and testing, is solely responsible for making the final selection of the system and components and assuring that all performance, endurance, maintenance, safety and warning requirements of the application are met. The user must analyze all aspects of the application, follow applicable industry standards, and follow the information concerning the product in the current product catalog and in any other materials provided from Parker or its subsidiaries or authorized distributors.

To the extent that Parker or its subsidiaries or authorized distributors provide component or system options based upon data or specifications provided by the user, the user is responsible for determining that such data and specifications are suitable and sufficient for all applications and reasonably foreseeable uses of the components or systems.

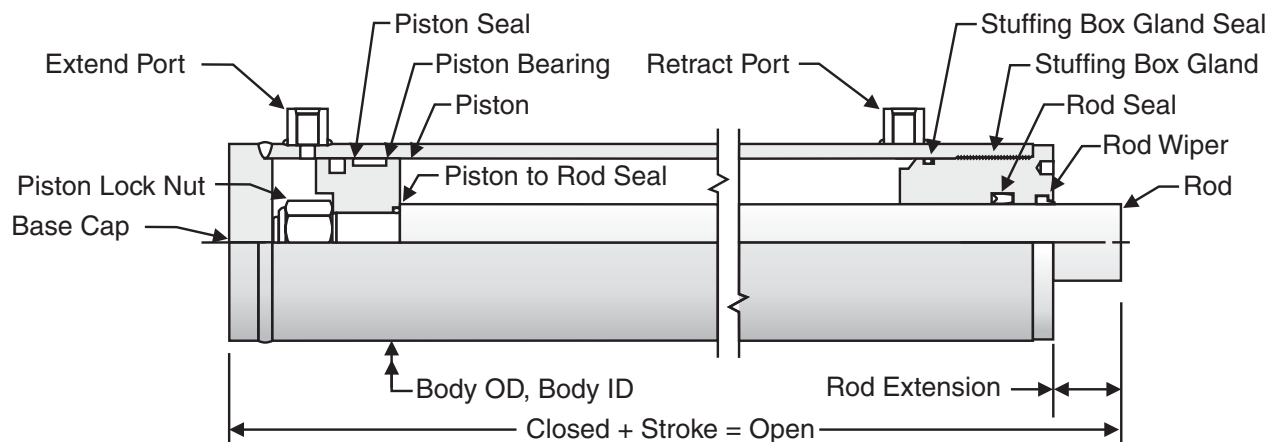
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WMD Series, 2500 PSI



Standard Construction:

Pressure Rating: 2500 p.s.i.

Standard Operating Temperature Range: -10° F (-23° C) to +165° F (+74° C).

Standard Seals Suited for operation with mineral base hydraulic fluid.

Body / Main Barrel Material: High strength steel tubing per ASTM 513 with a minimum Yield Strength of 75,000 p.s.i., finished to a maximum 16 micro-inch finish for long seal life.

Piston Rod Material, Standard: Medium carbon steel with a minimum Yield Strength of 100,000 p.s.i. (4.50" dia. Rod slightly lower). Case hardened to a minimum of 50 Rockwell C scale to prevent accidental damage. Hard chrome plated and polished to 10 RMS to provide long seal life.

Stuffing Box / Gland: Gland constructed of high strength ductile iron, Buttress Thread Design.

Piston: One-piece, pilot fitted, ductile iron material. Secured to the rod by an elastic lock nut to insure a positive connection.

Optional Nitrated Bar Rod Material, "N" Code: Steel bar with a minimum 75,000 p.s.i. Yield Strength to 16 RMS and processed for corrosion resistance.

Optional Stainless Steel Rod Material, "S" Code: High strength stainless steel which provides both high strength and corrosion resistance.

Standard Seals:

Rod Seal: Polyurethane for long seal life.

Rod Wiper: Polyurethane with double lip design to help in sealing and providing excellent exclusion protection.

Piston Seal: Buna-N energized bronze filled Teflon slide ring.

Bearings: Wear band bearings provide side load protection. Internally lubricated, heat stabilized, glass filled nylon.

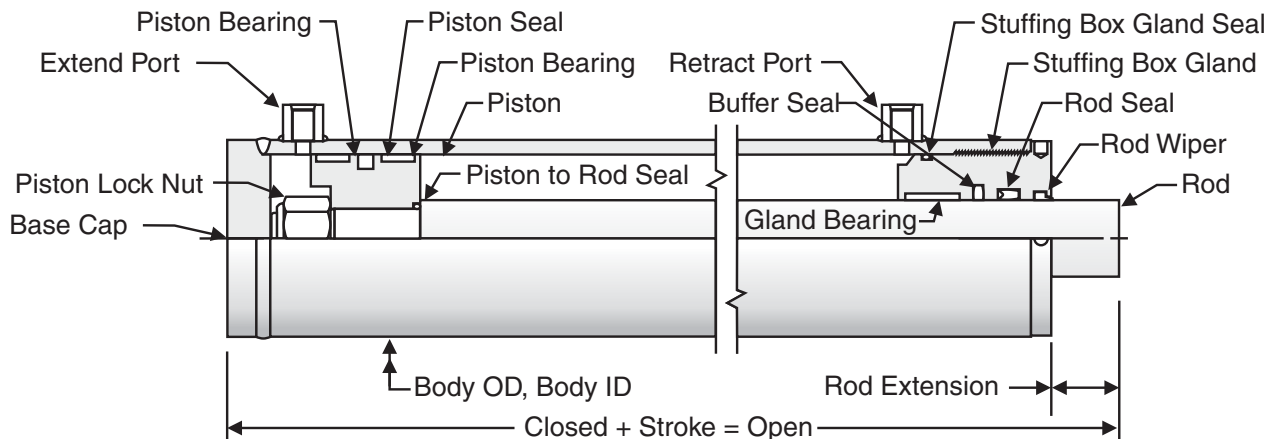
O-Rings: Buna-N

Back Up Ring: Nitrile

Optional Seals for Special Fluids and Abnormal Temperatures: Contact Factory for High Temperature (Fluorocarbon), Low Temperature (Special Nitrile), Water, Water-Glycol and Phosphatate Ester (E.P.R.) Seals.

All of our cylinders utilize the latest in seal design. Seals are one of the most critical components in a hydraulic cylinder. It is very important to keep the nearby operating environment as clean as possible and to keep the oil as contaminant free as possible.

WHD Series, 3000 PSI



Standard Construction:

Pressure Rating: 3000 p.s.i.

Standard Operating Temperature Range: -10° F (-23° C) to +165° F (+74° C).

Standard Seals Suited for operation with mineral base hydraulic fluid.

Body / Main Barrel Material: High strength steel tubing per ASTM 513 with a minimum Yield Strength of 75,000 p.s.i., finished to a maximum 16 micro-inch finish for long seal life.

Piston Rod Material, Standard: Medium carbon steel with a minimum Yield Strength of 100,000 p.s.i. (4.50" dia. Rod slightly lower). Case hardened to a minimum of 50 Rockwell C scale to prevent accidental damage. Hard chrome plated and polished to 10 RMS to provide long seal life.

Stuffing Box / Gland: Gland constructed of high strength ductile iron, Buttress Thread Design.

Piston: One-piece, pilot fitted, ductile iron material. Secured to the rod by an elastic lock nut to insure a positive connection.

Optional Nitrated Rod Material, "N" Code: Steel bar with a minimum 75,000 p.s.i. Yield Strength to 16 RMS and processed for corrosion resistance.

Optional Stainless Steel Rod Material, "S" Code: High strength stainless steel which provides both high strength and corrosion resistance.

Standard Seals:

Rod Seal: Polyurethane for long seal life.

Rod Wiper: Polyurethane with double lip design to help in sealing and providing excellent exclusion protection.

Rod Buffer (std): Premier Grade Urethane, Buffer seal acts as the primary seal to limit pressure at the Rod Seal.

Piston Seal: Buna-N energized bronze filled Teflon slide ring.

Bearings: Wear band bearings provide side load protection. Internally lubricated, heat stabilized, glass filled nylon.

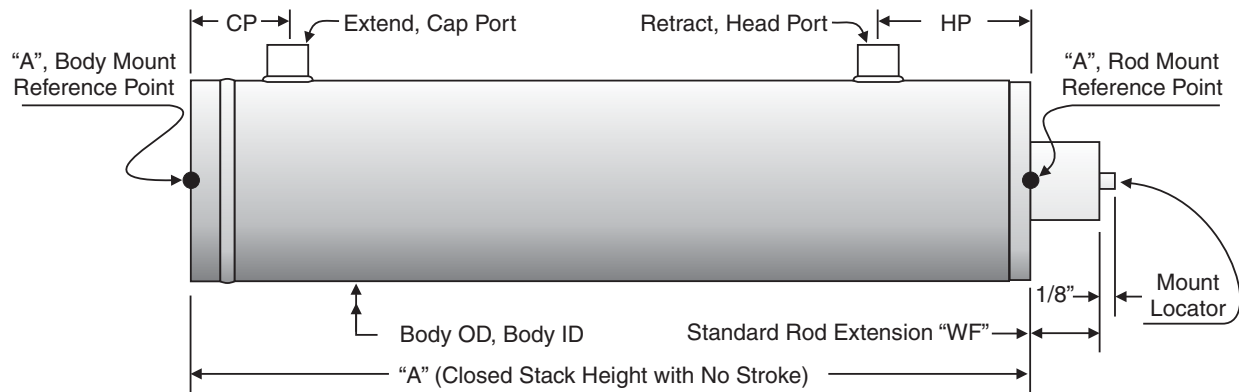
O-Rings: Buna-N

Back Up Ring: Nitrile

Optional Seals for Special Fluids and Abnormal Temperatures: Contact Factory for High Temperature (Fluorocarbon), Low Temperature (Special Nitrile), Water, Water-Glycol and Phosphatate Ester (E.P.R.) Seals.

All of our cylinders utilize the latest in seal design. Seals are one of the most critical components in a hydraulic cylinder. It is very important to keep the nearby operating environment as clean as possible and to keep the oil as contaminant free as possible.

Main Barrel and Rod Coding



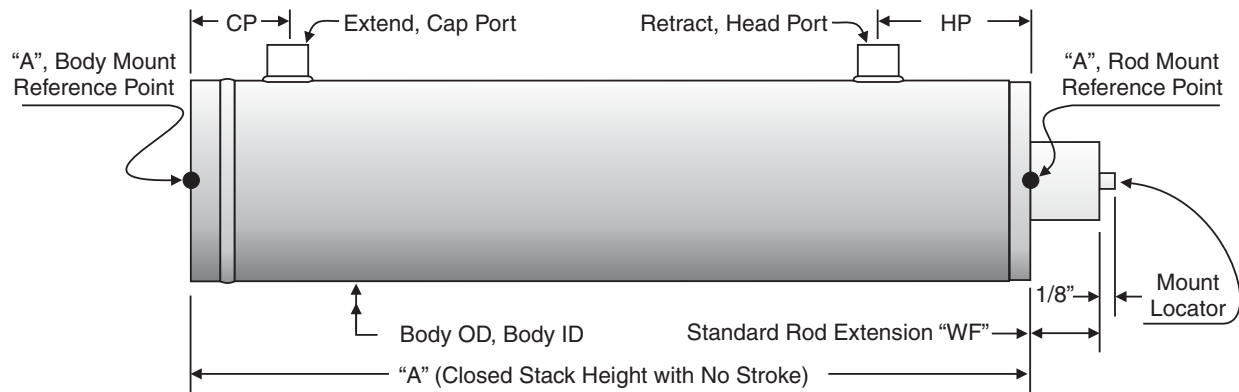
Bore Code	Body Bore and O.D. Diameter	Rod Diameter	Rod Code	WMD Series					WHD Series				
				A	Std. WF	Ports			A	Std. WF	Ports		
						Size	CP	HP			Size	CP	HP
20	2.00" ID x 2.50" OD	1.00"	10	4.62"	0.88"	#6 SAE	1.12"	2.25"	N/A	N/A	N/A	N/A	N/A
		1.125"	11	4.62"	0.88"	#6 SAE	1.12"	2.25"	N/A	N/A	N/A	N/A	N/A
		1.25"	12	4.62"	0.88"	#6 SAE	1.12"	2.25"	N/A	N/A	N/A	N/A	N/A
25	2.50" ID x 3.00" OD	1.00"	10	5.00"	0.88"	#6 SAE	1.25"	2.56"	N/A	N/A	N/A	N/A	N/A
		1.125"	11	5.00"	0.88"	#6 SAE	1.25"	2.56"	N/A	N/A	N/A	N/A	N/A
		1.25"	12	5.00"	0.88"	#6 SAE	1.25"	2.56"	N/A	N/A	N/A	N/A	N/A
		1.375"	13	5.00"	0.88"	#6 SAE	1.25"	2.56"	N/A	N/A	N/A	N/A	N/A
		1.50"	15	5.00"	0.88"	#6 SAE	1.25"	2.56"	N/A	N/A	N/A	N/A	N/A
		1.75"	17	5.00"	0.88"	#6 SAE	1.25"	2.56"	N/A	N/A	N/A	N/A	N/A
30	3.00" ID x 3.50" OD	1.00"	10	5.31"	0.88"	#6 SAE	1.37"	2.56"	N/A	N/A	N/A	N/A	N/A
		1.125"	11	5.31"	0.88"	#6 SAE	1.37"	2.56"	N/A	N/A	N/A	N/A	N/A
		1.25"	12	5.31"	0.88"	#6 SAE	1.37"	2.56"	N/A	N/A	N/A	N/A	N/A
		1.375"	13	5.31"	0.88"	#6 SAE	1.37"	2.56"	6.38"	0.88"	#6 SAE	1.50"	2.88"
		1.50"	15	5.31"	0.88"	#6 SAE	1.37"	2.56"	6.38"	0.88"	#6 SAE	1.50"	2.88"
		1.75"	17	5.31"	0.88"	#6 SAE	1.37"	2.56"	6.38"	0.88"	#6 SAE	1.50"	2.88"
		2.00"	20	5.31"	0.88"	#6 SAE	1.37"	2.56"	6.38"	0.88"	#6 SAE	1.50"	2.88"
32	3.25" I.D. x 3.75" O.D.	1.25"	12	5.44"	0.88"	#8 SAE	1.50"	2.56"	6.56"	0.88"	#8 SAE	1.62"	2.88"
		1.375"	13	5.44"	0.88"	#8 SAE	1.50"	2.56"	6.56"	0.88"	#8 SAE	1.62"	2.88"
		1.50"	15	5.44"	0.88"	#8 SAE	1.50"	2.56"	6.56"	0.88"	#8 SAE	1.62"	2.88"
		1.75"	17	5.44"	0.88"	#8 SAE	1.50"	2.56"	6.56"	0.88"	#8 SAE	1.62"	2.88"
		2.00"	20	5.44"	0.88"	#8 SAE	1.50"	2.56"	6.56"	0.88"	#8 SAE	1.62"	2.88"
35	3.50" ID x 4.00" OD	1.25"	12	5.69"	0.88"	#8 SAE	1.50"	2.81"	6.69"	0.88"	#8 SAE	1.75"	2.88"
		1.375"	13	5.69"	0.88"	#8 SAE	1.50"	2.81"	6.69"	0.88"	#8 SAE	1.75"	2.88"
		1.50"	15	5.69"	0.88"	#8 SAE	1.50"	2.81"	6.69"	0.88"	#8 SAE	1.75"	2.88"
		1.75"	17	5.69"	0.88"	#8 SAE	1.50"	2.81"	6.69"	0.88"	#8 SAE	1.75"	2.88"
		2.00"	20	5.69"	0.88"	#8 SAE	1.50"	2.81"	6.69"	0.88"	#8 SAE	1.75"	2.88"
		2.50"	25	5.69"	0.88"	#8 SAE	1.50"	2.81"	6.69"	0.88"	#8 SAE	1.75"	2.88"
40	4.00" ID x 4.62" OD	1.375"	13	5.81"	0.88"	#8 SAE	1.62"	2.81"	7.31"	0.88"	#8 SAE	1.88"	3.38"
		1.50"	15	5.81"	0.88"	#8 SAE	1.62"	2.81"	7.31"	0.88"	#8 SAE	1.88"	3.38"
		1.75"	17	5.81"	0.88"	#8 SAE	1.62"	2.81"	7.31"	0.88"	#8 SAE	1.88"	3.38"
		2.00"	20	5.81"	0.88"	#8 SAE	1.62"	2.81"	7.31"	0.88"	#8 SAE	1.88"	3.38"
		2.50"	25	5.81"	0.88"	#8 SAE	1.62"	2.81"	7.31"	0.88"	#8 SAE	1.88"	3.38"
		3.00"	30	5.81"	0.88"	#8 SAE	1.62"	2.81"	7.31"	0.88"	#8 SAE	1.88"	3.38"

Standard Build Cylinders in any practical stroke length required up to 120" gross with standard "A" closed dimension (including fractional inches) with choice of cataloged rod ends. For stroke lengths over 120" consult factory.

Note: If stop tubing is required, apply the stroke adder for the required cylinder GROSS stroke, then apply appropriate stop tube base & length adder per price list, which will achieve required NET Stroke.

Note: Please contact factory for Nitro and Stainless rod material availability.

Main Barrel and Rod Coding



Bore Code	Body Bore and O.D. Diameter	Rod Diameter	Rod Code	WMD Series					WHD Series				
				A	Std. WF	Ports			A	Std. WF	Ports		
						Size	CP	HP			Size	CP	HP
45	4.50" ID x 5.12" OD	1.75"	17	5.94"	0.88"	#8 SAE	1.75"	2.81"	7.69"	0.88"	#10 SAE	2.25"	3.38"
		2.00"	20	5.94"	0.88"	#8 SAE	1.75"	2.81"	7.69"	0.88"	#10 SAE	2.25"	3.38"
		2.50"	25	5.94"	0.88"	#8 SAE	1.75"	2.81"	7.69"	0.88"	#10 SAE	2.25"	3.38"
		3.00"	30	5.94"	0.88"	#8 SAE	1.75"	2.81"	7.69"	0.88"	#10 SAE	2.25"	3.38"
		3.50"	35	5.94"	0.88"	#8 SAE	1.75"	2.81"	7.69"	0.88"	#10 SAE	2.25"	3.38"
50	5.00" ID x 5.62" OD	2.00"	20	6.31"	0.88"	#8 SAE	2.00"	2.81"	8.25"	0.88"	#12 SAE	2.38"	3.63"
		2.50"	25	6.31"	0.88"	#8 SAE	2.00"	2.81"	8.25"	0.88"	#12 SAE	2.38"	3.63"
		3.00"	30	6.31"	0.88"	#8 SAE	2.00"	2.81"	8.25"	0.88"	#12 SAE	2.38"	3.63"
		3.50"	35	6.31"	0.88"	#8 SAE	2.00"	2.81"	8.25"	0.88"	#12 SAE	2.38"	3.63"
		4.00"	40	6.31"	0.88"	#8 SAE	2.00"	2.81"	8.25"	0.88"	#12 SAE	2.38"	3.63"
55	5.50" ID x 6.25" OD	2.50"	25	N/A	N/A	N/A	N/A	N/A	8.25"	0.88"	#12 SAE	2.44"	3.63"
		3.00"	30	N/A	N/A	N/A	N/A	N/A	8.25"	0.88"	#12 SAE	2.44"	3.63"
		3.50"	35	N/A	N/A	N/A	N/A	N/A	8.25"	0.88"	#12 SAE	2.44"	3.63"
		4.00"	40	N/A	N/A	N/A	N/A	N/A	8.25"	0.88"	#12 SAE	2.44"	3.63"
		4.50"	45	N/A	N/A	N/A	N/A	N/A	8.25"	0.88"	#12 SAE	2.44"	3.63"
60	6.00" ID x 6.75" OD	2.50"	25	N/A	N/A	N/A	N/A	N/A	8.25"	0.88"	#12 SAE	2.44"	3.63"
		3.00"	30	N/A	N/A	N/A	N/A	N/A	8.25"	0.88"	#12 SAE	2.44"	3.63"
		3.50"	35	N/A	N/A	N/A	N/A	N/A	8.25"	0.88"	#12 SAE	2.44"	3.63"
		4.00"	40	N/A	N/A	N/A	N/A	N/A	8.25"	0.88"	#12 SAE	2.44"	3.63"
		4.50"	45	N/A	N/A	N/A	N/A	N/A	8.25"	0.88"	#12 SAE	2.44"	3.63"
70	7.00" ID x 7.75" OD	2.50"	25	N/A	N/A	N/A	N/A	N/A	8.75"	0.88"	#16 SAE	2.44"	4.00"
		3.00"	30	N/A	N/A	N/A	N/A	N/A	8.75"	0.88"	#16 SAE	2.44"	4.00"
		3.50"	35	N/A	N/A	N/A	N/A	N/A	8.75"	0.88"	#16 SAE	2.44"	4.00"
		4.00"	40	N/A	N/A	N/A	N/A	N/A	8.75"	0.88"	#16 SAE	2.44"	4.00"
		4.50"	45	N/A	N/A	N/A	N/A	N/A	8.75"	0.88"	#16 SAE	2.44"	4.00"
80	8.00" ID x 9.00" OD	3.50"	35	N/A	N/A	N/A	N/A	N/A	9.69"	0.88"	#16 SAE	2.69"	4.00"
		4.00"	40	N/A	N/A	N/A	N/A	N/A	9.69"	0.88"	#16 SAE	2.69"	4.00"
		4.50"	45	N/A	N/A	N/A	N/A	N/A	9.69"	0.88"	#16 SAE	2.69"	4.00"

The Completed Cylinder Overall Closed Dimension will Equal Following;

- the "A" Dimension (from main barrel and rod coding page)
- + the Base Mount "L" or "LT" Dimension (from base mount code page)
- + the Rod Mount "WF" Dimension (from rod mount code page)
- + the Rod Mount "CA" or "CE" or "CH" Dimension (from rod mount code page)
- + the Gross Cylinder Stroke
- + any Additional Rod Extension (if specified)
- = Overall Closed Dimension

Standard Build Cylinders in any practical stroke length required up to 120" gross with standard "A" closed dimension (including fractional inches) with choice of cataloged rod ends. For stroke lengths over 120" consult factory.

Note: If stop tubing is required, apply the stroke adder for the required cylinder GROSS stroke, then apply appropriate stop tube base & length adder per price list, which will achieve required NET Stroke.

Note: Please contact factory for Nitro and Stainless rod material availability.

How to Order Standard Build Series Cylinders

Part Number Ordering Example

Series	Bore Code Page 6,7	Piston Cushions	Body Mount Code	Rod Mount Code	Stroke (Enter in inches 3 decimal points)	Rod Extension Page 29 (default is 0.000")	Stop Tube Length Page 29 (default is 0.000")	Extend, Cap Port	Extend, Cap Port Location	Retract, Head Port (Ref: Cap Port)	Retract, Head Port Location	Options		
H	P	60	35	N	D207015	SN201530	65.625	3.250	8.625	TS12	90	TE16	270	N

Code Type
P Urethane
Contact factory for other seal options.

Code Type Page
??? Position 29
In Degrees

Code Type Page
TS?? SAE Straight Thread 29
TE?? SAE Straight Thread, 90 Deg 29
US?? NPTF Port, Conventional 29
UE?? NPTF Port, Conventional, 90 Deg 29
Contact factory for other porting options.

Code Series Page
M WMD 2,500 PSI 4
H WHD 3,000 PSI 5

Code Type
N None
Contact factory for other cushion piston options.

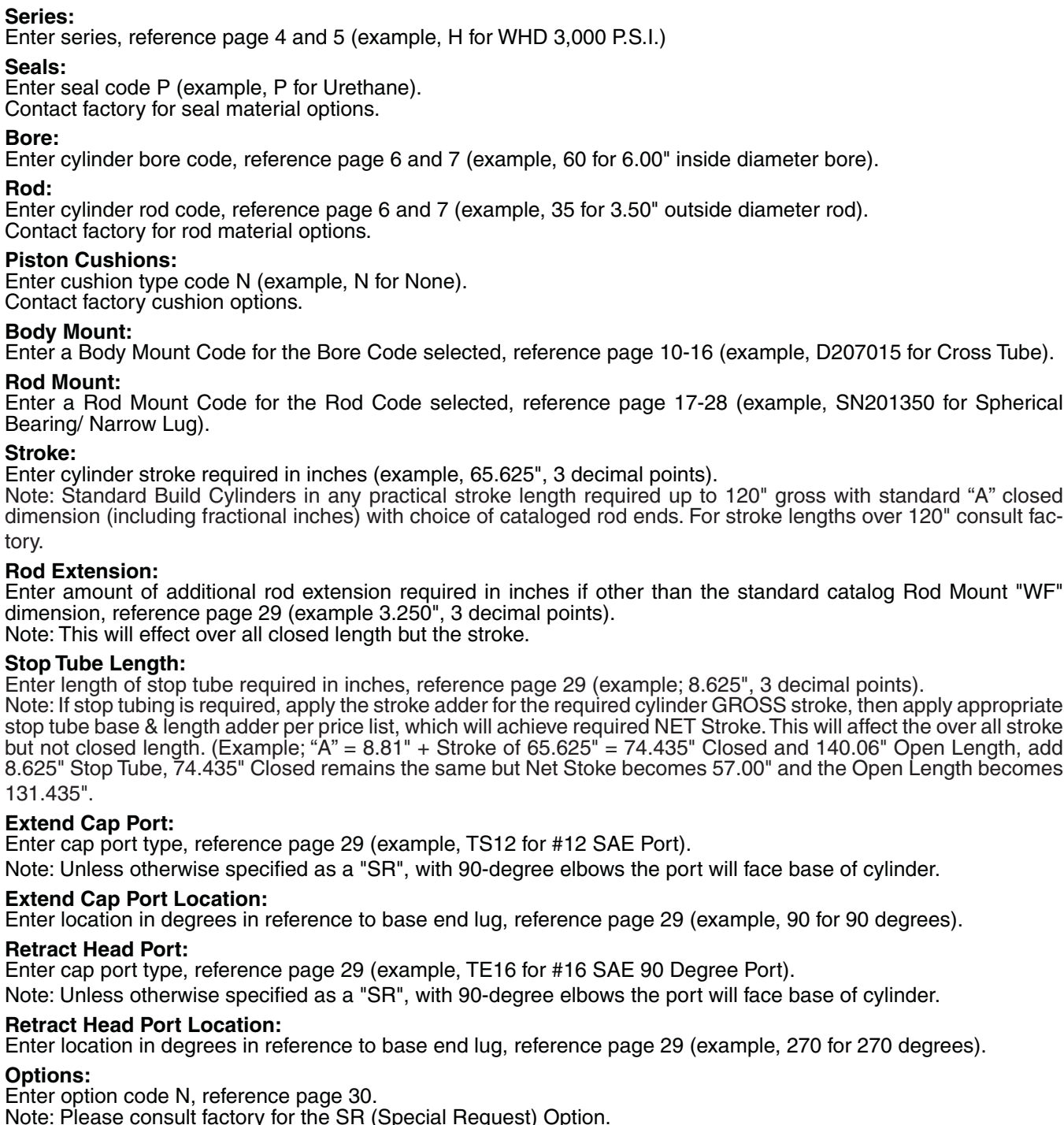
Code Type Page
N None 30
SR Special Request 30

Code Type Page
A????? None 10
C????? Lug / Tang 13
SN????? Spherical Bearing, Narrow Lug 14
D????? Cross Tube 12
L????? Clevis (Double Lug) 11

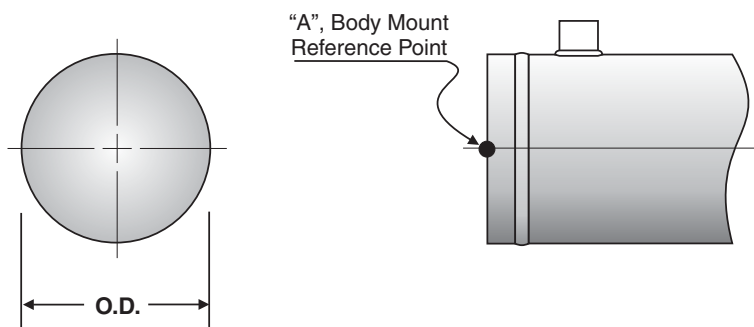
See page 15,16 for other mounting options. Using "other mounting options" make this a custom built cylinder. Contact factory an a special part number, pricing and delivery will be given to you.

Code Type Page
A????? None 17
B????? Drilled Thru Rod 25
C????? Lug / Tang 22,23
SN????? Spherical Bearing, Narrow Lug 24
D????? Cross Tube 20,21
E????? Male Thread 27
L????? Clevis 18,19
N????? Drilled & Tapped, 1 Hole 26

See page 28 for other mounting options. Using "other mounting options" make this a custom built cylinder. Contact factory an a special part number, pricing and delivery will be given to you.



"A" Body Mount Code, No Body Mounts

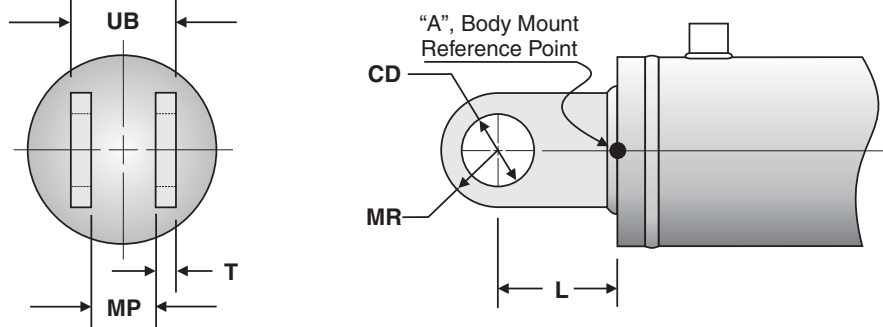


Body Code	Bore	Body Mount Code	Body O.D.
20	2.00" ID	A000000	2.50"
25	2.50" ID	A000000	3.00"
30	3.00" ID	A000000	3.50"
32	3.25" ID	A000000	3.75"
35	3.50" ID	A000000	4.00"
40	4.00" ID	A000000	4.62"
45	4.50" ID	A000000	5.12"
50	5.00" ID	A000000	5.62"
55	5.50" ID	A000000	6.25"
60	6.00" ID	A000000	6.75"
70	7.00" ID	A000000	7.75"
80	8.00" ID	A000000	9.00"

Body / Main Barrel Mount Code

"L" Body Mount Code, Clevis (Double Lug) Body Mounts

Some sizes dimensionally interchangeable with NFPA Style MP1



Body Code	Bore	Body Mount Code	Nominal Pin Size	Actual CD	Gap MP	Thickness T	Width UB	Radius MR	Length L	Max Pull at Yield *
20	2.00" ID	L071206	0.75"	0.752"	1.28"	0.62"	2.53"	0.75"	1.25"	20,000#
20	2.00" ID	L101205	1.00"	1.015"	1.28"	0.50"	2.28"	1.00"	2.00"	20,000#
25	2.50" ID	L071206	0.75"	0.752"	1.28"	0.62"	2.53"	0.75"	1.25"	20,000#
25	2.50" ID	L101205	1.00"	1.015"	1.28"	0.50"	2.28"	1.00"	2.00"	20,000#
30	3.00" ID	L101205	1.00"	1.015"	1.28"	0.50"	2.28"	1.00"	2.00"	20,000#
32	3.25" ID	L101507	1.00"	1.015"	1.52"	0.75"	3.02"	1.12"	1.50"	30,000#
35	3.50" ID	L101205	1.00"	1.015"	1.28"	0.50"	2.28"	1.00"	2.00"	20,000#
35	3.50" ID	L121607	1.25"	1.265"	1.62"	0.75"	3.13"	1.25"	2.00"	30,000#
40	4.00" ID	L101205	1.00"	1.015"	1.28"	0.50"	2.28"	1.00"	2.00"	20,000#
40	4.00" ID	L132010	1.38"	1.390"	1.62"	1.00"	4.03"	1.62"	2.12"	45,000#
40	4.00" ID	L151610	1.50"	1.515"	1.62"	1.00"	3.62"	1.50"	2.00"	50,000#
45	4.50" ID	L121607	1.25"	1.265"	1.62"	0.75"	3.12"	1.25"	2.00"	45,000#
45	4.50" ID	L151610	1.50"	1.515"	1.62"	1.00"	3.62"	1.50"	2.00"	50,000#
50	5.00" ID	L152110	1.50"	1.515"	2.12"	1.00"	4.12"	1.50"	2.50"	50,000#
50	5.00" ID	L172110	1.75"	1.765"	2.12"	1.00"	4.12"	1.75"	2.25"	60,000#
50	5.00" ID	L172512	1.75"	1.765"	2.52"	1.25"	5.02"	2.12"	2.25"	100,000#
55	5.50" ID	L172112	1.75"	1.765"	2.12"	1.25"	4.62"	1.75"	2.25"	75,000#
60	6.00" ID	L202512	2.00"	2.015"	2.52"	1.25"	5.02"	2.38"	2.50"	120,000#
60	6.00" ID	L202612	2.00"	2.015"	2.62"	1.25"	5.12"	2.00"	2.50"	90,000#
70	7.00" ID	L252612	2.50"	2.515"	2.62"	1.25"	5.12"	2.50"	3.00"	110,000#
70	7.00" ID	L253015	2.50"	2.515"	3.02"	1.50"	6.02"	2.88"	3.00"	90,000#
80	8.00" ID	L303015	3.00"	3.015"	3.02"	1.50"	6.02"	3.12"	3.25"	170,000#
80	8.00" ID	L303115	3.00"	3.015"	3.12"	1.50"	6.12"	3.00"	4.00"	160,000#

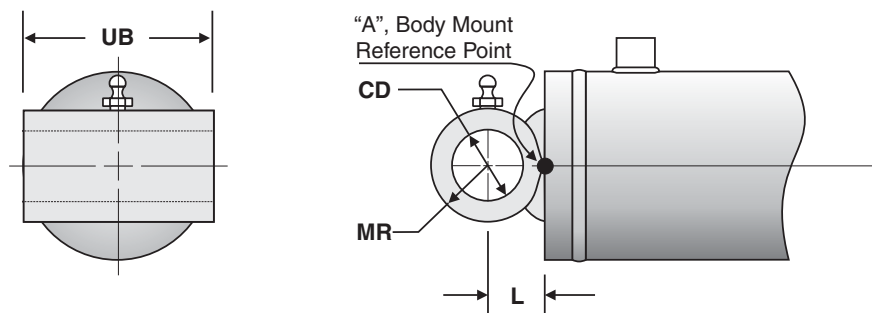
* Max Pull Yield is based on a 2:1 safety factor

Body Mount Code Description = L 07 12 06
Code Pin Size Gap Thickness

Note: Other mounts sizes available.

Note: Mounts also available with optional bushings.

"D" Body Mount Code, Cross Tube Body Mounts



Body Code	Bore	Body Mount Code	Nominal Pin Size	Actual CD	Width UB	Length L	Radius MR	Max Pull at Yield *
20	2.00" ID	D103009	1.00"	1.015"	3.00"	0.81"	0.88"	15,000#
25	2.50" ID	D103209	1.00"	1.015"	3.25"	0.81"	0.88"	15,000#
30	3.00" ID	D103709	1.00"	1.015"	3.75"	0.81"	0.88"	20,000#
30	3.00" ID	D124210	1.25"	1.265"	4.25"	0.94"	1.00"	20,000#
32	3.25" ID	D124210	1.25"	1.265"	4.25"	0.94"	1.00"	25,000#
35	3.50" ID	D124210	1.25"	1.265"	4.25"	0.94"	1.00"	27,500#
40	4.00" ID	D124710	1.25"	1.265"	4.75"	0.94"	1.00"	35,000#
40	4.00" ID	D154712	1.50"	1.515"	4.75"	1.12"	1.25"	32,500#
45	4.50" ID	D125210	1.25"	1.265"	5.25"	0.94"	1.00"	42,500#
45	4.50" ID	D155512	1.50"	1.515"	5.50"	1.12"	1.25"	42,500#
50	5.00" ID	D156012	1.50"	1.515"	6.00"	1.12"	1.25"	50,000#
50	5.00" ID	D176014	1.75"	1.765"	6.00"	1.25"	1.38"	50,000#
55	5.50" ID	D177014	1.75"	1.765"	7.00"	1.25"	1.38"	57,500#
55	5.50" ID	D207015	2.00"	2.062"	7.00"	1.38"	1.50"	57,500#
60	6.00" ID	D207015	2.00"	2.062"	7.00"	1.38"	1.50"	75,000#
70	7.00" ID	D258217	2.50"	2.515"	8.25"	1.62"	1.75"	110,000#
80	8.00" ID	D309220	3.00"	3.015"	9.25"	1.88"	2.00"	140,000#

* Max Pull Yield is based on a 2:1 safety factor

Body Mount Code Description = **D** **10** **30** **09**
 Code Pin Size Width Radius

Note: 1/8" grease fitting located at 0 / 360 degrees unless otherwise specified

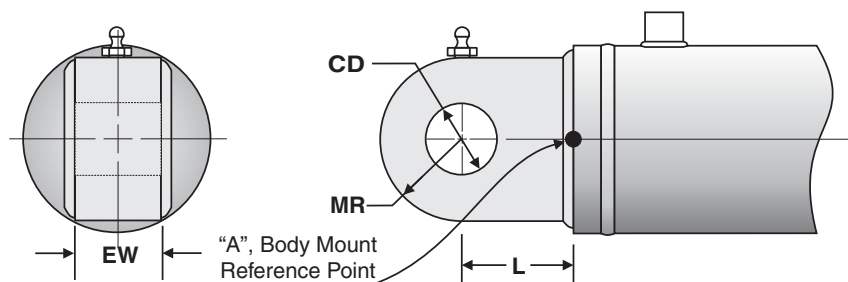
Note: Other mounts sizes available.

Note: Mounts also available with optional bushings.

Body / Main Barrel Mount Code

"C" Body Mount Code, Lug Body Mounts

Some sizes dimensionally interchangeable with NFPA Style MP3



Body Code	Bore	Body Mount Code	Nominal Pin Size	Actual CD	Width EW	Length L	Radius MR	Max Pull at Yield *
20	2.00" ID	C101020	1.00"	1.015"	1.00"	2.00"	1.00"	25,000#
20	2.00" ID	C101220	1.00"	1.015"	1.25"	2.00"	1.00"	25,000#
25	2.50" ID	C101020	1.00"	1.015"	1.00"	2.00"	1.00"	25,000#
25	2.50" ID	C101220	1.00"	1.015"	1.25"	2.00"	1.00"	25,000#
30	3.00" ID	C101020	1.00"	1.015"	1.00"	2.00"	1.00"	25,000#
30	3.00" ID	C101220	1.00"	1.015"	1.25"	2.00"	1.00"	25,000#
32	3.25" ID	C121525	1.25"	1.265"	1.50"	2.50"	1.25"	30,000#
32	3.25" ID	C122025	1.25"	1.265"	2.00"	2.50"	1.25"	30,000#
35	3.50" ID	C121525	1.25"	1.265"	1.50"	2.50"	1.25"	30,000#
35	3.50" ID	C122025	1.25"	1.265"	2.00"	2.50"	1.25"	30,000#
40	4.00" ID	C121525	1.25"	1.265"	1.50"	2.50"	1.25"	37,500#
40	4.00" ID	C122025	1.25"	1.265"	2.00"	2.50"	1.25"	40,000#
45	4.50" ID	C121525	1.25"	1.265"	1.50"	2.50"	1.25"	45,000#
45	4.50" ID	C122025	1.25"	1.265"	2.00"	2.50"	1.25"	50,000#
50	5.00" ID	C152025	1.50"	1.515"	2.00"	2.50"	1.25"	50,000#
50	5.00" ID	C152525	1.50"	1.515"	2.50"	2.50"	1.25"	55,000#
50	5.00" ID	C202530	2.00"	2.015"	2.00"	2.50"	1.25"	25,000#
55	5.50" ID	C202030	2.00"	2.015"	2.00"	2.50"	1.25"	95,000#
55	5.50" ID	C202530	2.00"	2.015"	2.50"	3.00"	2.00"	72,000#
60	6.00" ID	C202030	2.00"	2.015"	2.00"	3.00"	2.00"	95,000#
60	6.00" ID	C202530	2.00"	2.015"	2.50"	3.00"	2.00"	95,000#
70	7.00" ID	C202030	2.00"	2.015"	2.00"	3.00"	2.00"	95,000#
70	7.00" ID	C202530	2.00"	2.015"	2.50"	3.00"	2.00"	120,000#
80	8.00" ID	C202030	2.00"	2.015"	2.00"	3.00"	2.00"	95,000#
80	8.00" ID	C202530	2.00"	2.015"	2.50"	3.00"	2.00"	120,000#
80	8.00" ID	C253534	2.50"	2.515"	3.50"	3.38"	3.00"	175,000#

* Max Pull Yield is based on a 2:1 safety factor

Body Mount Code Description = C 10 10 20
Code Pin Size Width Length

Note: 1/8" grease fitting located at 0 / 360 degrees unless otherwise specified

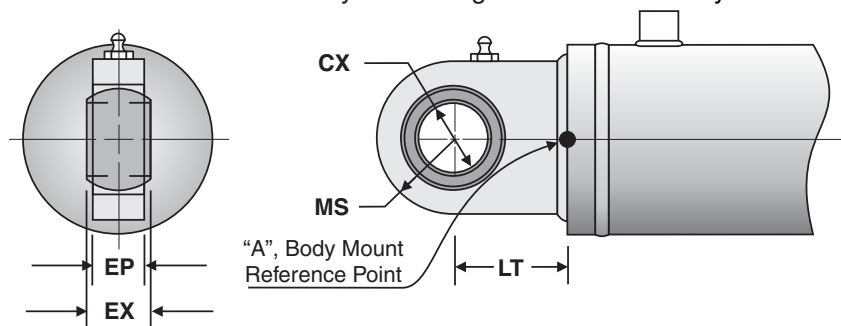
Note: Other mounts sizes available.

Note: Mounts also available with optional bushings.

Body / Main Barrel Mount Code

"SN" Body Mount Code, Spherical Bearing Body Mounts

Some sizes dimensionally interchangeable with NFPA Style MP5



Body Code	Bore	Body Mount Code	Nominal Pin Size	Actual CX	Bearing Width EX	Lug Width EP	Length LT	Radius MS	Max Pull at Yield
20	2.00" ID	SN100720	1.00"	1.00"	0.88"	0.75"	2.00"	1.25"	15,000#
25	2.50" ID	SN100720	1.00"	1.00"	0.88"	0.75"	2.00"	1.25"	15,000#
30	3.00" ID	SN100720	1.00"	1.00"	0.88"	0.75"	2.00"	1.25"	15,000#
30	3.00" ID	SN120920	1.25"	1.25"	1.09"	0.94"	2.00"	1.50"	20,000#
30	3.00" ID	SN151125	1.50"	1.50"	1.31"	1.12"	2.50"	1.88"	35,000#
32	3.25" ID	SN120920	1.25"	1.25"	1.09"	0.94"	2.00"	1.50"	20,000#
32	3.25" ID	SN151125	1.50"	1.50"	1.31"	1.12"	2.50"	1.88"	35,000#
35	3.50" ID	SN120920	1.25"	1.25"	1.09"	0.94"	2.00"	1.50"	20,000#
35	3.50" ID	SN151125	1.50"	1.50"	1.31"	1.12"	2.50"	1.88"	35,000#
40	4.00" ID	SN151125	1.50"	1.50"	1.31"	1.12"	2.50"	1.88"	35,000#
40	4.00" ID	SN171325	1.75"	1.75"	1.53"	1.31"	2.50"	2.00"	35,000#
40	4.00" ID	SN201525	2.00"	2.00"	1.75"	1.50"	2.50"	2.38"	55,000#
45	4.50" ID	SN151125	1.50"	1.50"	1.31"	1.12"	2.50"	1.88"	35,000#
45	4.50" ID	SN171325	1.75"	1.75"	1.53"	1.31"	2.50"	2.00"	35,000#
45	4.50" ID	SN201525	2.00"	2.00"	1.75"	1.50"	2.50"	2.38"	55,000#
50	5.00" ID	SN171325	1.75"	1.75"	1.53"	1.31"	2.50"	2.00"	35,000#
50	5.00" ID	SN201525	2.00"	2.00"	1.75"	1.50"	2.50"	2.38"	55,000#
50	5.00" ID	SN251932	2.50"	2.50"	2.19"	1.88"	3.25"	3.00"	95,000#
55	5.50" ID	SN171325	1.75"	1.75"	1.53"	1.31"	2.50"	2.00"	35,000#
55	5.50" ID	SN201525	2.00"	2.00"	1.75"	1.50"	2.50"	2.38"	55,000#
55	5.50" ID	SN251932	2.50"	2.50"	2.19"	1.88"	3.25"	3.00"	95,000#
60	6.00" ID	SN171325	1.75"	1.75"	1.53"	1.31"	2.50"	2.00"	35,000#
60	6.00" ID	SN201525	2.00"	2.00"	1.75"	1.50"	2.50"	2.38"	55,000#
60	6.00" ID	SN251932	2.50"	2.50"	2.19"	1.88"	3.25"	3.00"	95,000#
70	7.00" ID	SN251932	2.50"	2.50"	2.19"	1.88"	3.25"	3.00"	95,000#
70	7.00" ID	SN302242	3.00"	3.00"	2.62"	2.25"	4.25"	3.75"	120,000#
80	8.00" ID	SN302242	3.00"	3.00"	2.62"	2.25"	4.25"	3.75"	120,000#

* Max Pull Yield is based on a 2:1 safety factor

Body Mount Code Description = SN 10 10 20
Code Pin Size Width Length

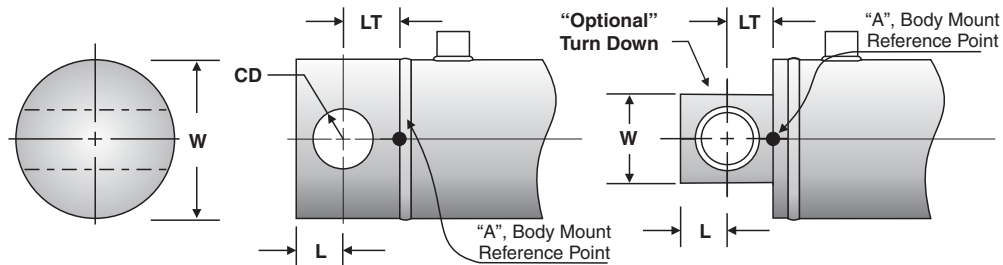
Note: 1/8" grease fitting located at 0 / 360 degrees unless otherwise specified

Note: Other mounts sizes available.

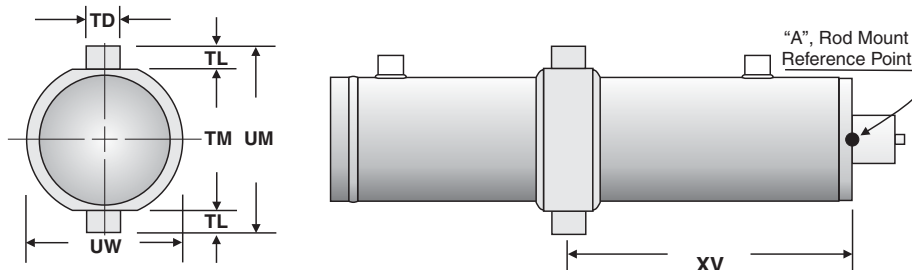
Body / Main Barrel Mount Code

Other mounting options available upon request:
Please contact sales office for availability.

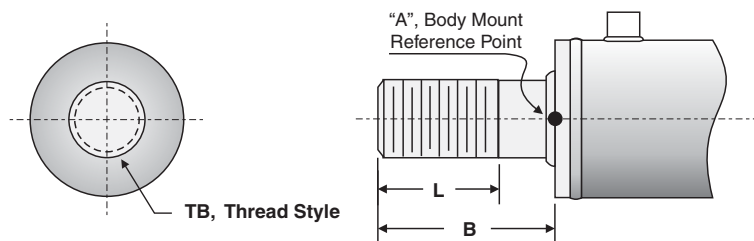
"B" Body Mount Code, Drill Thru B Body Mounts



"M" Body Mount Code, Trunnion Body Mounts



"E" Body Mount Code, Male Thread Body Mounts

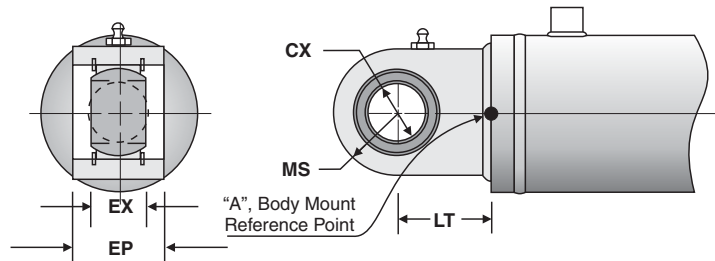


Body / Main Barrel Mount Code

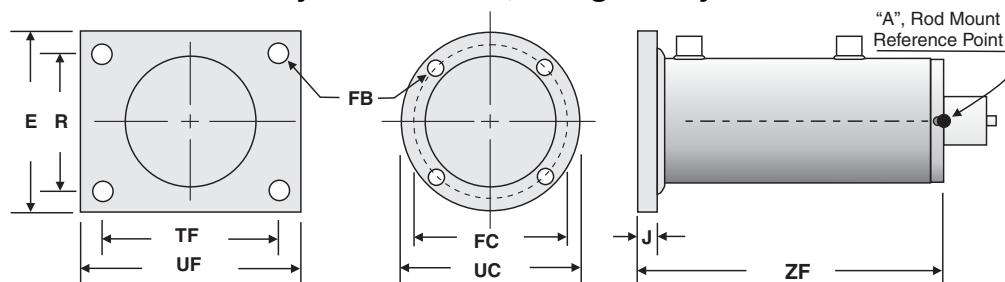
Other mounting options available upon request:

Please contact sales office for availability.

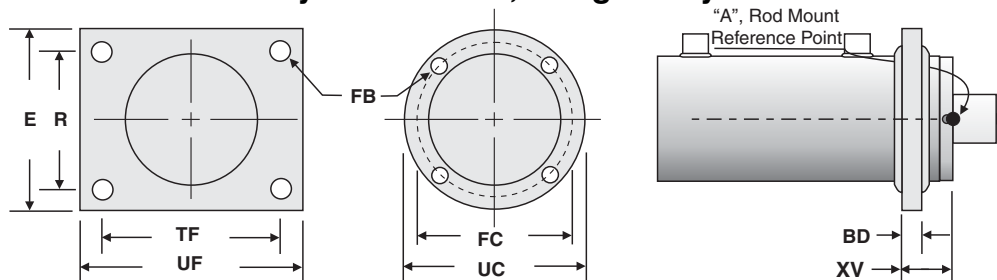
"SW" Body Mount Code, Wide Spherical Bearing Body Mounts



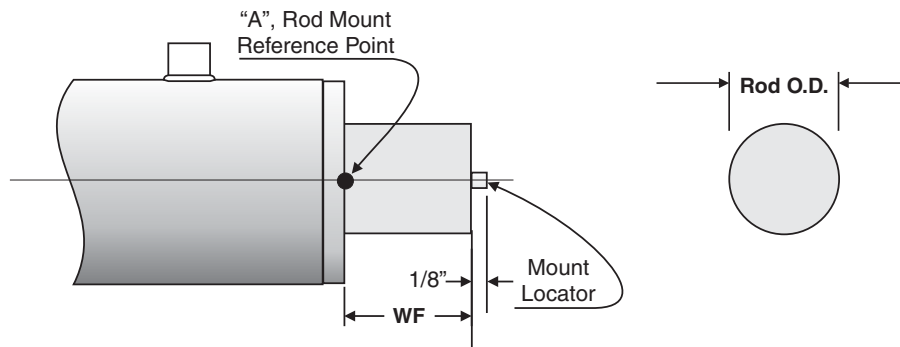
"G" Body Mount Code, Flange Body Mounts



"H" Body Mount Code, Flange Body Mounts

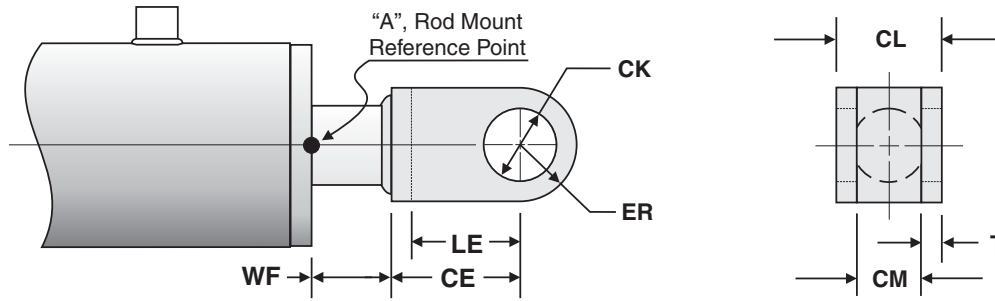


"A" Rod Mount Code, No Rod Mounts



Rod Code	Rod Diameter	Rod Mount Code	Standard Rod Ext. WF
10	1.00" OD	A000000	0.88"
11	1.12" OD	A000000	0.88"
12	1.25" OD	A000000	0.88"
13	1.38" OD	A000000	0.88"
15	1.50" OD	A000000	0.88"
17	1.75" OD	A000000	0.88"
20	2.00" OD	A000000	0.88"
25	2.50" OD	A000000	0.88"
30	3.00" OD	A000000	0.88"
35	3.50" OD	A000000	0.88"
40	4.00" OD	A000000	0.88"
45	4.50" OD	A000000	0.88"

"L" Rod Mount Code, Clevis (Double Lug) Rod Mounts

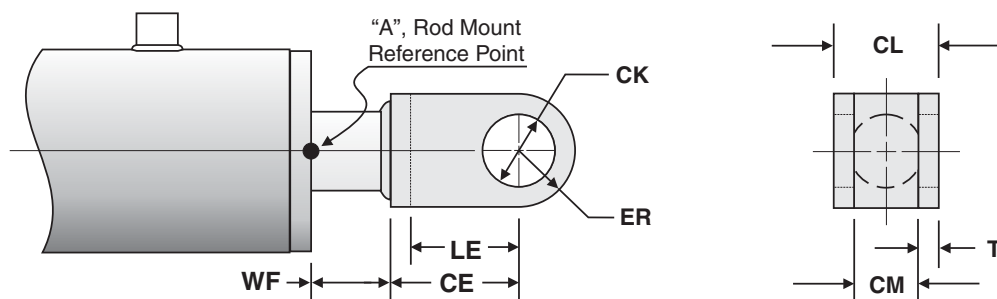


Rod Code	Rod Diameter	Rod Mount Code	Nominal Pin Size	Actual CK	Gap CM	Thickness T	Width CL	Radius ER	Length LE	Length CE	Rod Ext. WF	Max Pull at Yield *
10	1.00" OD	L101205	1.00"	1.015"	1.28"	0.50"	2.28"	1.00"	2.00"	2.50"	0.88"	16,500#
11	1.12" OD	L101205	1.00"	1.015"	1.28"	0.50"	2.28"	1.00"	2.00"	2.50"	0.88"	16,500#
12	1.25" OD	L101205	1.00"	1.015"	1.28"	0.50"	2.28"	1.00"	2.00"	2.50"	0.88"	25,000#
12	1.25" OD	L111205	1.12"	1.140"	1.28"	0.50"	2.28"	1.00"	2.00"	2.50"	0.88"	23,000#
13	1.38" OD	L101205	1.00"	1.015"	1.28"	0.50"	2.28"	1.00"	2.00"	2.50"	0.88"	25,000#
13	1.38" OD	L111205	1.12"	1.140"	1.28"	0.50"	2.28"	1.00"	2.00"	2.50"	0.88"	23,000#
15	1.50" OD	L101205	1.00"	1.015"	1.28"	0.50"	2.28"	1.00"	2.00"	2.50"	0.88"	25,000#
15	1.50" OD	L111205	1.12"	1.140"	1.28"	0.50"	2.28"	1.00"	2.00"	2.50"	0.88"	23,000#
17	1.75" OD	L101205	1.00"	1.015"	1.28"	0.50"	2.28"	1.00"	2.00"	2.50"	0.88"	25,000#
17	1.75" OD	L111205	1.12"	1.140"	1.28"	0.50"	2.28"	1.00"	2.00"	2.50"	0.88"	23,000#
17	1.75" OD	L121607	1.25"	1.265"	1.62"	0.75"	3.12"	1.25"	2.00"	2.75"	0.88"	50,000#
17	1.75" OD	L151610	1.50"	1.515"	1.62"	1.00"	3.62"	1.50"	2.00"	3.00"	0.88"	52,000#
20	2.00" OD	L101205	1.00"	1.015"	1.28"	0.50"	2.28"	1.00"	2.00"	2.50"	0.88"	25,000#
20	2.00" OD	L111205	1.12"	1.140"	1.28"	0.50"	2.28"	1.00"	2.00"	2.50"	0.88"	23,000#
20	2.00" OD	L121607	1.25"	1.265"	1.62"	0.75"	3.12"	1.25"	2.00"	2.75"	0.88"	50,000#
20	2.00" OD	L151610	1.50"	1.515"	1.62"	1.00"	3.62"	1.50"	2.00"	3.00"	0.88"	62,000#
20	2.00" OD	L152110	1.50"	1.515"	2.12"	1.00"	4.12"	1.50"	2.50"	3.50"	0.88"	62,000#
20	2.00" OD	L172110	1.75"	1.765"	2.12"	1.00"	4.12"	1.75"	2.25"	3.25"	0.88"	62,000#
25	2.50" OD	L101205	1.00"	1.015"	1.28"	0.50"	2.28"	1.00"	2.00"	2.50"	0.88"	25,000#
25	2.50" OD	L121607	1.25"	1.265"	1.62"	0.75"	3.12"	1.25"	2.00"	2.75"	0.88"	50,000#
25	2.50" OD	L151610	1.50"	1.515"	1.62"	1.00"	3.62"	1.50"	2.00"	3.00"	0.88"	80,000#
25	2.50" OD	L152110	1.50"	1.515"	2.12"	1.00"	4.12"	1.50"	2.50"	3.50"	0.88"	80,000#
25	2.50" OD	L172110	1.75"	1.765"	2.12"	1.00"	4.12"	1.75"	2.25"	3.25"	0.88"	93,000#
25	2.50" OD	L172112	1.75"	1.765"	2.12"	1.25"	4.62"	1.75"	2.25"	3.50"	0.88"	112,000#
25	2.50" OD	L202612	2.00"	2.015"	2.62"	1.25"	5.15"	2.00"	2.50"	3.75"	0.88"	134,000#
25	2.50" OD	L252612	2.50"	2.515"	2.62"	1.25"	5.12"	2.50"	3.00"	4.25"	0.88"	134,000#

* Max Pull Yield is based on a 2:1 safety factor

Rod Mount Code Description = $\frac{L}{Code} \frac{07}{Pin\ Size} \frac{12}{Gap} \frac{06}{Thickness}$
 Note: Other mounts sizes available.
 Note: Mounts also available with optional bushings.

"L" Rod Mount Code, Clevis (Double Lug) Rod Mounts

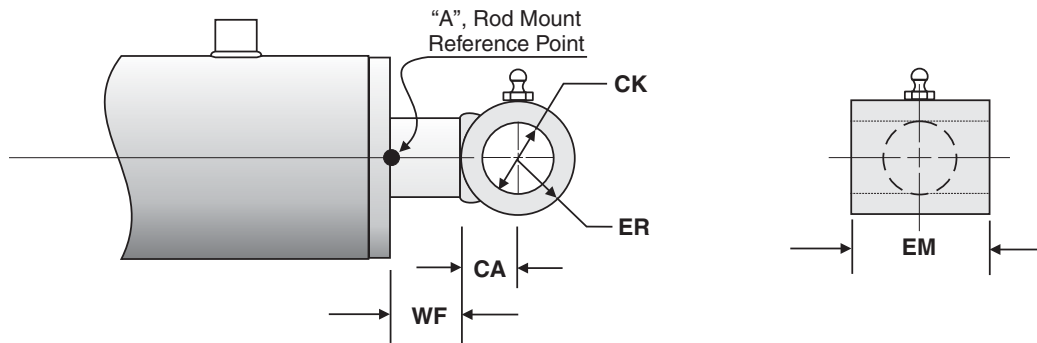


Rod Code	Rod Diameter	Rod Mount Code	Nominal Pin Size	Actual CK	Gap CM	Thickness T	Width CL	Radius ER	Length LE	Length CE	Rod Ext. WF	Max Pull at Yield *
30	3.00" OD	L151610	1.50"	1.515"	1.62"	1.00"	3.62"	1.50"	2.00"	3.00"	0.88"	80,000#
30	3.00" OD	L152110	1.50"	1.515"	2.12"	1.00"	4.12"	1.50"	2.50"	3.50"	0.88"	80,000#
30	3.00" OD	L172110	1.75"	1.765"	2.12"	1.00"	4.12"	1.75"	2.25"	3.25"	0.88"	93,000#
30	3.00" OD	L172112	1.75"	1.765"	2.12"	1.25"	4.62"	1.75"	2.25"	3.50"	0.88"	117,000#
30	3.00" OD	L202612	2.00"	2.015"	2.62"	1.25"	5.15"	2.00"	2.50"	3.75"	0.88"	128,000#
30	3.00" OD	L252612	2.50"	2.515"	2.62"	1.25"	5.12"	2.50"	3.00"	4.25"	0.88"	128,000#
35	3.50" OD	L172110	1.75"	1.765"	2.12"	1.00"	4.12"	1.75"	2.25"	3.25"	0.88"	93,000#
35	3.50" OD	L172112	1.75"	1.765"	2.12"	1.25"	4.62"	1.75"	2.25"	3.50"	0.88"	112,000#
35	3.50" OD	L202612	2.00"	2.015"	2.62"	1.25"	5.15"	2.00"	2.50"	3.75"	0.88"	134,000#
35	3.50" OD	L252612	2.50"	2.515"	2.62"	1.25"	5.12"	2.50"	3.00"	4.25"	0.88"	140,000#
35	3.50" OD	L303115	3.00"	3.015"	3.12"	1.50"	6.12"	3.00"	4.00"	5.50"	0.88"	140,000#
40	4.00" OD	L252612	2.50"	2.515"	2.62"	1.25"	5.12"	2.50"	3.00"	4.25"	0.88"	139,000#
40	4.00" OD	L303115	3.00"	3.015"	3.12"	1.50"	6.12"	3.00"	4.00"	5.50"	0.88"	139,000#
45	4.50" OD	L252612	2.50"	2.515"	2.62"	1.25"	5.12"	2.50"	3.00"	4.25"	0.88"	140,000#
45	4.50" OD	L303115	3.00"	3.015"	3.12"	1.50"	6.12"	3.00"	4.00"	5.50"	0.88"	140,000#

* Max Pull Yield is based on a 2:1 safety factor

Rod Mount Code Description = L 07 12 06
 Code Pin Size Gap Thickness
 Note: Other mounts sizes available.
 Note: Mounts also available with optional bushings.

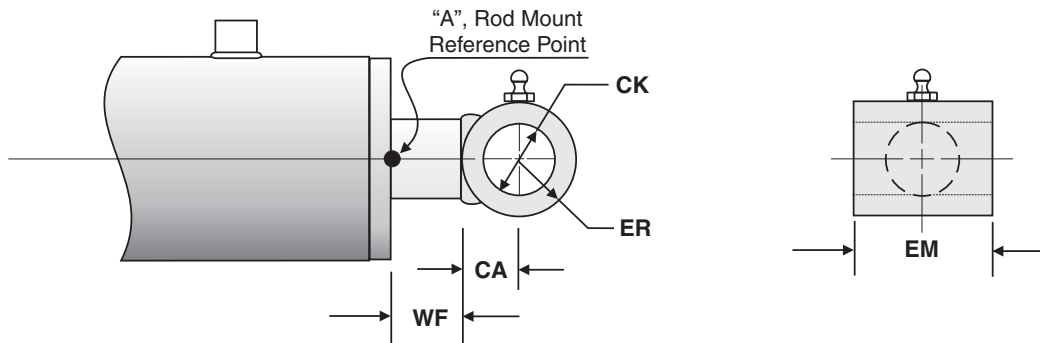
"D" Rod Mount Code, Cross Tube Rod Mounts



Rod Code	Rod Diameter	Rod Mount Code	Nominal Pin Size	Actual CK	Width EM	Length CA	Radius ER	Rod Ext. WF	Max Pull at Yield *
10	1.00" OD	D102509	1.00"	1.015"	2.50"	0.81"	0.88"	0.88"	16,500#
10	1.00" OD	D122510	1.25"	1.265"	2.50"	0.94"	1.00"	0.88"	16,500#
11	1.12" OD	D102509	1.00"	1.015"	2.50"	0.81"	0.88"	0.88"	16,500#
11	1.12" OD	D122510	1.25"	1.265"	2.50"	0.94"	1.00"	0.88"	16,500#
12	1.25" OD	D102509	1.00"	1.015"	2.50"	0.81"	0.88"	0.88"	27,600#
12	1.25" OD	D122510	1.25"	1.265"	2.50"	0.94"	1.00"	0.88"	27,600#
13	1.38" OD	D102509	1.00"	1.015"	2.50"	0.81"	0.88"	0.88"	35,300#
13	1.38" OD	D122510	1.25"	1.265"	2.50"	0.94"	1.00"	0.88"	35,300#
15	1.50" OD	D102509	1.00"	1.015"	2.50"	0.81"	0.88"	0.88"	32,500#
15	1.50" OD	D102709	1.00"	1.015"	2.75"	0.81"	0.88"	0.88"	32,500#
15	1.50" OD	D122510	1.25"	1.265"	2.50"	0.94"	1.00"	0.88"	32,500#
15	1.50" OD	D122710	1.25"	1.265"	2.75"	0.94"	1.00"	0.88"	32,500#
15	1.50" OD	D152711	1.50"	1.515"	2.75"	1.00"	1.12"	0.88"	32,500#
17	1.75" OD	D102509	1.00"	1.015"	2.50"	0.81"	0.88"	0.88"	42,300#
17	1.75" OD	D102709	1.00"	1.015"	2.75"	0.81"	0.88"	0.88"	42,300#
17	1.75" OD	D122710	1.25"	1.265"	2.75"	0.94"	1.00"	0.88"	42,300#
17	1.75" OD	D123210	1.25"	1.265"	3.25"	0.94"	1.00"	0.88"	42,300#
17	1.75" OD	D152711	1.50"	1.505"	2.75"	1.00"	1.12"	0.88"	42,300#
17	1.75" OD	D153011	1.50"	1.505"	3.00"	1.00"	1.12"	0.88"	42,300#
17	1.75" OD	D172514	1.75"	1.765"	2.50"	1.25"	1.38"	0.88"	42,300#
17	1.75" OD	D173014	1.75"	1.765"	3.00"	1.25"	1.38"	0.88"	42,300#
17	1.75" OD	D173214	1.75"	1.765"	3.25"	1.25"	1.38"	0.88"	42,300#
17	1.75" OD	D203515	2.00"	2.015"	3.50"	1.38"	1.50"	0.88"	42,300#
17	1.75" OD	D223515	2.25"	2.265"	3.50"	1.38"	1.50"	0.88"	42,300#
20	2.00" OD	D102509	1.00"	1.015"	2.50"	0.81"	0.88"	0.88"	49,700#
20	2.00" OD	D102709	1.00"	1.015"	2.75"	0.81"	0.88"	0.88"	49,700#
20	2.00" OD	D122710	1.25"	1.265"	2.75"	0.94"	1.00"	0.88"	49,700#
20	2.00" OD	D123210	1.25"	1.265"	3.25"	0.94"	1.00"	0.88"	49,700#
20	2.00" OD	D152711	1.50"	1.515"	2.75"	1.00"	1.12"	0.88"	49,700#
20	2.00" OD	D153011	1.50"	1.515"	3.00"	1.00"	1.12"	0.88"	49,700#
20	2.00" OD	D172514	1.75"	1.765"	2.50"	1.25"	1.38"	0.88"	49,700#
20	2.00" OD	D173014	1.75"	1.765"	3.00"	1.25"	1.38"	0.88"	49,700#
20	2.00" OD	D173214	1.75"	1.765"	3.25"	1.25"	1.38"	0.88"	49,700#
20	2.00" OD	D203515	2.00"	2.015"	3.50"	1.38"	1.50"	0.88"	49,700#
20	2.00" OD	D223515	2.25"	2.265"	3.50"	1.38"	1.50"	0.88"	49,700#

* Max Pull Yield is based on a 2:1 safety factor

"D" Rod Mount Code, Cross Tube Rod Mounts

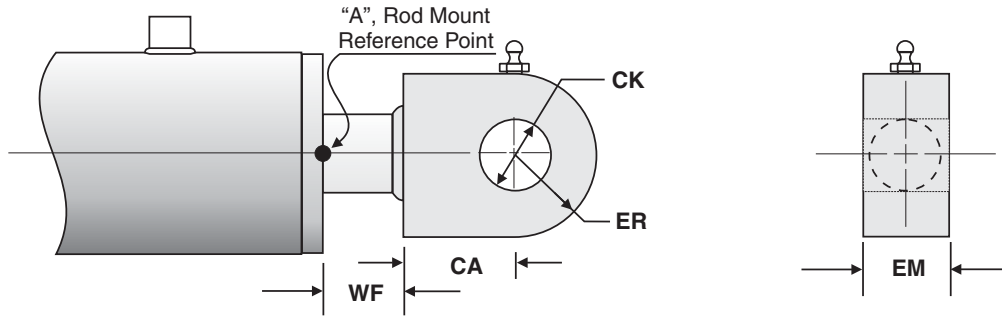


Rod Code	Rod Diameter	Rod Mount Code	Nominal Pin Size	Actual CK	Width EM	Length CA	Radius ER	Rod Ext. WF	Max Pull at Yield *
25	2.50" OD	D122710	1.25"	1.265"	2.75"	0.94"	1.00"	0.88"	71,000#
25	2.50" OD	D152711	1.50"	1.515"	2.75"	1.00"	1.12"	0.88"	102,000#
25	2.50" OD	D153011	1.50"	1.515"	3.00"	1.00"	1.12"	0.88"	102,000#
25	2.50" OD	D173214	1.75"	1.765"	3.25"	1.25"	1.38"	0.88"	102,000#
25	2.50" OD	D203515	2.00"	2.015"	3.50"	1.38"	1.50"	0.88"	102,000#
25	2.50" OD	D225017	2.25"	2.265"	5.00"	1.69"	1.75"	0.88"	102,000#
25	2.50" OD	D255017	2.50"	2.515"	5.00"	1.62"	1.75"	0.88"	102,000#
30	3.00" OD	D154212	1.50"	1.515"	4.25"	1.12"	1.25"	0.88"	91,000#
30	3.00" OD	D174714	1.75"	1.765"	4.75"	1.25"	1.38"	0.88"	100,000
30	3.00" OD	D203515	2.00"	2.015"	3.50"	1.38"	1.50"	0.88"	100,000
30	3.00" OD	D225017	2.25"	2.265"	5.00"	1.69"	1.75"	0.88"	140,000#
30	3.00" OD	D255017	2.50"	2.504"	5.00"	1.62"	1.75"	0.88"	140,000#
30	3.00" OD	D275017	2.75"	2.765"	5.00"	1.62"	1.75"	0.88"	140,000#
35	3.50" OD	D154212	1.50"	1.515"	4.25"	1.12"	1.25"	0.88"	100,000#
35	3.50" OD	D174714	1.75"	1.765"	4.75"	1.25"	1.38"	0.88"	128,000#
35	3.50" OD	D204715	2.00"	2.015"	4.75"	1.38"	1.50"	0.88"	128,000#
35	3.50" OD	D225016	2.25"	2.265"	5.00"	1.56"	1.62"	0.88"	140,000#
35	3.50" OD	D255017	2.50"	2.515"	5.00"	1.62"	1.75"	0.88"	140,000#
35	3.50" OD	D275020	2.75"	2.765"	5.00"	1.81"	2.00"	0.88"	140,000#
35	3.50" OD	D305020	3.00"	3.015"	5.00"	1.88"	2.00"	0.88"	140,000#
40	4.00" OD	D174714	1.75"	1.765"	4.75"	1.25"	1.38"	0.88"	128,000#
40	4.00" OD	D205015	2.00"	2.015"	5.00"	1.38"	1.50"	0.88"	128,000#
40	4.00" OD	D225016	2.25"	2.265"	5.00"	1.56"	1.62"	0.88"	140,000#
40	4.00" OD	D255017	2.50"	2.515"	5.00"	1.62"	1.75"	0.88"	140,000#
40	4.00" OD	D275020	2.75"	2.765"	5.00"	1.81"	2.00"	0.88"	140,000#
40	4.00" OD	D305020	3.00"	3.015"	5.00"	1.88"	2.00"	0.88"	140,000#
45	4.50" OD	D175014	1.75"	1.765"	5.00"	1.25"	1.38"	0.88"	128,000#
45	4.50" OD	D205015	2.00"	2.015"	5.00"	1.38"	1.50"	0.88"	128,000#
45	4.50" OD	D225016	2.25"	2.265"	5.00"	1.56"	1.62"	0.88"	140,000#
45	4.50" OD	D255017	2.50"	2.515"	5.00"	1.62"	1.75"	0.88"	140,000#
45	4.50" OD	D275020	2.75"	2.765"	5.00"	1.81"	2.00"	0.88"	140,000#
45	4.50" OD	D305020	3.00"	3.015"	5.00"	1.88"	2.00"	0.88"	140,000#

* Max Pull Yield is based on a 2:1 safety factor

Rod Mount Code Description = $\frac{D}{Code} \frac{10}{Pin\ Size} \frac{30}{Width} \frac{09}{Radius}$
 Note: Other mounts sizes available.
 Note: Mounts also available with optional bushings.

"C" Rod Mount Code, Lug Rod Mounts



Rod Code	Rod Diameter	Rod Mount Code	Nominal Pin Size	Actual CK	Width EM	Length CA	Radius ER	Rod Ext. WF	Max Pull at Yield *
10	1.00" OD	C071015	0.75"	0.765"	1.00"	1.50"	0.75"	0.88"	13,000#
10	1.00" OD	C101020	1.00"	1.015"	1.00"	2.00"	1.00"	0.88"	15,000#
11	1.12" OD	C101220	1.00"	1.015"	1.25"	2.00"	1.00"	0.88"	16,500#
11	1.12" OD	C121520	1.25"	1.265"	1.50"	2.00"	1.25"	0.88"	16,500#
12	1.25" OD	C101220	1.00"	1.015"	1.25"	2.00"	1.00"	0.88"	30,000#
12	1.25" OD	C121520	1.25"	1.265"	1.50"	2.00"	1.25"	0.88"	30,000#
13	1.38" OD	C101520	1.00"	1.015"	1.50"	2.00"	1.00"	0.88"	35,000#
13	1.38" OD	C121520	1.25"	1.265"	1.50"	2.00"	1.25"	0.88"	33,000#
13	1.38" OD	C151520	1.50"	1.515"	1.50"	2.00"	1.50"	0.88"	40,000#
15	1.50" OD	C101220	1.00"	1.015"	1.25"	2.00"	1.00"	0.88"	30,000#
15	1.50" OD	C101520	1.00"	1.015"	1.50"	2.00"	1.00"	0.88"	35,000#
15	1.50" OD	C121520	1.25"	1.265"	1.50"	2.00"	1.25"	0.88"	30,000#
15	1.50" OD	C151520	1.50"	1.515"	1.50"	2.00"	1.50"	0.88"	40,000#
15	1.50" OD	C171525	1.75"	1.765"	1.50"	2.50"	1.75"	0.88"	40,000#
17	1.75" OD	C101720	1.00"	1.015"	1.75"	2.00"	1.00"	0.88"	40,000#
17	1.75" OD	C121720	1.25"	1.265"	1.75"	2.00"	1.25"	0.88"	50,000#
17	1.75" OD	C151725	1.50"	1.515"	1.75"	2.50"	1.50"	0.88"	45,000#
17	1.75" OD	C171725	1.75"	1.765"	1.75"	2.50"	1.75"	0.88"	50,000#
20	2.00" OD	C102020	1.00"	1.015"	2.00"	2.00"	1.00"	0.88"	50,000#
20	2.00" OD	C122020	1.25"	1.265"	2.00"	2.00"	1.25"	0.88"	60,000#
20	2.00" OD	C152025	1.50"	1.515"	2.00"	2.50"	1.50"	0.88"	50,000#
20	2.00" OD	C152525	1.50"	1.515"	2.50"	2.50"	1.50"	0.88"	60,000#
20	2.00" OD	C172025	1.75"	1.765"	2.00"	2.50"	1.75"	0.88"	60,000#
20	2.00" OD	C172525	1.75"	1.765"	2.50"	2.50"	1.75"	0.88"	60,000#
20	2.00" OD	C202025	2.00"	2.015"	2.00"	2.50"	2.00"	0.88"	60,000#
20	2.00" OD	C202525	2.00"	2.015"	2.50"	2.50"	2.00"	0.88"	60,000#
20	2.00" OD	C222025	2.25"	2.265"	2.00"	2.50"	2.25"	0.88"	60,000#
20	2.00" OD	C222525	2.25"	2.265"	2.50"	2.50"	2.25"	0.88"	60,000#
20	2.00" OD	C252027	2.50"	2.515"	2.00"	2.75"	2.50"	0.88"	60,000#
20	2.00" OD	C252527	2.50"	2.515"	2.50"	2.75"	2.50"	0.88"	60,000#
20	2.00" OD	C302030	3.00"	3.067"	2.00"	3.00"	3.00"	0.88"	60,000#
20	2.00" OD	C302530	3.00"	3.067"	2.50"	3.00"	3.00"	0.88"	60,000#

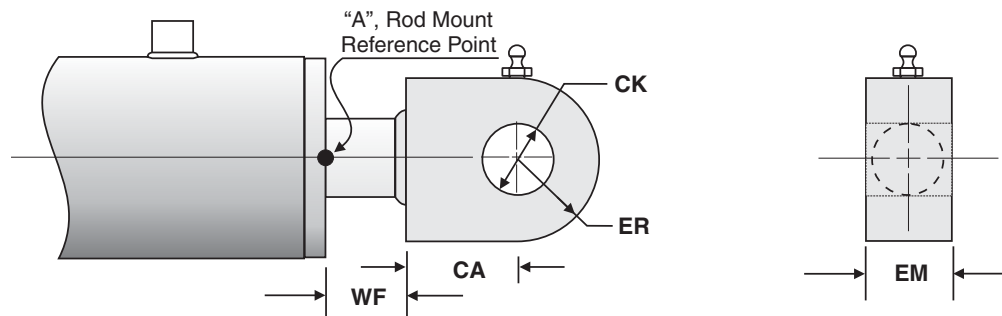
* Max Pull Yield is based on a 2:1 safety factor

Rod Mount Code Description = C Pin Size Width Length

Note: Other mounts sizes available.

Note: Mounts also available with optional bushings.

"C" Rod Mount Code, Lug Rod Mounts

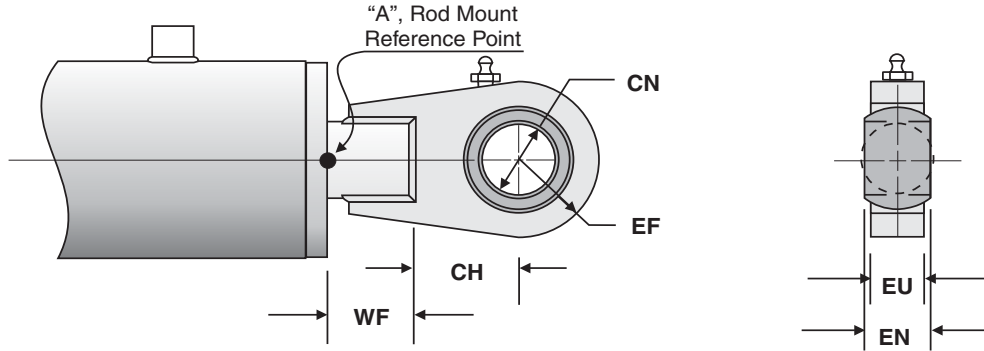


Rod Code	Rod Diameter	Rod Mount Code	Nominal Pin Size	Actual CK	Width EM	Lenght CA	Radius ER	Rod Ext. WF	Max Pull at Yield *
25	2.50" OD	C122520	1.25"	1.265"	2.50"	2.00"	1.25"	0.88"	75,000#
25	2.50" OD	C152525	1.50"	1.515"	2.50"	2.50"	1.50"	0.88"	93,000#
25	2.50" OD	C172525	1.75"	1.765"	2.50"	2.50"	1.75"	0.88"	105,000#
25	2.50" OD	C173025	1.75"	1.765"	3.00"	2.50"	1.75"	0.88"	93,000#
25	2.50" OD	C202525	2.00"	2.015"	2.50"	2.50"	2.00"	0.88"	120,000#
25	2.50" OD	C203025	2.00"	2.015"	3.00"	2.50"	2.00"	0.88"	105,000#
25	2.50" OD	C222525	2.25"	2.265"	2.50"	2.50"	2.25"	0.88"	100,000#
25	2.50" OD	C223025	2.25"	2.265"	3.00"	2.50"	2.25"	0.88"	120,000#
25	2.50" OD	C252527	2.50"	2.515"	2.50"	2.75"	2.50"	0.88"	110,000#
25	2.50" OD	C302730	3.00"	3.062"	2.75"	3.00"	3.00"	0.88"	130,000#
30	3.00" OD	C153025	1.50"	1.515"	3.00"	2.50"	1.25"	0.88"	70,000#
30	3.00" OD	C202025	2.00"	2.015"	2.00"	2.50"	2.00"	0.88"	95,000#
30	3.00" OD	C203025	2.00"	2.015"	3.00"	2.50"	2.00"	0.88"	105,000#
30	3.00" OD	C223025	2.25"	2.265"	3.00"	2.50"	2.25"	0.88"	120,000#
30	3.00" OD	C253027	2.50"	2.515"	3.00"	2.75"	2.50"	0.88"	130,000#
30	3.00" OD	C303030	3.00"	3.062"	3.00"	3.00"	3.00"	0.88"	130,000#
35	3.50" OD	C202025	2.00"	2.015"	2.00"	2.50"	2.00"	0.88"	95,000#
35	3.50" OD	C223025	2.25"	2.260"	3.00"	2.50"	2.25"	0.88"	120,000#
35	3.50" OD	C253027	2.50"	2.515"	3.00"	2.75"	2.50"	0.88"	130,000#
35	3.50" OD	C303030	3.00"	3.062"	3.00"	3.00"	3.00"	0.88"	140,000#
40	4.00" OD	C202025	2.00"	2.015"	2.00"	2.50"	2.00"	0.88"	95,000#
40	4.00" OD	C253027	2.50"	2.565"	3.00"	2.75"	2.50"	0.88"	130,000#
40	4.00" OD	C303030	3.00"	3.062"	3.00"	3.00"	3.00"	0.88"	140,000#
45	4.50" OD	C202025	2.00"	2.015"	2.00"	2.50"	2.00"	0.88"	95,000#
45	4.50" OD	C253027	2.50"	2.565"	3.00"	2.75"	2.50"	0.88"	130,000#
45	4.50" OD	C303030	3.00"	3.015"	3.00"	3.00"	3.00"	0.88"	140,000#

* Max Pull Yield is based on a 2:1 safety factor

Rod Mount Code Description = $\frac{C}{Code} \frac{10}{Pin\ Size} \frac{10}{Width} \frac{20}{Length}$
 Note: Other mounts sizes available.
 Note: Mounts also available with optional bushings.

"SN" Rod Mount Code, Spherical Bearing Narrow Rod Mounts



Rod Code	Rod Diameter	Rod Mount Code	Nominal Pin Size	Actual CN	Bearing Width EN	Lug Width EU	Length CH	Length L1	Radius EF	Rod Ext. WF	Max Pull at Yield
10	1.00" OD	SN100721	1.00"	1.00"	0.88"	0.75"	2.12"	2.75"	1.25"	1.38"	15,000#
11	1.12" OD	SN100721	1.00"	1.00"	0.88"	0.75"	2.12"	2.75"	1.25"	1.38"	15,000#
12	1.25" OD	SN100721	1.00"	1.00"	0.88"	0.75"	2.12"	2.75"	1.25"	1.38"	15,000#
12	1.25" OD	SN120922	1.25"	1.25"	1.09"	0.94"	2.25"	3.00"	1.50"	1.62"	20,000#
13	1.38" OD	SN120922	1.25"	1.25"	1.09"	0.94"	2.25"	3.00"	1.50"	1.62"	20,000#
15	1.50" OD	SN151125	1.50"	1.50"	1.31"	1.12"	2.50"	3.25"	1.88"	1.62"	35,000#
17	1.75" OD	SN120922	1.25"	1.25"	1.09"	0.94"	2.25"	3.00"	1.50"	1.62"	20,000#
17	1.75" OD	SN151125	1.50"	1.50"	1.31"	1.12"	2.50"	3.25"	1.88"	1.62"	35,000#
17	1.75" OD	SN171327	1.75"	1.75"	1.53"	1.31"	2.75"	3.75"	2.00"	1.88"	35,000#
20	2.00" OD	SN120922	1.25"	1.25"	1.09"	0.94"	2.25"	3.00"	1.50"	1.62"	20,000#
20	2.00" OD	SN151125	1.50"	1.50"	1.31"	1.12"	2.50"	3.25"	1.88"	1.88"	35,000#
20	2.00" OD	SN171327	1.75"	1.75"	1.53"	1.31"	2.75"	3.75"	2.00"	1.88"	35,000#
20	2.00" OD	SN201530	2.00"	2.00"	1.75"	1.50"	3.00"	4.00"	2.38"	1.88"	55,000#
25	2.50" OD	SN151125	1.50"	1.50"	1.31"	1.12"	2.50"	3.25"	1.88"	1.62"	35,000#
25	2.50" OD	SN171327	1.75"	1.75"	1.53"	1.31"	2.75"	3.75"	2.00"	1.88"	35,000#
25	2.50" OD	SN201530	2.00"	2.00"	1.75"	1.50"	3.00"	4.00"	2.38"	1.88"	55,000#
25	2.50" OD	SN251935	2.50"	2.50"	2.19"	1.88"	3.50"	4.75"	3.00"	2.12"	95,000#
30	3.00" OD	SN151125	1.50"	1.50"	1.31"	1.12"	2.50"	3.25"	1.88"	1.62"	35,000#
30	3.00" OD	SN171327	1.75"	1.75"	1.53"	1.31"	2.75"	3.75"	2.00"	1.88"	35,000#
30	3.00" OD	SN201530	2.00"	2.00"	1.75"	1.50"	3.00"	4.00"	2.38"	1.88"	55,000#
30	3.00" OD	SN251935	2.50"	2.50"	2.19"	1.88"	3.50"	4.75"	3.00"	2.12"	95,000#
35	3.50" OD	SN151125	1.50"	1.50"	1.31"	1.12"	2.50"	3.25"	1.88"	1.62"	35,000#
35	3.50" OD	SN171327	1.75"	1.75"	1.53"	1.31"	2.75"	3.75"	2.00"	1.88"	35,000#
35	3.50" OD	SN201530	2.00"	2.00"	1.75"	1.50"	3.00"	4.00"	2.38"	1.88"	55,000#
35	3.50" OD	SN251935	2.50"	2.50"	2.19"	1.88"	3.50"	4.75"	3.00"	2.12"	95,000#
40	4.00" OD	SN171327	1.75"	1.75"	1.53"	1.31"	2.75"	3.75"	2.00"	1.88"	35,000#
40	4.00" OD	SN201530	2.00"	2.00"	1.75"	1.50"	3.00"	4.00"	2.38"	1.88"	55,000#
40	4.00" OD	SN251935	2.50"	2.50"	2.19"	1.88"	3.50"	4.75"	3.00"	2.12"	95,000#
40	4.00" OD	SN302242	3.00"	3.00"	2.62"	2.25"	4.25"	5.50"	3.75"	2.12"	120,000#
45	4.50" OD	SN251935	2.50"	2.50"	2.19"	1.88"	3.50"	4.75"	3.00"	2.12"	95,000#
45	4.50" OD	SN302242	3.00"	3.00"	2.62"	2.25"	4.25"	5.50"	3.75"	2.12"	120,000#

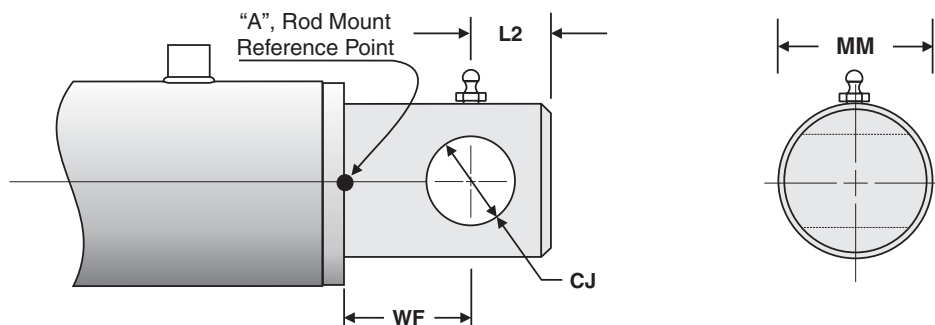
* Max Pull Yield is based on a 2:1 safety factor

Rob Mount SN 10 10 20
Code Description = Code Pin Size Width Length

Note: Other mounts sizes available.

Rod End Mount Code

"B" Rod Mount Code, Drill Thru Rod Mounts



Rod Code	Rod Diameter	Rod Mount Code	Nominal Pin Size	Actual CJ	Diameter MM	Length WF	Length L2	Max Pull at Yield *
10	1.00" OD	B051600	0.50"	0.515"	1.00"	1.62"	0.75"	14,000#
11	1.12" OD	B051600	0.50"	0.515"	1.00"	1.62"	0.75"	16,500#
12	1.25" OD	B051600	0.50"	0.515"	1.00"	1.62"	0.75"	30,000#
12	1.25" OD	B071900	0.75"	0.760"	1.00"	1.88"	0.75"	17,000#
13	1.38" OD	B071900	0.75"	0.760"	1.38"	1.88"	0.75"	24,750#
15	1.50" OD	B071900	0.75"	0.760"	1.50"	1.88"	0.75"	33,800#
15	1.50" OD	B102100	1.00"	1.015"	1.50"	2.12"	1.00"	18,500#
17	1.75" OD	B071900	0.75"	0.760"	1.75"	1.88"	0.75"	55,900#
17	1.75" OD	B102100	1.00"	1.015"	1.75"	2.12"	1.00"	36,700#
20	2.00" OD	B071900	0.75"	0.760"	2.00"	1.88"	0.75"	77,000#
20	2.00" OD	B102100	1.00"	1.015"	2.00"	2.12"	1.00"	60,000#
20	2.00" OD	B122100	1.25"	1.265"	2.00"	2.12"	1.25"	39,500#
25	2.50" OD	B102100	1.00"	1.015"	2.50"	2.12"	1.00"	77,000#
25	2.50" OD	B122100	1.25"	1.265"	2.50"	2.12"	1.25"	77,000#
25	2.50" OD	B152400	1.50"	1.515"	2.50"	2.37"	1.50"	68,000#
30	3.00" OD	B102100	1.00"	1.015"	3.00"	2.12"	1.00"	140,000#
30	3.00" OD	B122100	1.25"	1.265"	3.00"	2.12"	1.25"	140,000#
30	3.00" OD	B152400	1.50"	1.515"	3.00"	2.37"	1.50"	140,000#
35	3.50" OD	B122100	1.25"	1.265"	3.50"	2.12"	1.25"	140,000#
35	3.50" OD	B152400	1.50"	1.515"	3.50"	2.37"	1.50"	140,000#
35	3.50" OD	B202600	2.00"	2.031"	3.50"	2.62"	2.00"	136,000#
40	4.00" OD	B122100	1.25"	1.265"	4.00"	2.12"	1.25"	140,000#
40	4.00" OD	B152400	1.50"	1.515"	4.00"	2.37"	1.50"	140,000#
40	4.00" OD	B202600	2.00"	2.031"	4.00"	2.62"	2.00"	140,000#
45	4.50" OD	B152400	1.50"	1.515"	4.50"	2.37"	1.50"	140,000#
45	4.50" OD	B202600	2.00"	2.031"	4.50"	2.62"	2.00"	140,000#
45	4.50" OD	B253100	2.50"	2.562"	4.50"	3.12"	2.50"	140,000#

* Max Pull Yield is based on a 2:1 safety factor

Rod Mount Code Description = **B** **10** **21** **00**
 Code Pin Size Length Filler

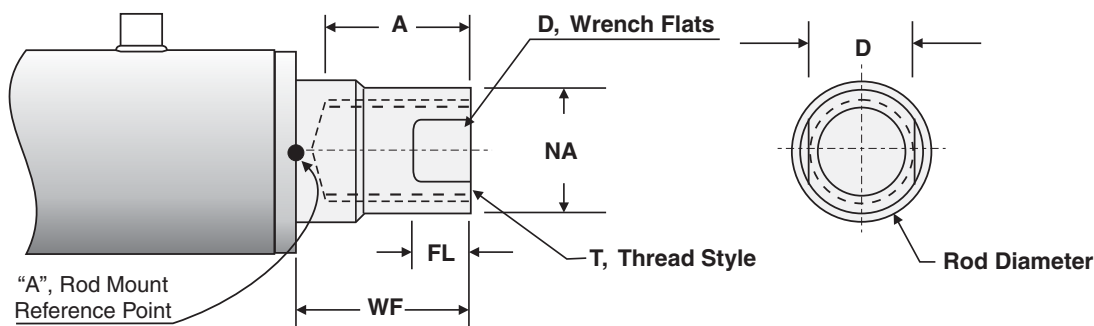
Note: Other mounts sizes available.

Note: Mounts also available with optional bushings.

Rod End Mount Code

"N" Rod Mount Code, Female Thread Rod Mounts

Some sizes dimensionally interchangeable with NFPA Style SF



Rod Code	Rod Diameter	Rod Mount Code	Thread Style T	Length A	Wrench Flats FL	Wrench Flats D	End Rod NA	Rod Ext. WF	Max Pull at Yield *	NFPA Style
10	1.00" OD	N082017	1/2"-20	1.75"	0.38"	0.88"	NA	1.50"	16,500#	
10	1.00" OD	N121611	3/4"-16	1.12"	0.38"	0.88"	0.94"	1.50"	16,500#	SF
11	1.12" OD	N121611	3/4"-16	1.12"	0.38"	0.88"	1.06"	1.50"	16,500#	
12	1.25" OD	N121611	3/4"-16	1.12"	0.38"	0.88"	1.12"	1.50"	39,000#	
13	1.38" OD	N161416	1"-14	1.62"	0.62"	1.12"	1.31"	1.50"	35,000#	SF
15	1.50" OD	N121611	3/4"-16	1.12"	0.38"	0.88"	1.31"	1.50"	41,000#	
15	1.50" OD	N161416	1"-14	1.62"	0.62"	1.12"	1.31"	1.50"	41,000#	
17	1.75" OD	N201220	1-1/4"-12	2.00"	0.88"	1.50"	1.69"	1.75"	58,900#	SF
20	2.00" OD	N241222	1-1/2"-12	2.25"	0.75"	1.50"	1.94"	1.75"	68,700#	SF
25	2.50" OD	N301230	1-7/8"-12	3.00"	1.00"	2.06"	2.38"	2.00"	77,000#	SF
30	3.00" OD	N361235	2-1/4"-12	3.50"	1.00"	2.62"	2.88"	2.00"	102,000#	SF
35	3.50" OD	N401235	2-1/2"-12	3.50"	1.00"	3.00"	3.38"	2.00"	140,000#	SF
40	4.00" OD	N481240	3"-12	4.00"	1.00"	3.38"	3.88"	2.00"	140,000#	SF
45	4.50" OD	N521245	3-1/4"-12	4.50"	1.00"	4.00"	4.38"	2.00"	140,000#	SF

* Max Pull Yield is based on a 2:1 safety factor

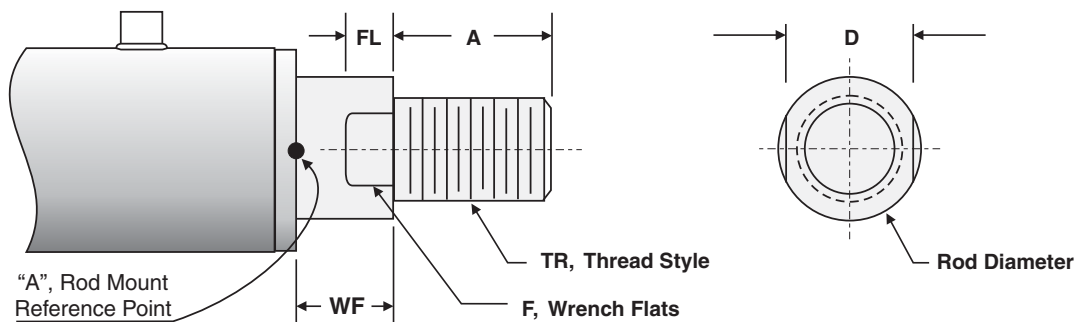
Note: Usually, a female thread is recommended over a male thread because a broken end can be easily replaced as opposed to changing a rod that had a male thread. Also, a female thread can be converted to a male thread by using a rod stud (consult factory for rod stud options).

Rod Mount Code Description = $\frac{N}{Code} \frac{08}{Diameter} \frac{20}{Pitch} \frac{17}{Depth}$
 Note: Other mounts sizes available.

Rod End Mount Code

"E" Rod Mount Code, Male Thread Rod Mounts

Some sizes dimensionally interchangeable with NFPA Style IM & SM



Rod Code	Rod Diameter	Rod Mount Code	Thread Style TR	Length A	Wrench Flats FL	Wrench Flats D	Rod Ext. WF	Max Pull at Yield *	NFPA Style
10	1.00" OD	E121612	3/4"-16	1.12"	0.50"	0.88"	1.00"	16,500#	SM
10	1.00" OD	E141416	7/8"-14	1.62"	0.50"	0.88"	1.00"	16,500#	IM
10	1.00" OD	E161416	1"-14	1.62"	0.62"	0.88"	1.12"	16,500#	
11	1.12" OD	E161416	1"-14	1.62"	0.62"	1.00"	1.12"	16,500#	
11	1.12" OD	E161220	1"-12	2.00"	0.31"	1.00"	0.81"	16,500#	
12	1.25" OD	E201216	1-1/4"-12	1.62"	0.62"	1.12"	1.12"	41,000#	
13	1.38" OD	E161416	1"-14	1.62"	0.62"	1.12"	1.12"	32,000#	SM
13	1.38" OD	E201216	1-1/4"-12	1.62"	0.62"	1.12"	1.12"	41,000#	IM
15	1.50" OD	E161416	1"-14	1.62"	0.62"	1.25"	1.12"	32,000#	
15	1.50" OD	E201216	1-1/4"-12	1.62"	0.62"	1.25"	1.12"	41,000#	
15	1.50" OD	E221212	1-3/8"-12	1.19"	0.43"	1.25"	0.94"	41,000#	
17	1.75" OD	E201220	1-1/4"-12	2.00"	0.75"	1.50"	1.25"	52,000#	SM
17	1.75" OD	E241220	1-1/2"-12	2.00"	0.75"	1.50"	1.25"	71,000#	IM
20	2.00" OD	E241222	1-1/2"-12	2.25"	0.88"	1.69"	1.38"	77,000#	SM
20	2.00" OD	E281222	1-3/4"-12	2.25"	0.88"	1.69"	1.38"	77,000#	IM
20	2.00" OD	E320832	2"-8	3.25"	0.75"	1.75"	1.25"	77,000#	
20	2.00" OD	E321228	2"-12	2.88"	1.00"	1.75"	1.50"	77,000#	
25	2.50" OD	E301230	1-7/8"-12	3.00"	1.00"	2.06"	1.50"	77,000#	SM
25	2.50" OD	E361230	2-1/4"-12	3.00"	1.00"	2.06"	1.50"	77,000#	IM
30	3.00" OD	E361235	2-1/4"-12	3.50"	1.00"	2.62"	1.50"	141,000#	SM
30	3.00" OD	E441235	2-3/4"-12	3.50"	1.00"	2.62"	1.50"	141,000#	IM
35	3.50" OD	E401235	2-1/2"-12	3.50"	1.00"	3.00"	1.50"	141,000#	SM
35	3.50" OD	E521235	3-1/4"-12	3.50"	1.00"	3.00"	1.50"	141,000#	IM
40	4.00" OD	E481240	3"-12	4.00"	1.00"	3.38"	1.50"	141,000#	SM
40	4.00" OD	E601240	3-3/4"-12	4.00"	1.00"	3.38"	1.50"	141,000#	IM
45	4.50" OD	E521245	3-1/4"-12	4.50"	1.00"	4.00"	1.50"	141,000#	SM

* Max Pull Yield is based on a 2:1 safety factor

Rod Mount Code Description = E 08 20 17
Code Diameter Pitch Depth

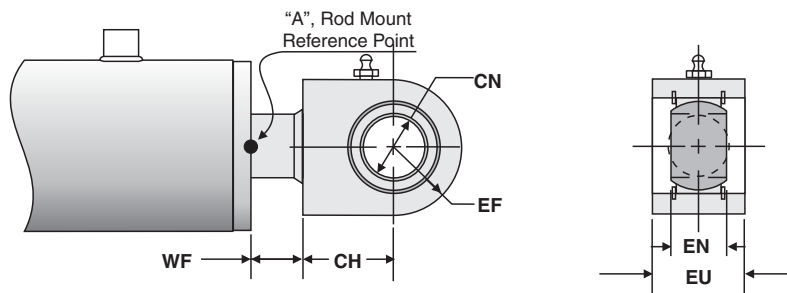
Note: Other mounts sizes available.

Rod End Mount Code

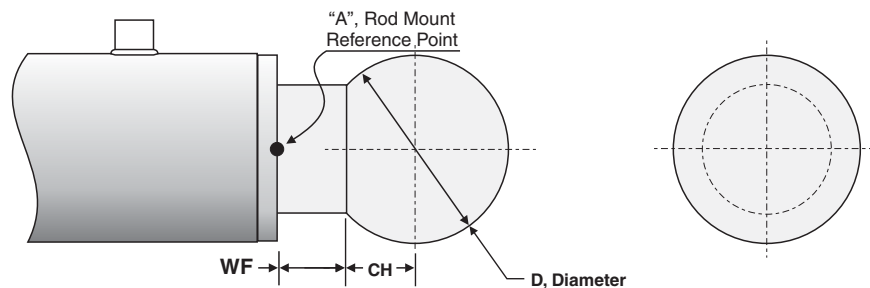
Other mounting options available upon request:

Please contact sales office for availability.

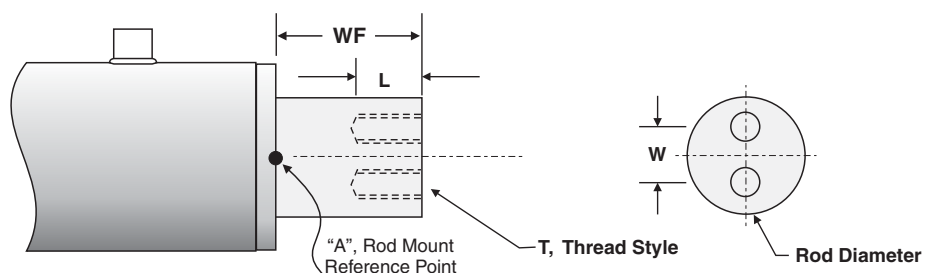
"SW" Rod Mount Code, Spherical Bearing Wide Rod Mounts



"Z" Rod Mount Code, Ball Type Rod Mounts



"F" Rod Mount Code, Drilled & Tapped 2 or More Holes Rod Mounts



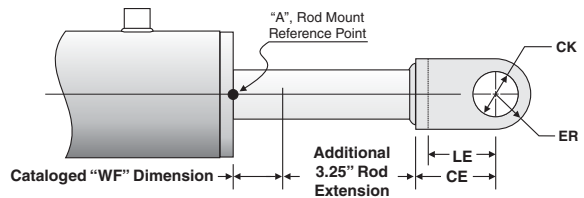
Rod Extension, Stop Tube and Ports

Rod Extension: (default is 0.000)

Enter amount of additional rod extension required in inches if other than the standard catalog "WF" dimension.

Example 3.250" Rod Extension

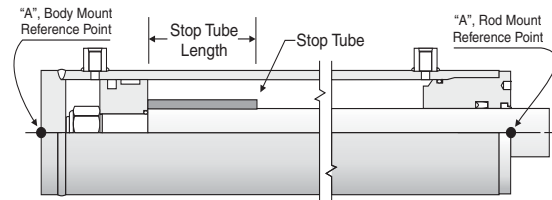
Note: This will effect over all Closed Length and Open Length by the additional Rod Extension, but will NOT affect the Stroke.



Stop Tube Length: (default is 0.000)

Enter length of stop tube required in inches, example 3.250".

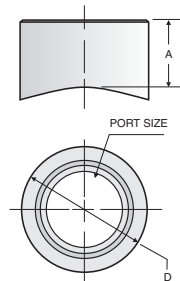
Note: This will effect the over all Stroke and the Open dimensions, but will NOT affect the Closed length. (Example; "A" = 6.56" + Stroke of 20" = 26.56" Closed and 46.56" Open Length, add 3.250" Stop Tube 26.56" Closed remains the same but Open Length becomes 43.31".



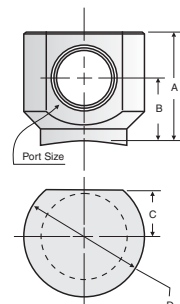
Port Code, Extend Cap Port and Retract Head Port:

Enter Port Code

Port Code	Port Size & Type	A	B	C	D	WMD Availability	WHD Availability
TS04	#4 SAE	0.63"	-	-	0.75"	2.00"-5.00"	N/A
TS06	#6 SAE	0.75"	-	-	1.00"	2.00"-5.00"	3.00"-5.50"
TS08	#8 SAE	0.81"	-	-	1.12"	2.00"-5.00"	3.00"-8.00"
TS10	#10 SAE	0.78"	-	-	1.25"	5.00"	3.00"-8.00"
TS12	#12 SAE	0.78"	-	-	1.50"	5.00"	3.00"-8.00"
TS16	#16 SAE	0.96"	-	-	2.00"	N/A	4.50"-8.00"
TS20	#20 SAE	0.88"	-	-	2.25"	N/A	8.00"
US04	1/4" NPT	0.69"	-	-	0.75"	2.00"-5.00"	N/A
US06	3/8" NPT	0.75"	-	-	1.25"	2.00"-5.00"	3.00"-5.50"
US08	1/2" NPT	0.88"	-	-	1.13"	2.00"-5.00"	3.00"-8.00"
US12	3/4" NPT	0.94"	-	-	1.38"	5.00"	3.00"-8.00"
US16	1" NPT	1.13"	-	-	1.75"	N/A	4.50"-8.00"
US20	1 1/4" NPT	1.19"	-	-	2.25"	N/A	8.00"



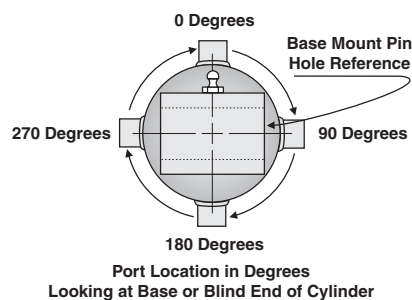
Port Code	Port Size & Type	A	B	C	D	WMD Availability	WHD Availability
TE04	#4 SAE Elbow	1.13"	0.75"	0.44"	1.13"	2.00"-5.00"	N/A
TE06	#6 SAE Elbow	1.25"	0.81"	0.50"	1.25"	2.00"-5.00"	3.00"-5.50"
TE08	#8 SAE Elbow	1.57"	0.95"	0.63"	1.63"	2.00"-5.00"	3.00"-8.00"
TE10	#10 SAE Elbow	1.81"	1.05"	0.69"	1.75"	5.00"	3.00"-8.00"
TE12	#12 SAE Elbow	1.93"	1.12"	0.81"	2.12"	5.00"	3.00"-8.00"
TE16	#16 SAE Elbow	2.31"	1.31"	0.81"	2.25"	N/A	4.50"-8.00"
TE20	#20 SAE Elbow	2.56"	1.56"	0.88"	2.63"	N/A	8.00"
UE04	1/4" NPT Elbow	1.03"	0.65"	0.41"	1.00"	2.00"-5.00"	N/A
UE06	3/8" NPT Elbow	1.20"	0.75"	0.50"	1.25"	2.00"-5.00"	3.00"-5.50"
UE08	1/2" NPT Elbow	1.57"	0.95"	0.69"	1.63"	2.00"-5.00"	3.00"-8.00"
UE12	3/4" NPT Elbow	1.94"	1.13"	0.81"	2.00"	5.00"	3.00"-8.00"
UE16	1" NPT Elbow	2.31"	1.31"	0.81"	2.25"	N/A	4.50"-8.00"
UE20	1 1/4" NPT Elbow	2.56"	1.56"	0.94"	2.63"	N/A	8.00"



Note: Unless otherwise specified as a "SR" Option, 90-degree elbows the port will face the base of cylinder.

Port Location, Extend, Cap and Retract, Head:

Enter location in degrees in reference to base or blind end lug.



Please contact the factory for following options other than "N"

Rod and Base Mount Bushings

Special Seals

Special Rod Coatings (Nitrated, Stainless, Electroless Nickel-Plated)

Non Cataloged Mounts

Non Cataloged Porting

Air Bleeds

Flow Tubes

Lift Lugs

Pad Support Mounts

Position Sensing

Proximity Switch

Special Porting

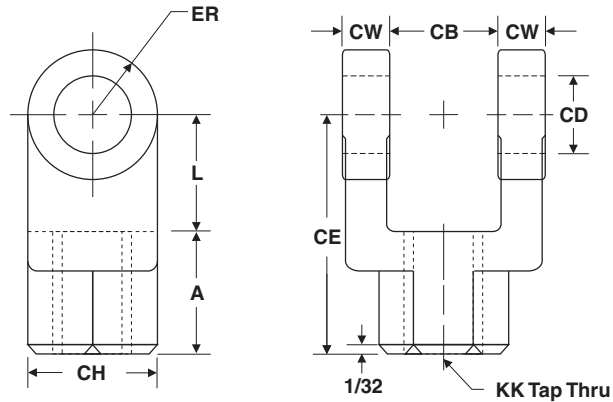
Special Valving (Counterbalance, Holding, Lock)

Rod End Bellows

Cylinder Mounting Accessories

Rod Clevis

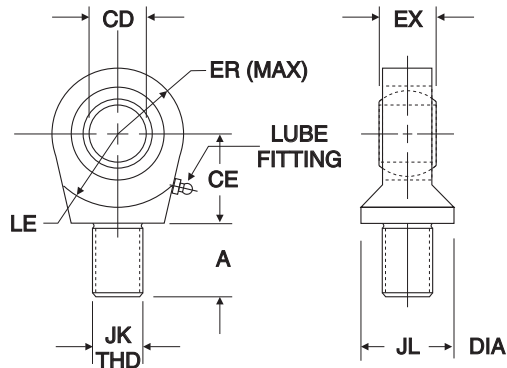
Material: CD 1/2, 3/4, 1 Forging, 1-3/8 & Up Ductile Iron Casting



Part No.	CB	CD	CE	CH	CW	L	A	KK	ER
3753035079	0.765	1/2	1-1/2	1	1/2	3/4	3/4	7/16-20	1/2
3753035080	1.265	3/4	2-3/8	1-1/4	5/8	1-1/4	1-1/8	3/4-16	3/4
3753035081	1.515	1	3-1/8	1-1/2	3/4	1-1/2	1-5/8	1-14	1
3753035082	2.032	1-3/8	4-1/8	2	1	2-1/8	2	1-1/4-12	1-3/8
3753035084	2.531	1-3/4	4-1/2	2-3/8	1-1/4	2-1/4	2-1/4	1-1/2-12	1-3/4
3753035085	2.531	2	5-1/2	2-15/16	1-1/4	2-1/2	3	1-7/8-12	2
3753035086	3.032	2-1/2	6-1/2	3-1/2	1-1/2	3	3-1/2	2-1/4-12	2-1/2
3753035087	3.032	3	6-3/4	3-7/8	1-1/2	3-1/4	3-1/2	2-1/2-12	2-3/4
3753035088	4.032	3-1/2	8-1/2	5	2	4	4-1/2	3-1/4-12	3-1/2
3753035089	4.532	4	10	6-1/8	2-1/4	4-1/2	5-1/2	4-12	4

Spherical Rod Eye

Material: Forging, Weldment, or Ductile Iron

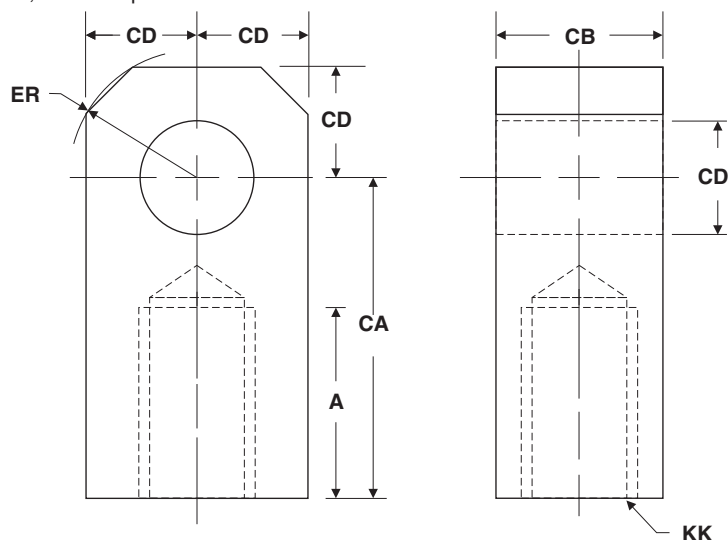


Part No.	CD	A	CE	EX	ER	LE	JK	JL Ref.	Load Cap.	Spacer Width
3753035192	0.500	11/16	7/8	7/16	7/8	3/4	7/16-20	7/8	2,600	.150
3753035193	0.750	1	1-1/4	21/32	1-1/4	1-1/16	3/4-16	1-5/16	9,400	.250
3753035194	1.000	1-1/2	1-7/8	7/8	1-3/8	1-7/16	1-14	1-1/2	16,800	.250
3753035195	1.375	2	2-1/8	1-3/16	1-13/16	1-7/8	1-1/4-12	2	28,600	.375
3753035196	1.750	2-1/8	2-1/2	1-17/32	2-3/16	2-1/8	1-1/2-12	2-1/4	43,000	.416
3753035197	2.000	2-7/8	2-3/4	1-3/4	2-5/8	2-1/2	1-7/8-12	2-3/4	70,000	.375

Cylinder Mounting Accessories

Rod Eyes

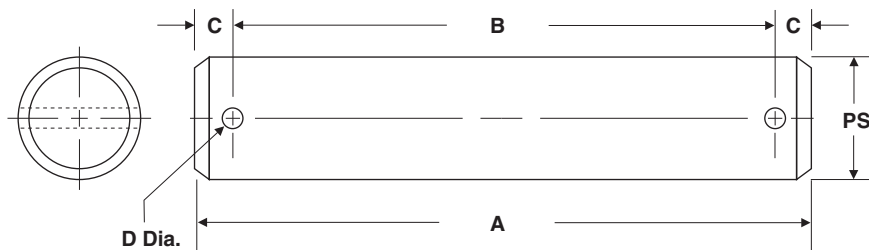
Material: CD 1/2 thru 1-3/8 C.F. Bar, 1-3/4 & Up Steel Plate



Part No.	A	CA	CB	CD	ER	KK
3753035096	3/4	1-1/2	3/4	1/2	5/8	7/16-20
3753035097	1-1/8	2-1/16	1-1/4	3/4	7/8	3/4-16
3753035098	1-5/8	2-13/16	1-1/2	1	1-3/16	1-14
3753035099	2	3-7/16	2	1-3/8	1-9/16	1-1/4-12
3753035100	2-1/4	4	2-1/2	1-3/4	2	1-1/2-12
3753035101	3	5	2-1/2	2	2-1/2	1-7/8-12
3753035102	3-1/2	5-13/16	2	2-1/2	2-13/16	2-1/4-12
3753035103	3-1/2	6-1/8	3	3	3-1/4	2-1/2-12
3753035104	4-1/2	7-5/8	4	3-1/2	3-7/8	3-1/4-12
3753035105	5-1/2	9-1/8	4-1/2	4	4-7/16	4-12

Pivot Pin

Material: 1144 Steel Nitrotec Treated Surface

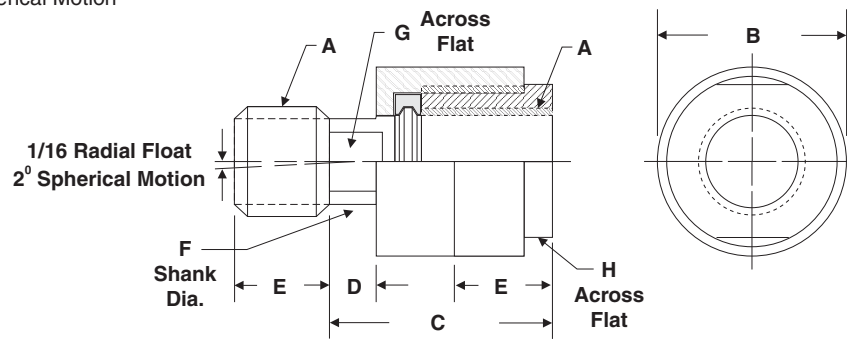


Part No.	Pin Size	A	B	C	D
3757244002	0.500	2.281	1.938	.172	.106
3757244003	0.750	3.094	2.719	.188	.140
3757244004	1.000	3.594	3.219	.188	.140
3757244005	1.375	4.656	4.250	.203	.173
3757244006	1.750	5.656	5.250	.203	.173
3757244007	2.000	5.719	5.281	.219	.201
3757244008	2.500	6.781	6.313	.234	.219
3757244009	3.000	6.844	6.344	.250	.250
3757244010	3.500	8.969	8.406	.282	.312
3757244011	4.000	9.969	9.406	.282	.321

Cylinder Mounting Accessories

Alignment Coupler

1/16 Radial Float 2° Spherical Motion

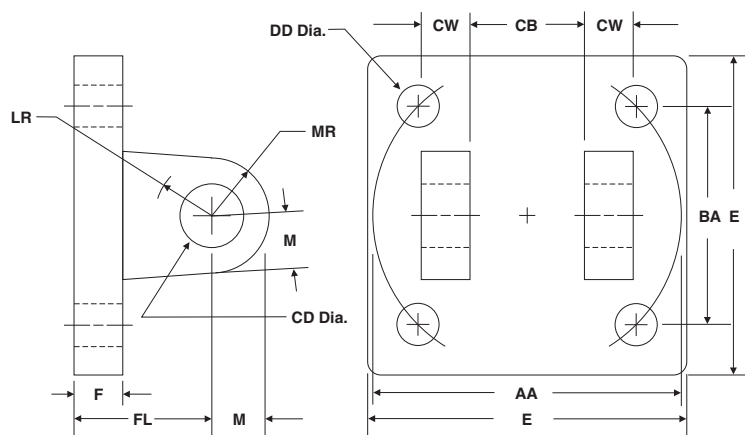


Part No.	A	B	C	D	E	F	G	H	Max. Pull at Yield
3753035078	1/4-28	7/8	1-1/4	1/4	5/8	5/16	3/16	3/4	6,000
3750484033	5/16-24	7/8	1-1/4	1/4	5/8	5/16	1/4	3/4	8,300
3750484034	3/8-24	7/8	1-1/4	1/4	5/8	5/16	5/16	3/4	8,300
3750484035	3/8-16	7/8	1-1/4	1/4	5/8	5/16	5/16	3/4	5,000
3750484036	7/16-20	1-1/4	2	1/2	3/4	5/8	1/2	1	10,000
3750484037	1/2-20	1-1/4	2	1/2	3/4	5/8	1/2	1	14,000
3750484038	1/2-13	1-1/4	2	1/2	3/4	5/8	1/2	1	14,000
3750484039	5/8-18	1-1/4	2	1/2	3/4	5/8	1/2	1	19,000
3750484040	3/4-16	1-3/4	2-5/16	1/2	1-1/8	31/32	13/16	1-1/2	34,000
3750484041	3/4-10	1-3/4	2-5/16	1/2	1-1/8	31/32	13/16	1-1/2	34,000
3750484042	7/8-14	1-3/4	2-5/16	1/2	1-1/8	31/32	13/16	1-1/2	39,000
3750484029	1-14	2-1/2	2-15/16	1/2	1-5/8	1-3/8	1-5/32	2-1/4	64,000
3750484030	1-1/4-12	2-1/2	2-15/16	1/2	1-5/8	1-3/8	1-5/32	2-1/4	78,000
3750484031	1-1/2-12	3-1/4	4-3/8	13/16	2-1/4	1-3/4	1-1/2	3	134,000
3753035077	1-3/4-12	3-1/4	4-3/8	13/16	2-1/4	1-3/4	1-1/2	3	134,000
3750484032	1-7/8-12	3-3/4	5-7/16	7/8	3	2	1-7/8	3-1/2	240,000
3750484044	2-12	3-3/4	5-7/16	7/8	3	2	1-7/8	3-1/2	240,000

Cylinder Mounting Accessories

Clevis Bracket

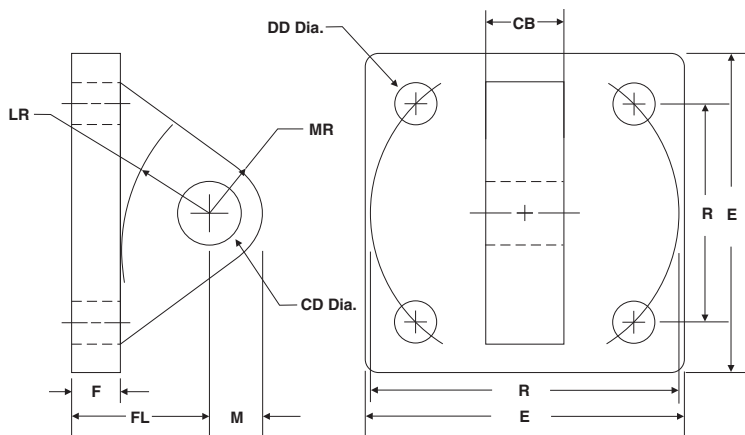
Material: Forging, Weldment, or Ductile Iron



Part No.	AA	BA	CB	CD	CW	DD	E	F	FL	LR	M	MR
3753035090	2.3	1-5/8	0.765	1/2	1/2	3/8-24	2-1/2	3/8	1-1/8	1/2	1/2	9/16
3753035091	2.9	2-1/16	1.265	3/4	5/8	1/2-20	3	5/8	1-7/8	1	3/4	1-1/16
3753035092	3.6	2-9/16	1.265	3/4	5/8	1/2-20	3-1/2	5/8	1-7/8	1-1/16	3/4	1-1/16
3753035093	4.6	3-1/4	1.515	1	3/4	5/8-18	4-1/2	3/4	2-1/4	1-1/4	1	1-1/8
3753035094	5.4	3-13/16	2.032	1-3/8	1	5/8-18	5	7/8	3	1-7/8	1-3/8	1-3/4
3753035095	8.1	5-3/4	2.531	2	1-1/4	1-14	7-1/2	1	3-1/2	2-1/8	2	2-1/8

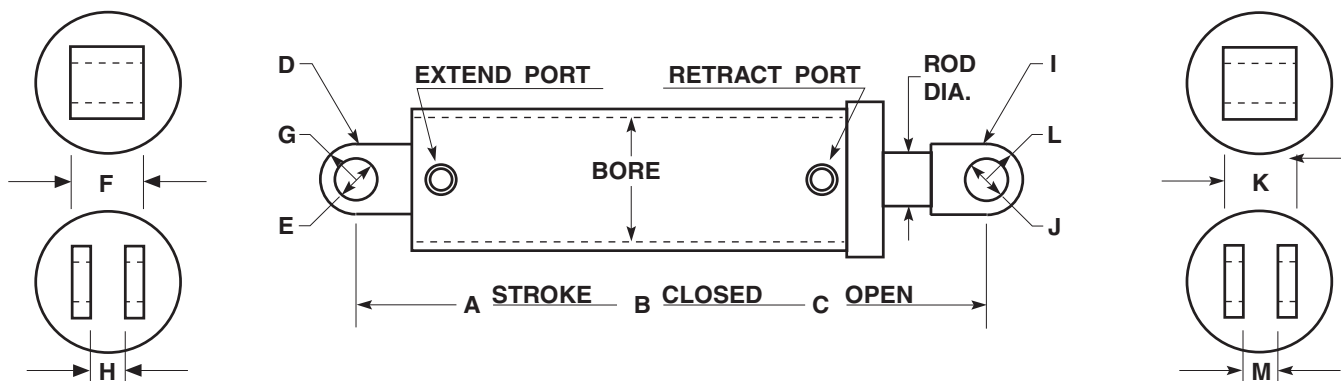
Eye Bracket

Material: Forging, Weldment, or Ductile Iron



Part No.	CB	CD	DD	E	F	FL	LR	M	MR	R
3753035106	3/4	1/2	13/32	2-1/2	3/8	1-1/8	3/4	1/2	9/16	1.63
3753035107	1-1/4	3/4	17/32	3-1/2	5/8	1-7/8	1-1/4	3/4	7/8	2.56
3753035108	1-1/2	1	21/32	4-1/2	3/4	2-1/4	1-1/2	1	1-1/4	3.25
3753035109	2	1-3/8	21/32	5	7/8	3	2-1/8	1-3/8	1-5/8	3.81
3753035110	2-1/2	1-3/4	29/32	6-1/2	7/8	3-1/8	2-1/4	1-3/4	2-1/8	4.95
3753035111	2-1/2	2	1-1/16	7-1/2	1	3-1/2	2-1/2	2	2-7/16	5.75
3753035112	3	2-1/2	1-3/16	8-1/2	1	4	3	2-1/2	3	6.59
3753035113	3	3	1-5/16	9-1/2	1	4-1/4	3-1/4	3	3-1/4	7.50

Piston Rod Cylinder Application Data Form



Cylinder application _____

Single- or Double-acting _____ System operating pressure Normal ____ Max. ____

Bore _____ Is there a relief valve in system ____ Setting ____

Rod diameter _____ System flow in G.P.M. Min. ____ Max. ____

Head & gland design _____ System operating temp. Normal ____ Max. ____

Piston design _____ Fluid type _____

Mounting conditions ____ Vert. ____ Horz. ____ Incline angle ____ Load holding requirements _____

Any side or eccentric loading possible _____ Environmental condition _____

A : Total stroke _____

B : Closed length _____

C : Open length _____

D : Base mount type or code _____

E : Base pin diameter _____

F : Base mount width _____

G : Base mount radius _____

H : Base Clevis Gap (if applicable) _____

I : Plunger mount type or code _____

J : Plunger pin diameter _____

K : Plunger mount width _____

L : Plunger mount radius _____

M : Plunger clevis gap (if applicable) _____

Special mounting (if applicable) _____

Extend port size and type _____ Extend port location _____

Retract port size and type _____ Retract port location _____

Special features or comments _____

Requested by: Firm _____ Current Quan. _____

Address _____ Future Quan. _____

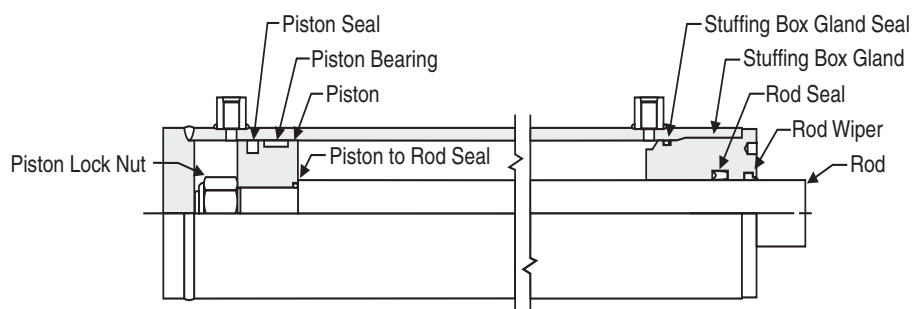
City _____ State _____ Zip _____

Phone _____ Fax _____

Contact _____

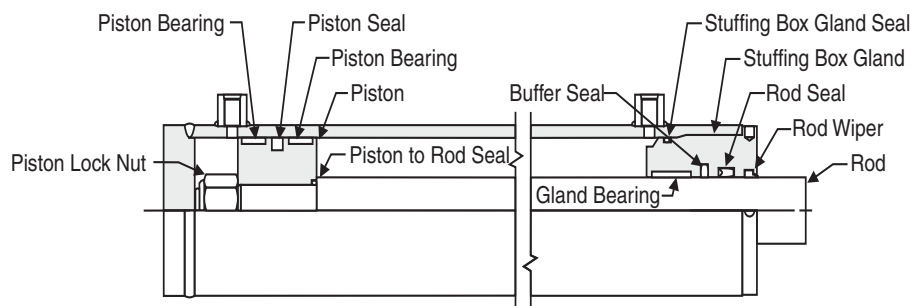
Phone: (800) 848-5575 * 330-480-8431 * Fax (800) 694-3392 * 330-480-8432

Service Parts and Rebuild Kits for "M" Series



WMD Series	Bore Size	Rod Dia.	Seal Kit Part Number	Stuffing Box Part Number	Piston Part Number	Piston Nut Part Number
M-P-20-10-N	2.00	1.000	3751805283	BM02010020	PM02001012	3911457008
M-P-20-11-N	"	1.125	3751805284	BM02011220	"	"
M-P-20-12-N	"	1.250	3751805285	BM02012520	"	"
M-P-25-10-N	2.50	1.000	3751805288	BM02510022	PM25012516	3911457008
M-P-25-11-N	"	1.125	3751805289	BM02511222	"	"
M-P-25-12-N	"	1.250	3751805290	BM02512522	"	"
M-P-25-13-N	"	1.375	3751805291	BM02513822	"	"
M-P-25-15-N	"	1.500	3751805292	BM02515022	"	"
M-P-25-17-N	"	1.750	3751805293	BM02517522	"	"
M-P-30-10-N	3.00	1.000	3751805295	BM03010022	PM30015019S	3911457008
M-P-30-11-N	"	1.125	3751805296	BM03011222	"	"
M-P-30-12-N	"	1.250	3751805297	BM03012522	"	"
M-P-30-13-N	"	1.375	3751805298	BM03013822	"	"
M-P-30-15-N	"	1.500	3751805299	BM03015022	"	"
M-P-30-17-N	"	1.750	3751805300	BM03017522	"	"
M-P-30-20-N	"	2.000	3751805301	BM03020022	"	"
M-P-32-12-N	3.25	1.250	3751805302	BM03212522	PM32015024	3911457010
M-P-32-13-N	"	1.375	3751805303	BM03213822	"	"
M-P-32-15-N	"	1.500	3751805304	BM03215022	"	"
M-P-32-17-N	"	1.750	3751805305	BM03217522	"	"
M-P-32-20-N	"	2.000	3751805306	BM03220022	"	"
M-P-35-12-N	3.50	1.250	3751805307	BM03512525	PM35015024S	3911457010
M-P-35-13-N	"	1.375	3751805308	BM03513825	"	"
M-P-35-15-N	"	1.500	3751805309	BM03515025	"	"
M-P-35-17-N	"	1.750	3751805310	BM03517525	"	"
M-P-35-20-N	"	2.000	3751805311	BM03520025	"	"
M-P-35-25-N	"	2.500	3751805313	BM03525025	"	"
M-P-40-13-N	4.00	1.375	3751805314	BM04013825	PM40015024	3911457010
M-P-40-15-N	"	1.500	3751805315	BM04015025	"	"
M-P-40-17-N	"	1.750	3751805316	BM04017525	"	"
M-P-40-20-N	"	2.000	3751805317	BM04020025	"	"
M-P-40-25-N	"	2.500	3751805319	BM04025025	"	"
M-P-40-30-N	"	3.000	3751805320	BM04030025	"	"
M-P-45-17-N	4.50	1.750	3751805321	BM04517525	PM45015025S	3911457011
M-P-45-20-N	"	2.000	3751805322	BM04520025	"	"
M-P-45-25-N	"	2.500	3751805324	BM04525025	"	"
M-P-45-30-N	"	3.000	3751805325	BM04530025	"	"
M-P-45-35-N	"	3.500	3751805326	BM04535025	"	"
M-P-50-20-N	5.00	2.000	3751805327	BM05020025	PM50015030	3751457002
M-P-50-25-N	"	2.500	3751805329	BM05025025	"	"
M-P-50-30-N	"	3.000	3751805330	BM05030025	"	"
M-P-50-35-N	"	3.500	3751805331	BM05035025	"	"
M-P-50-40-N	"	4.000	3751805332	BM05040025	"	"

Service Parts and Rebuild Kits for "H" Series



WHD Series	Bore Size	Rod Dia.	Seal Kit Part Number	Stuffing Box Part Number	Piston Part Number	Piston Nut Part Number
H-P-30-13-N	3.00	1.375	3751805366	BH03013830	PH30020021	3751457001
H-P-30-15-N	"	1.500	3751805367	BH03015030	"	"
H-P-30-17-N	"	1.750	3751805368	BH03017530	"	"
H-P-30-20-N	"	2.000	3751805369	BH03020030	"	"
H-P-32-12-N	3.25	1.250	3751805370		PH32020023	3911451010
H-P-32-13-N	"	1.375	3751805371		"	"
H-P-32-15-N	"	1.500	3751805372		"	"
H-P-32-17-N	"	1.750	3751805373		"	"
H-P-32-20-N	"	2.000	3751805374		"	"
H-P-35-12-N	3.50	1.250	3751805375	BH03512530	PH35020025	3911457011
H-P-35-13-N	"	1.375	3751805376	BH03513830	"	"
H-P-35-15-N	"	1.500	3751805377	BH03515030	"	"
H-P-35-17-N	"	1.750	3751805378	BH03517530	"	"
H-P-35-20-N	"	2.000	3751805379	BH03520030	"	"
H-P-35-25-N	"	2.500	3751805381	BH03525030	"	"
H-P-40-13-N	4.00	1.375	3751805382	BH04013835	PH40020025	3911457011
H-P-40-15-N	"	1.500	3751805383	BH04015035	"	"
H-P-40-17-N	"	1.750	3751805384	BH04017535	"	"
H-P-40-20-N	"	2.000	3751805385	BH04020035	"	"
H-P-40-25-N	"	2.500	3751805387	BH04025035	"	"
H-P-40-30-N	"	3.000	3751805388	BH04030035	"	"
H-P-45-17-N	4.50	1.750	3751805389	BH04517535	PH45020030	3751457002
H-P-45-20-N	"	2.000	3751805390	BH04520035	"	"
H-P-45-25-N	"	2.500	3751805392	BH04525035	"	"
H-P-45-30-N	"	3.000	3751805393	BH04530035	"	"
H-P-45-35-N	"	3.500	3751805394	BH04535035	"	"
H-P-50-20-N	5.00	2.000	3751805395	BH05020037	PH50020035	3911457013
H-P-50-25-N	"	2.500	3751805397	BH05025037	"	"
H-P-50-30-N	"	3.000	3751805398	BH05030037	"	"
H-P-50-35-N	"	3.500	3751805399	BH05035037	"	"
H-P-50-40-N	"	4.000	3751805400	BH05040037	"	"
H-P-55-25-N	5.50	2.500	3751805401	BH05525037	PH55021240S	3911457013
H-P-55-30-N	"	3.000	3751805402	BH05530037	"	"
H-P-55-35-N	"	3.500	3751805403	BH05535037	"	"
H-P-55-40-N	"	4.000	3751805404	BH05540037	"	"
H-P-55-45-N	"	4.500	3751805405	BH05545037	"	"
H-P-60-25-N	6.00	2.500	3751805406	BH06025037	PH60021245S	3751457046
H-P-60-30-N	"	3.000	3751805407	BH06030037	"	"
H-P-60-35-N	"	3.500	3751805408	BH06035037	"	"
H-P-60-40-N	"	4.000	3751805409	BH06040037	"	"
H-P-60-45-N	"	4.500	3751805410	BH06045037	"	"
H-P-70-25-N	7.00	2.500	3751805411	BH07025042	PH70021245	3751457050
H-P-70-30-N	"	3.000	3751805412	BH07030042	"	"
H-P-70-35-N	"	3.500	3751805413	BH07035042	"	"
H-P-70-40-N	"	4.000	3751805414	BH07040042	"	"
H-P-70-45-N	"	4.500	3751805415	BH07045042	"	"
H-P-80-35-N	8.00	3.500	3751805416	BH08035042	PH80031249	3751457050
H-P-80-40-N	"	4.000	3751805417	BH08040042	"	"
H-P-80-45-N	"	4.500	3751805418	BH08045042	"	"

WMD and WHD Series Disassembly Instructions

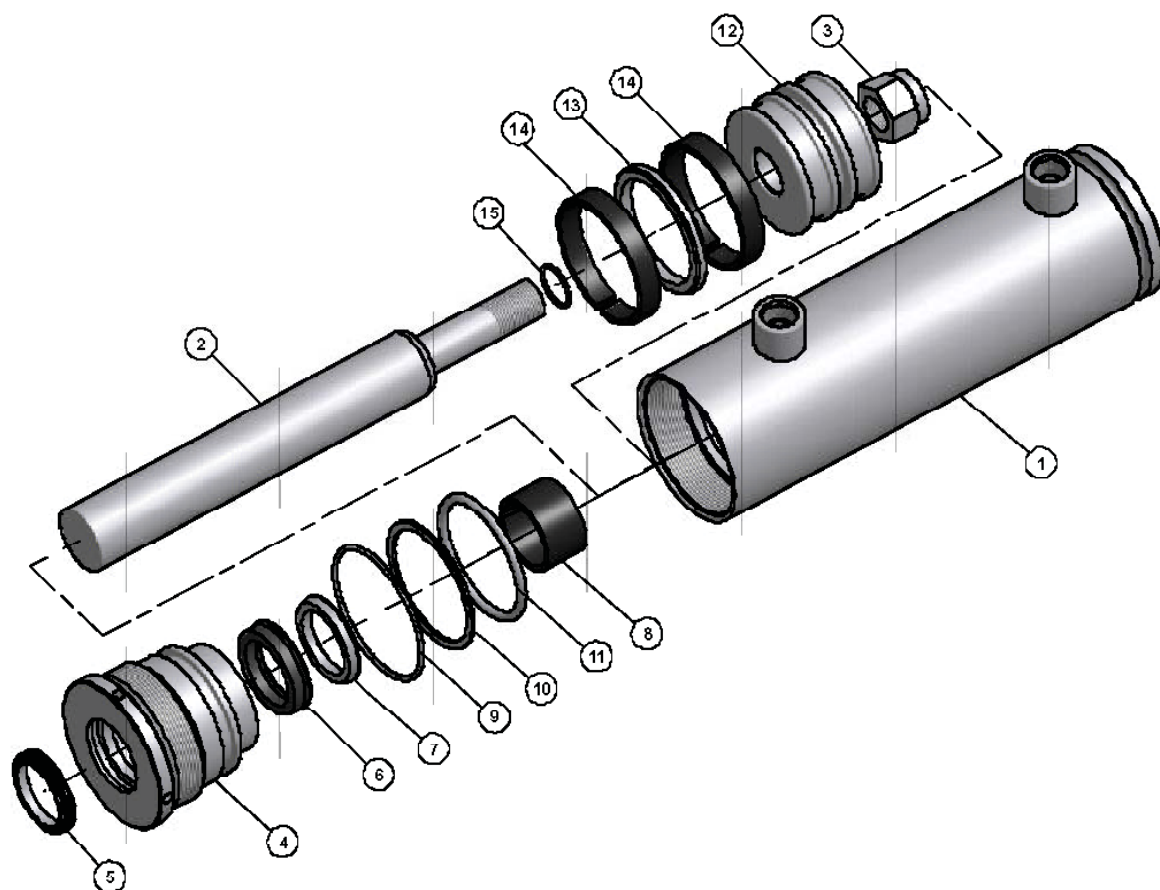
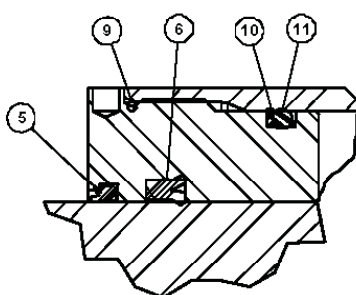


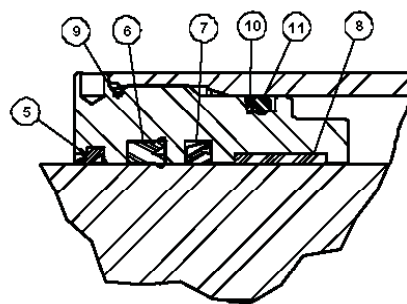
Figure 1. Standard cylinder assembly of seal(s), wiper, backup and o-ring.

Key to Part Numbers:

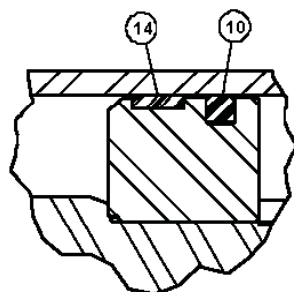
1. Cylinder Main (case)
2. Cylinder Rod
3. Elastic Stop Nut
4. Stuffing Box (head)
5. Wiper
6. Rod Seal
7. Buffer Seal
8. Wear Ring
9. O-ring
10. Back-up Ring
11. O-ring
12. Piston
13. Piston Seal
14. Wear Ring(s)
15. O-ring
16. Self-tapping screw



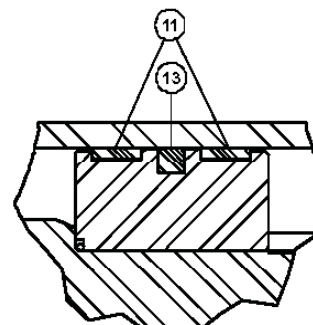
MEDIUM DUTY STUFFING BOX



HEAVY DUTY STUFFING BOX



MEDIUM DUTY PISTON



HEAVY DUTY PISTON

WMD and WHD Series Disassembly instructions

Before getting started:

- Ensure the work environment is clean and safe.
- Remove port plugs (if any) and drain excess oil.

A) Cylinder disassembly

1. Remove self-tapping screw where head meets the case or set screw on side of case.
2. Open the cylinder by using a spanner wrench to turn the head counter clock-wise. The head may be tight due to the manufacture's torque requirement.
3. After head is turned $\frac{3}{4}$ of the way out, support the rod the rest of the way to prevent rod hitting the thread.
4. Be sure not to scratch the rod when removing from case and set it on a clean surface. Note that the surface finish of the rod is crucial to the cylinder's overall quality.

B) Rod disassembly

1. Uninstall elastic stop nut (#3) by using a torque socket wrench turning counter clock-wise. The nut may be difficult due to the manufacture's required torque specification (250 lb/ft ~ 500 lb/ft). Since the surface finish of the rod is crucial to the cylinder's overall quality, use a vise to hold the mount only and support the rest of the rod with a clothed support.
2. Uninstall piston by pulling piston out aligning with the rod so that the piston will not to damage the threads.
3. Uninstall head (#4) by sliding over the threaded rod end. Maintain alignment between rod and head to prevent damage to the thread.

C) Piston disassembly. Please refer to fig.1 for seals, back-up, and o-ring number. These processes may require a seal pick and/or 90 degree seal pick, be cautious not to score the piston wall.

1. Uninstall wear ring(s) (#14) by inserting the tip of the screw driver underneath the wear ring and pry it out. Use the split embedded on one of wear ring to reduce the OD by overlapping the ends. Use caution when uninstalling, although wear ring is made to be flexible, it is also brittle.
2. Repeat same step for second wear ring
3. Uninstall piston seal and energizer ring (#13), using a seal pick to pry it out, and in a circular motion to expand the circumference of the seal. The increased circumference will enable the seal to slide out more efficiently.
4. Uninstall o-ring (#15) is located inside the piston furthest away from the elastic stop nut end. Uninstall it by prying it out with a seal pick.

D) Head disassembly Please refer to fig.1 for respective seals, back-up, and o-ring number. These processes require a seal pick but caution should be used not to score the ID of the head.

1. Uninstall back-up & o-ring (outside head) by inserting the tip of the seal pick underneath the seal, prying it out, and in a circular motion to expand the circumference of the seal. The increased circumference will enable the seal to slide out more efficiently.
 - a. Uninstall o-ring (#11) first before back-up (#10).
 - b. Uninstall back-up (#10)
 - c. Uninstall o-ring (#9)
2. Uninstall head seal(s) (inside head) using the same method as (outside head).
 - a. Uninstall wear ring #8. The split in the wear ring will allow it to come compress and taken out more effectively. Use caution when uninstalling, although wear ring is made to be flexible, it is also brittle.
 - b. Uninstall seal #7
 - c. Uninstall seal #6
 - d. Uninstall seal #5

TOOL LIST:

- Spanner wrench
- Seal pick
- Flat head screw driver
- Seal lubricant (Petroleum Jelly)
- Anti-seize
- Loctite 242

WMD and WHD Series Assembly Instructions

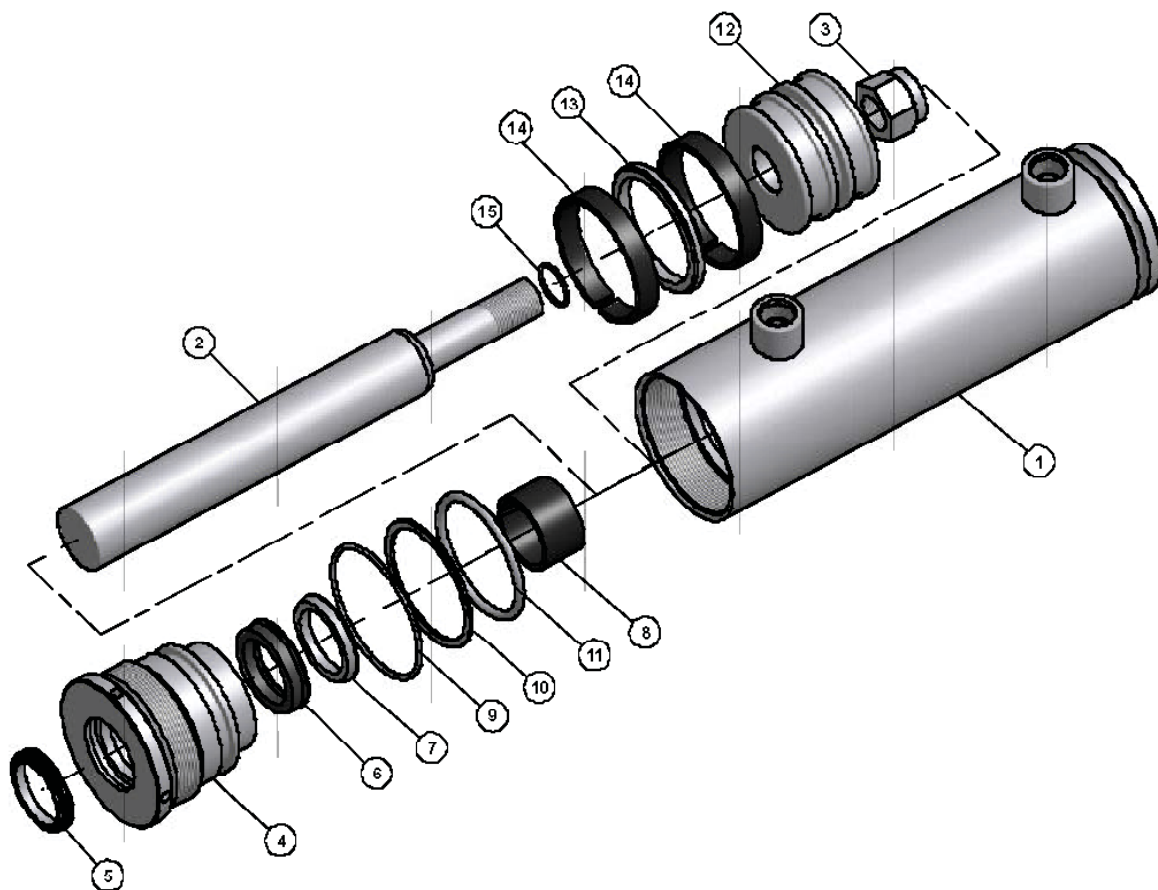
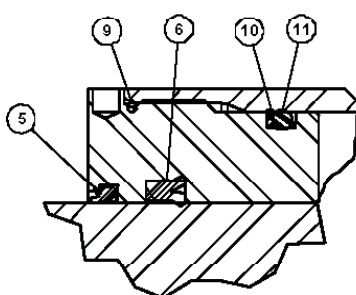


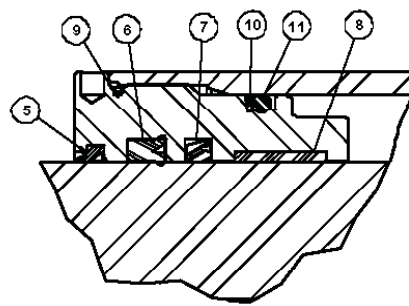
Figure 1. Standard cylinder assembly of seal(s), wiper, backup and o-ring.

Key to Part Numbers:

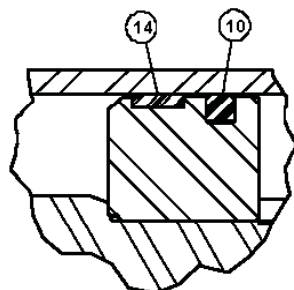
1. Cylinder Main (case)
2. Cylinder Rod
3. Elastic Stop Nut
4. Stuffing Box (head)
5. Wiper
6. Rod Seal
7. Buffer Seal
8. Wear Ring
9. O-ring
10. Back-up Ring
11. O-ring
12. Piston
13. Piston Seal
14. Wear Ring(s)
15. O-ring
16. Self-tapping screw



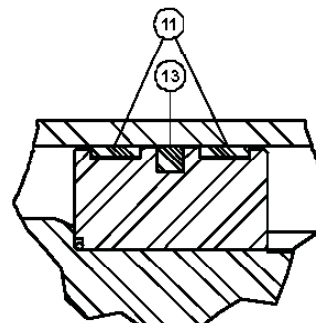
MEDIUM DUTY STUFFING BOX



HEAVY DUTY STUFFING BOX



MEDIUM DUTY PISTON



HEAVY DUTY PISTON

WMD and WHD Series Assembly instructions

Before getting started:

- Ensure the work environment is clean and safe.

A) Clean

Clean head, piston, rod and case with water and small amount of soap. The parts must be dried quickly after washing to prevent possible corrosion.

B) Head Assembly Please refer to fig. 1 for respective seals, back-up, and o-ring installation order.

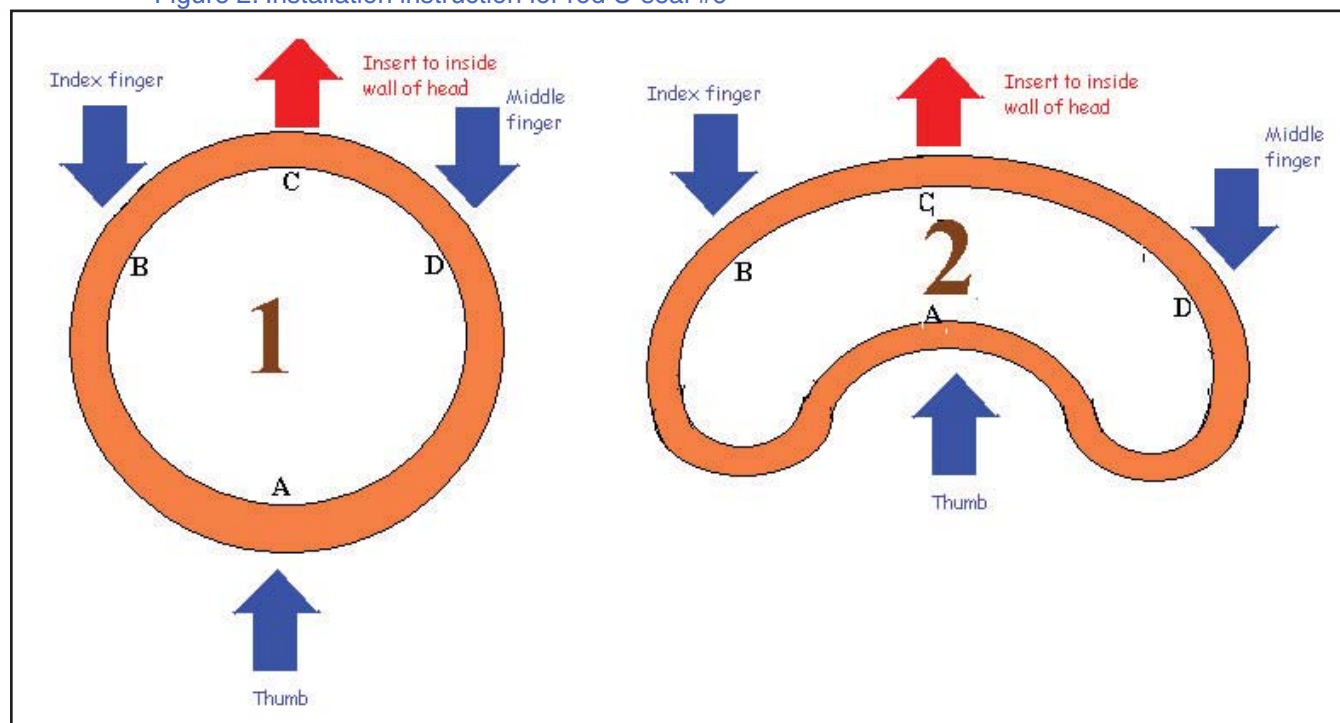
1) Install head seal(s) (inside head).

- a) Install wiper #5. This seal should be fairly easy to install. Note that the wider end should align towards the bottom of the head.
- b) Install seal #6. See fig. 2 for seal #6 instructions.

1. Insert C to the inside wall of the head to use as leverage. Note, the grooved side of the seal should be oriented as the bottom and the flat as top. Figure 1, seal #6 illustrates the proper orientation. Note that the smaller the seal, the more difficult to bend.

2. Now that C is inside the wall of the head, push in at A. Bending motion might require both hands if necessary. Bend B and D inward towards the thumb arrow. The seal might have to be slightly bending up towards the installer to maintain a smaller seal radius to fit inside wall of the head. Slowly slide B and D into the seal groove and release the seal to its original shape. Use a seal pick for leverage if necessary. Care should be taken to not damage the ID or OD sealing lips.

Figure 2. Installation instruction for rod U-seal #6



- c) Install buffer seal#7. This seal is more elastic then rod U-seal#6, therefore the circumference is easier to reduce to install inside the head. After installing the seal, use finger to ensure the seal is properly place.
- d) Install wear ring #8 (inside head). Use caution when installing, although wear ring is made to be flexible, wear ring is also brittle.

1. Compress the wear ring into a smaller circumference.
2. Insert wear ring into inside wall of head.

WMD and WHD Series Assembly instructions

2) Install back-up & o-ring (outside head).

- a) Install o-ring (#9). This o-ring is designed to simply roll in place.
- b) Install back-up ring (#10). The back-up ring helps keep the o-ring (#11) in place. The flat side must be adjacent to the wall and the concaved side must face the o-ring (#11).
- c) Install o-ring (#11) adjacent to back-up (#10). The o-ring should fit into concaved side of the back-up.

C) Piston Assembly Please refer to fig. 1 for respective seals, back-up, and o-ring installation order.

1) Install o-ring (#15).

- a) O-ring (#15) is to be placed inside of the piston furthest away from the elastic stop nut.
- b) Press the o-ring against the inside wall to ensure the seal will not fall out

2) Install piston seals (#13). This is a two piece seal with a Buna energizer and Bronze filled PTFE outer seal.

- a) Seal may not provide sufficient elasticity to slide in place. Aid of a tool such as pick may necessary for installation but please avoid sharp object.
- b) After installing, ensure seal is properly place inside of seal groove.
- c) Energizer (bronze) will need to be stretched to fit over piston and into proper groove.
- d) Place tough Styrofoam sheet around the energizer to prevent any possible damages when using a chain wrench to compress the energizer.

3) Install wear ring(s) (#14). Use caution when installing, although wear ring is made to be flexible, wear ring is also brittle.

- a) Open the circumference of the wear ring providing just enough clearance to slide over the piston. Position in the wear ring groove.
- b) Repeat same step for second wear ring

D) Rod Assembly Instruction for rod only. Please refer to fig. 1 for respective head and piston orientation on rod.

1) Install stuffing box (head) (add lubricant before installation)

- a) Add lubrication (strongly recommend petroleum jelly) to the ID (inside) wiper.
- b) Slide the head onto the threaded end of the rod since other end will have a mount which prevents the head from sliding in.
- c) Use caution not to damage the threads on piston stud.
- d) Gently rock head up-and-down if necessary when sliding head towards mount. Note that the sliding motion should require a firm push; otherwise the seals are installed improperly.

2) Install piston (add lubrication before installation)

- a) Add lubrication (strongly recommend petroleum jelly) to the inside wall.
- b) Place the piston next to the threaded end of the rod. Check to make sure the piston is aligned with the rod. Slowly push the piston so the threads and piston is align, preventing damage to the threads.
- c) Slowly slide the piston up until it meets the major rod diameter. O-ring (#15) should be flush against the leading edge.

3) Install elastic stop nut

- a) After the piston is installed, an elastic stop nut is placed behind piston to prevent it from coming out.
- b) Turn the nut clock-wise until tight.
- c) Torque the nut to the require specification (250 lb/ft ~ 500 lb/ft). Refer to table 1. for torque specification.

WMD and WHD Series Assembly instructions

Table 1. Piston Nut torque specification

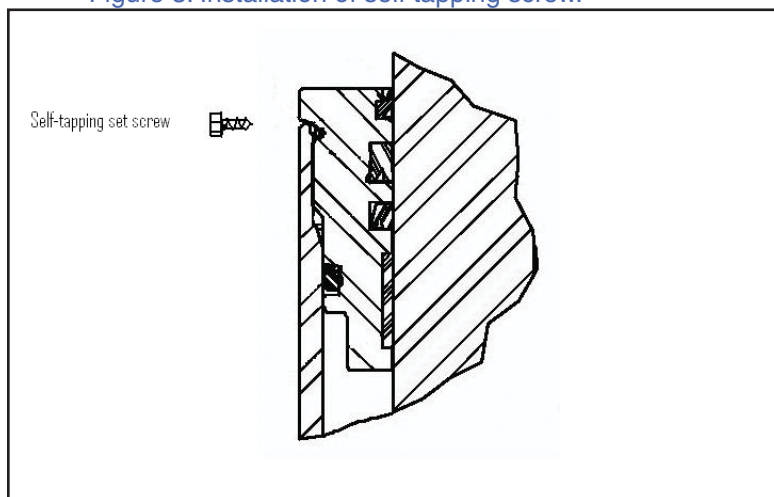
Stud Diameter (inches)	Torque (ft-lbs)
0.75	242
0.875	275
1.00	325
1.12	375
1.25	400
1.50	425
1.75	450
2.00	500

- 4) Lubricate (strongly recommend petroleum jelly) seals and o-rings to aid assembly.

E) Cylinder Assembly

- 1) Install rod assembly
 - a. Lubricate (strongly recommend petroleum jelly) counter bore, incase below thread. Lightly grease piston and head seals, O-ring, back-up, and wear rings. Apply never seize on head.
 - b. Gently insert rod in, piston end first. Push rod all the way in until the head meets the open end of the case. Leave enough distance between the head and mount to provide room for turning the head.
 - c. Slowly turn the head clock-wise manually by hand to ensure the head and case thread is aligned. If the head is difficult to turn after the first few turns, stop and retrieve the head back out. Check the threads for possible foreign objects, wipe the head, realign and screw it back in.
 - d. After head is turned $\frac{3}{4}$ of the way into the case by hand, it may be difficult to proceed. For this purpose, a spanner wrench is required.
 - e. Torque head until firmly seated in case (torque requirement).
- 2) Drill a small diameter hole (size 28) $\frac{9}{32}$ " inches deep where head gland meets the case and install self tapping screw. IF there is a set screw hole, omit self tapping screw and add thread locker (Loctite #242) to set screw and install. Please refer to figure for illustration.

Figure 3. Installation of self tapping screw.

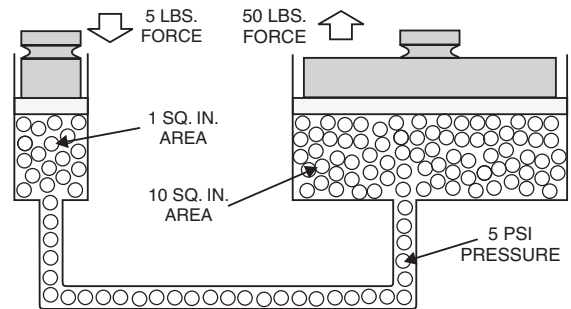


TOOL LIST:

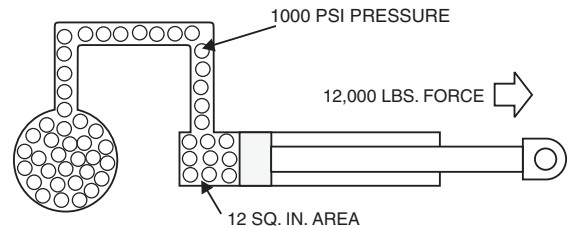
- Spanner wrench
- Seal pick
- Flat head screw driver
- Seal lubricant (Petroleum Jelly)
- Anti-seize
- Loctite 242

Designing With Cylinders

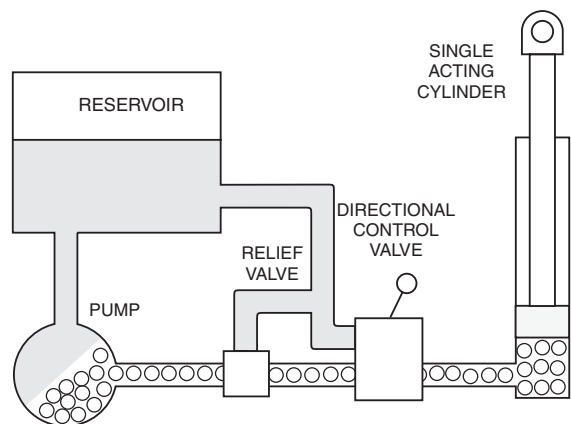
The basis for all hydraulic systems is expressed by Pascal's law which states that the pressure exerted anywhere upon an enclosed liquid is transmitted undiminished, in all directions, to the interior of the container. This principle allows large forces to be generated with relatively little effort. As illustrated, a 5 pound force exerted against a 1 inch square area creates an internal pressure of 5 psi. This pressure, acting against the 10 square inch area develops 50 pounds of force.



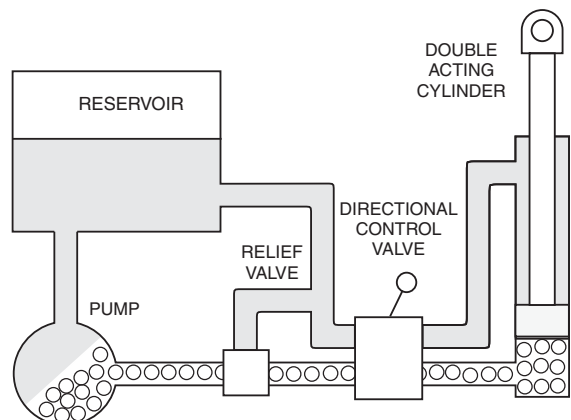
In a basic hydraulic circuit, the force exerted by a cylinder is dependent upon the cylinder bore size and the pump pressure. (There is no force generated unless there is resistance to the movement of the piston). With 1000 psi pump pressure exerted against a 12 square inch piston area (approximately 4" dia.), a force of 12,000 pounds is developed by the cylinder. The speed at which the piston will move is dependent upon the flow rate (gpm) from the pump and the cylinder area. Hence, if pump delivery is 1 gallon per minute (231 cu. in./min.) the cylinder piston will move at a rate of 19.25 in./min. ($231 \text{ cu. in.} \div 12 \text{ sq. in./min.}$).



The simplest hydraulic circuit consists of a reservoir, pump, relief valve, 3-way directional control valve, single acting cylinder, connectors and lines. This system is used where the cylinder piston is returned by mechanical force. With the control valve in neutral, pump flow passes through the valve and back to the reservoir. With the valve shifted, oil is directed to the piston side of the cylinder, causing the piston to move, extending the rod. If the valve is returned to neutral, the oil is trapped in the cylinder, holding it in a fixed position, while pump flow is returned to the reservoir. Shifting the valve in the opposite direction permits the oil to pass through the valve back to the reservoir. The relief valve limits the system pressure to a pre-set amount. Relief valves are commonly incorporated into the directional control valve.



A hydraulic system using a double acting cylinder and a 4-way valve differs from a single acting cylinder system in that the cylinder can exert force in both directions. With the control valve in neutral, flow is returned to the reservoir. When shifted in one direction, oil is directed to the piston side of the cylinder, causing the cylinder to extend. Oil from the rod side passes through the valve back to the reservoir. If the valve is shifted to neutral, oil in the cylinder is trapped, holding it in a fixed position. When the valve is shifted in the opposite position, oil is directed to the rod side of the cylinder, causing the cylinder to retract. Oil from the piston side passes through the valve back to the reservoir. Cylinder extend force is the result of pressure (psi) times the piston area (minus any force resulting from the pressure acting against the rod side of the piston). Retract force is a result of the pressure (psi) times the area difference between the rod and the piston (minus any force resulting from pressure acting against the piston side of the cylinder).

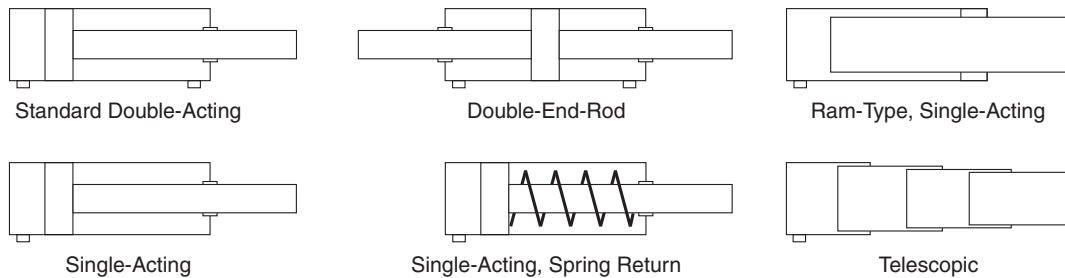


All of the systems described above are open center systems due to the oil flowing through the control valve back to the tank. Most systems are this type. Closed center systems use control valves with the inlet port blocked and variable displacement pumps. With the control valve in neutral, the pump is "de-stroked" to zero flow.

Designing With Cylinders

The function of a cylinder in a fluid power system is to convert energy in the fluid stream into an equivalent amount of mechanical energy. Its power is delivered in a straight-line, push-pull motion.

Graphic Symbols: Following diagram illustrates standard ANSI (American National Standards Institute) graphic symbols for use in circuit diagrams. Six of the more often used are shown:

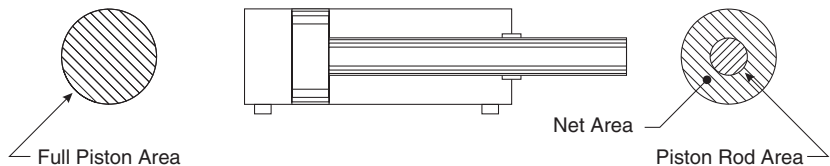


Standard ANSI (American National Standards Institute) Graphic Symbols for Use in Circuit Diagrams.

The standard double-acting cylinder with piston rod out one end, is used in the majority of applications. It develops force in both directions of piston travel. The double-end-rod type is a variation of the standard cylinder but having a piston rod extending out both end caps. It is occasionally used where it is necessary to have equal area on both sides of the piston, such as a steering application, or where one of rod extensions is to be used for mounting a cam for actuation of a limit switch, or for mounting a stroke limiting stop. The single-acting cylinder develops force in one direction, and is retracted by the reactive force from the load or an internal or external spring. The single-acting ram is a construction often used on fork lift mast raise, or a refuse body tailgate raise, or a high tonnage press cylinders. The telescoping cylinder is built in both single-acting and double-acting types. Its purpose is to provide a long stroke with a relatively short collapsed length. The single-acting telescopic is a construction often used to raise dump trucks and dump trailers. The double-acting telescopic is a construction often used in garbage bodies to pack and eject the load.

Force Produced by a Cylinder:

A standard double-acting cylinder has three significant internal areas. The full piston area when exposed to fluid pressure, produces force to extend the piston rod. The amount of this force, in pounds, is calculated by multiplying piston square inch area times gauge pressure, in PSI.



Significant Areas in a Double-Acting Cylinder, Single-End-Rod Type.

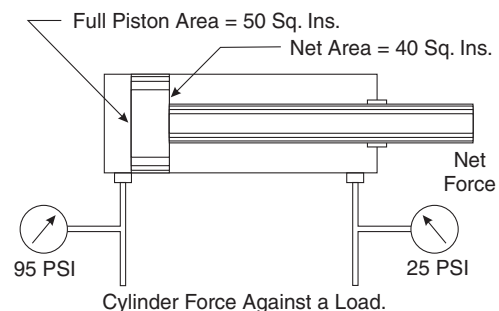
The "net" area on the front side of the piston is less than full piston area because part of the piston surface is covered by the rod. Net area is calculated by subtracting rod area from full piston area. Because net area is always less than piston area, cylinder force for rod retraction is always less than can be developed for extension when working at the same pressure.

Cylinder Force Against a Load: The force which a cylinder can exert against a load is determined by making two calculations. First, extension force is calculated according to piston area and PSI pressure against it. Then, the opposing force on the opposite side of the piston is calculated the same way. Net force against a load is the difference between the two.

Caution! It is incorrect, on a single-end-rod cylinder to calculate cylinder net force as piston area times ΔP (pressure drop, psid) across the piston. This is true only for double-end-rod cylinders which have equal areas on both sides of the piston.

Example: The extension force is 95 PSI x 50 sq. in. = 4750 lbs. The opposing force on the rod side is 25 PSI x 40 sq. in. = 1000 lbs. Therefore, the net force which the cylinder can exert against a load in its extension direction is 4750 - 1000 = 3750 lbs. In making cylinder force calculation we sometimes assume that the opposite side of the piston is at atmospheric pressure, and that the counter-force is zero. On some kinds of loads this can lead to serious error.

Note: Most designers try to eliminate back pressure to get full extend force, but there will always be back pressure.

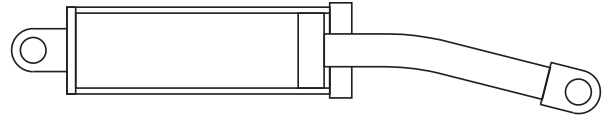


Designing With Cylinders

Standard catalog cylinder models are not designed to take any appreciable side load on the piston rod. They must be mounted so the rod is not placed in a bind at any part of the stroke. If the direction of the load changes during the stroke, hinge mounting must be used on both the rod end and rear end. Use guides on the mechanism, if necessary, to assure that no side load is transmitted to the cylinder rod or piston.

Rod Buckling

Column failure or buckling of the rod may occur if the cylinder stroke is too long relative to the rod diameter. The exact ratio of rod length to rod diameter at which column failure will occur cannot be accurately calculated, but the "Column Strength" table in this manual shows suggested safe ratios for normal applications.

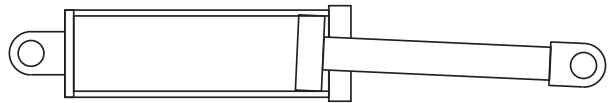


Tension and Compression Failures

All standard cylinders have been designed with sufficiently large piston rods so failure will never occur either in tension or compression, provided the cylinder is operated within the manufacturers pressure rating.

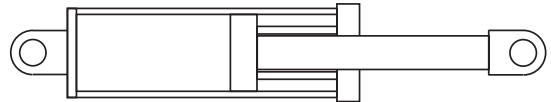
Rod Bearing Failure

Rod bearing failures usually occur when the cylinder is at maximum extension. Failures occur more often on hinge or trunnion mount cylinders, in which the rear support point is located considerably behind the rod bearing. If space permits, it is wise to order cylinders with longer stroke than actually required, and not permit the piston to approach to the front end while under full load.



Stop Collar

On those application where it is necessary to let the piston "bottom out" on the front end, the cylinder may be ordered with a stop collar. The stop collar should be especially considered on long strokes if the distance between support exceeds 10 times the rod diameter, if the maximum thrust is required at full extension, and if the cylinder has a rear flange, clevis, tang, or trunnion mounting.



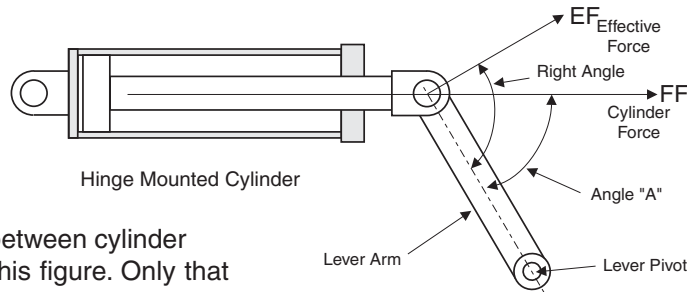
MINIMUM PISTON ROD DIAMETER

Figures in body of chart are suggested minimum rod diameters, in inches.

Load, Pounds	Exposed Length of Piston Rod, Inches / Rod Diameter, Inches							
	10"	20"	40"	60"	70"	80"	100"	120"
1,000			3/4	1				
1,500			13/16	1-1/16				
2,000		5/8	7/8	1-1/8	1-1/4	1-3/8		
3,000		11/16	15/16	1-3/16	1-3/8	1-1/2		
4,000		3/4	1	1-1/4	1-7/16	1-9/16	1-7/8	
6,000	13/16	7/8	1-1/8	1-3/8	1-9/16	1-5/8	1-7/8	
8,000	15/16	1	1-3/16	1-1/2	1-5/8	1-3/4	2	2-1/4
10,000	1	1-1/8	1-5/16	1-9/16	1-3/4	1-7/8	2-1/8	2-3/8
15,000	1-3/16	1-1/4	1-7/16	1-3/4	1-3/4	2	2-1/4	2-1/2
20,000	1-3/8	1-7/16	1-5/8	1-7/8	2	2-1/8	2-7/16	2-3/4
30,000	1-11/16	1-3/4	1-7/8	2-1/8	2-1/4	2-3/8	2-11/16	3
40,000	2	2	2-1/8	2-3/8	2-1/2	2-5/8	2-7/8	3-1/4
60,000	2-3/8	2-7/16	2-1/2	2-3/4	2-3/4	2-7/8	3-1/4	3-1/2
80,000	2-3/4	2-3/4	2-7/8	3	3	3-1/4	3-1/2	3-3/4
100,000	3-1/8	3-1/8	3-1/4	3-3/8	3-1/2	3-1/2	3-3/4	4
150,000	3-3/4	3-3/4	3-7/8	4	4	4-1/8	4-3/8	4-1/2
200,000	4-3/8	4-3/8	4-3/8	4-1/2	4-3/4	4-3/4	4-7/8	5
300,000	5-3/8	5-3/8	5-3/8	5-1/2	5-1/2	5-1/2	5-3/4	6

Cylinder Working a Rotating Lever:

A cylinder working a hinged lever can exert its maximum force on the lever only when the lever axis and cylinder axis are at right angles. When Angle "A" is greater or less than a right angle, only part of the cylinder force is effective on the lever. The cylinder force is found by multiplying the full cylinder force times the sine (sin) of the least angle between cylinder and lever axes. Cylinder Force, FF, is horizontal in this figure. Only that portion, EF, which is at right angles to the lever axis is effective for turning the lever. The value of EF varies with the acute angle "A" between the cylinder and lever axis.



Example: Find the effective force exerted by a 3-inch bore cylinder against a lever when the cylinder is operating at 3000 PSI and when its axis is at an angle of 55 degrees with the lever axis.

First, find the full force developed by the cylinder: FF (full force) = 7.07 (piston area) x 3000 PSI = 21,210 lbs. Next, find the effective force at 55°: EF (effective force) = 21,210 x 819 (sin 55°) = 17,371 lbs.

Since maximum cylinder force is delivered in the right angle position, the hinge points for the cylinder and lever should be located, if possible, so the right angle falls close to the lever position which requires the greatest torque (force).

Note: The working angles on a hinged units, such as a dump truck, refuse body packer blade, or a crane, are constantly changing, it may be necessary to construct a rough model on a sheet of paper, to exact scale, with cardboard arms and thumbtack hinge pins. This will show the point at which the greatest cylinder thrust is needed. An exact calculation can then be made for this condition.

POWER FACTOR TABLE
Trigonometric Sines and Cosines

Angle, Degrees	Sine (sin)	Cosine (cos)	Angle, Degrees	Sine (sin)	Cosine (cos)	Angle, Degrees	Sine (sin)	Cosine (cos)
1	0.0175	0.9998	31	0.5150	0.8572	61	0.8746	0.4848
2	0.0349	0.9994	32	0.5299	0.8480	62	0.8829	0.4695
3	0.0523	0.9986	33	0.5446	0.8387	63	0.8910	0.4540
4	0.0698	0.9976	34	0.5592	0.8290	64	0.8988	0.4384
5	0.0872	0.9962	35	0.5736	0.8192	65	0.9063	0.4226
6	0.1045	0.9945	36	0.5878	0.8090	66	0.9135	0.4067
7	0.1219	0.9925	37	0.6018	0.7986	67	0.9205	0.3907
8	0.1392	0.9903	38	0.6157	0.7880	68	0.9272	0.3746
9	0.1564	0.9877	39	0.6293	0.7771	69	0.9336	0.3584
10	0.1736	0.9848	40	0.6428	0.7660	70	0.9397	0.3420
11	0.1908	0.9816	41	0.6561	0.7547	71	0.9455	0.3256
12	0.2079	0.9781	42	0.6691	0.7431	72	0.9511	0.3090
13	0.2250	0.9744	43	0.6820	0.7314	73	0.9563	0.2924
14	0.2419	0.9703	44	0.6947	0.7193	74	0.9613	0.2756
15	0.2588	0.9659	45	0.7071	0.7071	75	0.9659	0.2588
16	0.2756	0.9613	46	0.7193	0.6947	76	0.9703	0.2419
17	0.2924	0.9563	47	0.7314	0.6820	77	0.9744	0.2250
18	0.3090	0.9511	48	0.7431	0.6691	78	0.9781	0.2079
19	0.3256	0.9455	49	0.7547	0.6561	79	0.9816	0.1908
20	0.3420	0.9397	50	0.7660	0.6428	80	0.9848	0.1736
21	0.3584	0.9336	51	0.7771	0.6293	81	0.9877	0.1564
22	0.3746	0.9272	52	0.7880	0.6157	82	0.9903	0.1392
23	0.3907	0.9205	53	0.7986	0.6018	83	0.9925	0.1219
24	0.4067	0.9135	54	0.8090	0.5878	84	0.9945	0.1045
25	0.4226	0.9063	55	0.8192	0.5736	85	0.9962	0.0872
26	0.4384	0.8988	56	0.8290	0.5592	86	0.9976	0.0698
27	0.4540	0.8910	57	0.8387	0.5446	87	0.9986	0.0523
28	0.4695	0.8829	58	0.8480	0.5299	88	0.9994	0.0349
29	0.4848	0.8746	59	0.8572	0.5150	89	0.9998	0.0175
30	0.5000	0.8660	60	0.8660	0.5000	90	1	0

Cylinders on Cranes and Beams:

Example 1: Calculation to find cylinder force required to handle 15,000 lbs. when the beam is in the position shown.

First find the force F2 at right angles to the beam which must be present to support the 15,000 lb. load.

$$F2 = W \times \cos 50^\circ = 15,000 \times .643 = 9,645 \text{ lbs.}$$

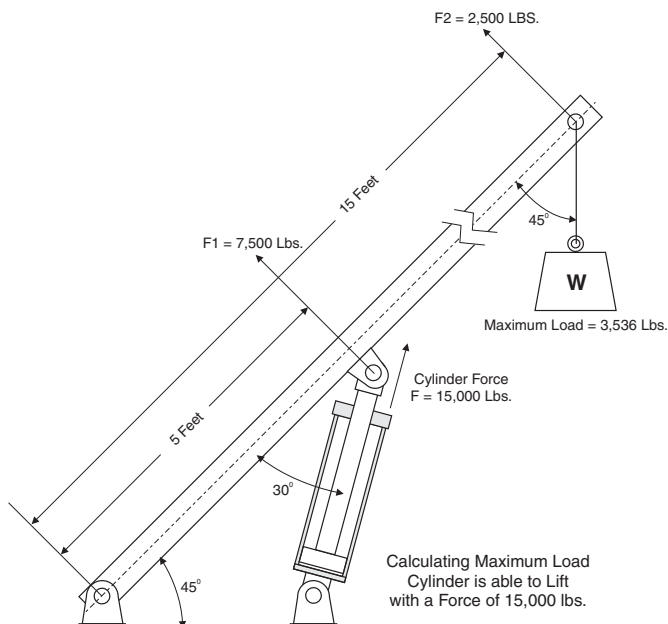
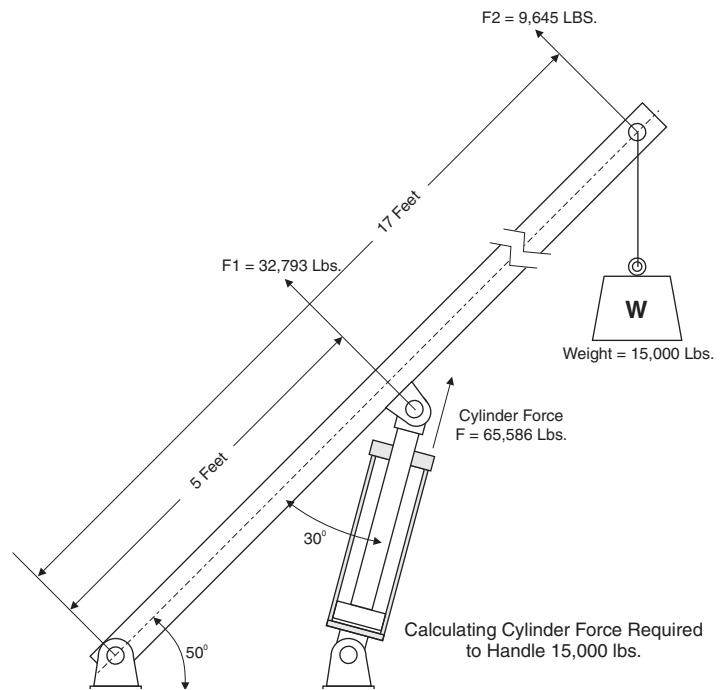
Next, find the force F1, also at right angles to the beam, which must be produced by the cylinder to support the 15,000 lb. load. This is calculated by proportion. F1 will be greater than F2 in the same ratio that arm length 17 feet is greater than arm length 5 feet.

$$\text{Arm length ratio of } 17 \div 5 = 3.4.$$

Therefore, $F1 = 9,645 \times 3.4 = 32,793 \text{ lbs.}$

Finally, calculate the cylinder force, at an angle of 30° to the beam, which will produce a force of 32,793 lbs. at its rod hinge point at right angles to the beam.

$$F (\text{cylinder force}) = F1 \div \sin 30^\circ = 32,793 \div .500 = 65,586 \text{ lbs.}$$



Example 2: Calculation to find maximum load that can be lifted with a cylinder force of 15,000 lbs. when the beam is in the position shown.

First, translate the cylinder thrust, F , of 15,000 lbs. into 7,500 lbs. at right angles to the beam using power factor of 0.500 (sin) from the power factor table, for a 30° angle.

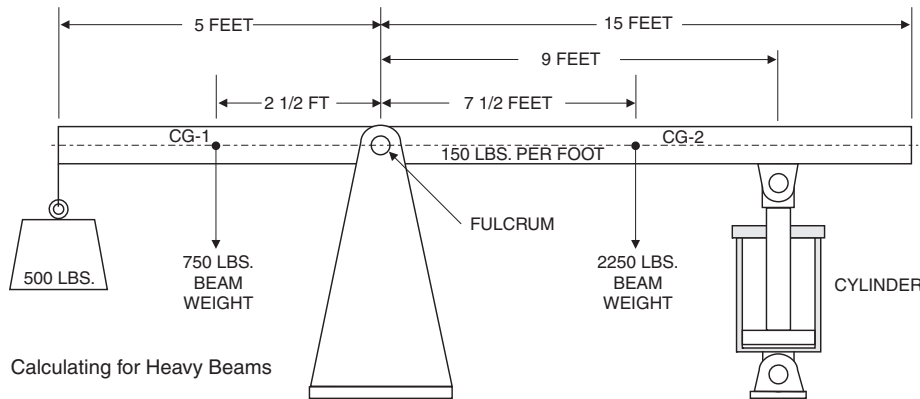
Next, translate this to $F2$, 2,500 lbs. at the end of beam where the weight is suspended. This is done with simple proportion by the length of each arm from the base pivot point. $F2$ is 1/3rd $F1$ since the lever arm is 3 times as long.

Finally, find the maximum hanging load that can be lifted, at a 45° angle between beam and load weight, using sin (power factor) for 45° :

$$W = F2 \div \sin 45^\circ = 2500 \div 0.707 = 3535 \text{ lbs.}$$

Calculations for a Heavy Beam:

On a heavy beam it is necessary to calculate not only for concentrated loads such as the suspended weights and cylinder thrust, but to figure in the weight of the beam itself. If the beam is uniform, so many pounds per foot of length, the calculation is relatively easy. In the example shown in figure "B", the beam has a uniform weight of 150 lbs. per



Calculating for Heavy Beams

foot, is partially counterbalanced by a weight of 500 lbs. on the left side of the fulcrum, and must be raised by the force of a cylinder applied at a point 9 feet from the right side of the fulcrum.

The best method of solution is to use the principle of moments. A moment is a torque force consisting of (so many) pounds applied at a lever distance of (so many) feet or inches. The solution here is to find how much cylinder thrust is needed to just balance the beam. Then, by increasing the hydraulic cylinder

thrust 5 to 10% to take care of friction losses, the cylinder would be able to raise the beam.

Using the principle of moments, it is necessary to calculate all of the moment forces which are trying to turn the beam clockwise, then calculate all the moment forces trying to turn the beam counter-clockwise, then subtract the two. In this case they must be equal to balance the beam.

Clockwise moment due to the 15 feet of beam on the right side of the fulcrum: This can be considered as a concentrated weight acting at its center of gravity 7 1/2 feet from the fulcrum. $\text{Moment} = 150 \text{ (lbs. per foot)} \times 15 \text{ feet} \times 7 \frac{1}{2} \text{ feet} = 16,875 \text{ foot pounds.}$

Counter-clockwise moment due to the 5 feet of beam on the left side of the fulcrum: $150 \text{ (lbs. per foot)} \times 5 \text{ feet} \times 2 \frac{1}{2} \text{ feet (CG distance)} = 1875 \text{ foot pounds.}$

Counter-clockwise moment due to hanging weight of 500 pounds: $500 \times 5 \text{ feet} = 2500 \text{ foot lbs.}$

Subtracting counter-clockwise from clockwise moments: $16,875 - 1875 - 2500 = 12,500 \text{ foot pounds}$ that must be supplied by the cylinder for balance condition. To find cylinder thrust: $12,500 \text{ foot pounds} \div 9 \text{ feet (distance from fulcrum)} = 1388.8 \text{ pounds.}$

Remember when working with moments, that only the portion of the total force which is at right angles to the beam is effective as a moment force. If the beam is at an angle to the cylinder or to the horizontal, then the effective portion of the concentrated or distributed weight, and the cylinder thrust, can be calculated with the power factors (refer to chart).

Theoretical Push and Pull Forces for Hydraulic Cylinders

(values do not reflect losses due to friction or other variables)

$$\text{Force (lb)} = \text{Pressure (psi)} \times \text{Piston Area (sq.in.)}$$

Push Force and Displacement

Cyl. Bore Size (Inches)	Piston Area (Sq. In.)	Cylinder Push Stroke Force In Pounds At Various Pressures										
		250	500	750	1000	1500	2000	2500	3000	3500	4000	5000
2.00	3.14	785	1570	2355	3140	4710	6280	7850	9420	10990	12560	15700
2.50	4.91	1228	2455	3683	4910	7365	9820	12275	14730	17185	19640	24550
3.00	7.07	1768	3535	5303	7070	10605	14140	17675	21210	24745	28280	35350
3.25	8.30	2075	4150	6225	8300	12450	16600	20750	24900	29050	33200	41500
3.50	9.62	2405	4810	7215	9620	14430	19240	24050	28860	33670	38480	48100
4.00	12.57	3143	6285	9428	12570	18855	25140	31425	37710	43995	50280	62850
4.50	15.90	3975	7950	11925	15900	23850	31800	39750	47700	55650	63600	79500
5.00	19.64	4910	9820	14730	19640	29460	39280	49100	58920	68740	78560	98200
5.50	23.76	5940	11880	17820	23760	35640	47520	59400	71280	83160	95040	118800
6.00	28.27	7068	14135	21203	28270	42405	56540	70675	84810	98945	113080	141350
7.00	38.49	9623	19245	28868	38490	57735	76980	96225	115470	134715	153960	192450
8.00	50.27	12568	25135	37703	50270	75405	100540	125675	150810	175945	201080	251350

Deductions for Pull Force and Displacement

Piston Rod Dia. (Inches)	Rod Area (Sq. In.)	Piston Rod Diameter Force In Pounds At Various Pressures To determine Cylinder Pull Force or Displacement, deduct the following Force or Displacement corresponding to Rod Size, from selected Push Stroke Force or Displacement corresponding to Bore Size in table above.										
		250	500	750	1000	1500	2000	2500	3000	3500	4000	5000
1.00	.785	196	393	589	785	1178	1570	1963	2355	2748	3140	3925
1.125	.994	249	497	746	994	1491	1988	2485	2982	3479	3976	4970
1.25	1.23	308	615	923	1230	1845	2460	3075	3690	4305	4920	6150
1.375	1.49	373	745	1118	1490	2235	2980	3725	4470	5215	5960	7450
1.50	1.77	443	885	1328	1770	2655	3540	4425	5310	6195	7080	8850
1.75	2.41	603	1205	1808	2410	3615	4820	6025	7230	8435	9640	12050
2.00	3.14	785	1570	2355	3140	4710	6280	7850	9420	10990	12560	15700
2.25	3.98	995	1990	2985	3980	5970	7960	9950	11940	13930	15920	19900
2.50	4.91	1228	2455	3683	4910	7365	9820	12275	14730	17185	19640	24550
2.75	5.94	1485	2970	4455	5940	8910	11880	14850	17820	20790	23760	29700
3.00	7.07	1768	3535	5303	7070	10605	14140	17675	21210	24745	28280	35350
3.50	9.62	2405	4810	7215	9620	14430	19240	24050	28860	33670	38480	48100
4.00	12.57	3143	6285	9428	12570	18855	25140	31425	37710	43995	50280	62850
4.50	15.90	3975	7950	11925	15900	23850	31800	39750	47700	55650	63600	79500

THEORETICAL CYLINDER SPEEDS (inches per second)

$$\text{Speed (in/sec)} = 3.85 \times \text{Flow (GPM)} \div \text{Area (sq.in.)}$$

Bore	Rod	Flow																
Size	Size	(GPM)	1	2	5	7	10	12	15	20	25	30	35	40	45	50	60	70
2.00		1.2	2.5	6.1	8.6	12.3	14.7	18.4										
	1.00	1.6	3.3	8.2	11.4	16.4	19.6	24.5										
	1.125	1.8	3.6	9.0	12.6	17.9	21.5	26.9										
	1.25	2.0	4.0	10.1	14.1	20.2	24.2	30.2										
	1.375	2.3	4.7	11.6	16.3	23.3	27.9	34.9										
2.50	1.50	2.8	5.6	14.1	19.7	28.1	33.7	42.2										
		0.8	1.6	3.9	5.5	7.9	9.4	11.8	15.7	19.6								
	1.00	0.9	1.9	4.7	6.5	9.3	11.2	14.0	18.7	23.5								
	1.125	1.0	2.0	4.9	6.9	9.8	11.8	14.7	19.7	24.6								
	1.25	1.0	2.1	5.2	7.3	10.5	12.6	15.7	20.9	26.2								
	1.375	1.1	2.3	5.6	7.9	11.3	13.5	16.9	22.5	28.1								
	1.50	1.2	2.5	6.1	8.6	12.3	14.7	18.4	24.5	30.7								
3.00	1.75	1.5	3.1	7.7	10.8	15.4	18.5	23.1	30.8	38.5								
	2.00	2.2	4.4	10.9	15.2	21.8	26.1	32.6	43.5	54.4								
		0.5	1.1	2.7	3.8	5.5	6.5	8.2	10.9	13.6	16.4	19.1						
	1.00	0.6	1.2	3.1	4.3	6.1	7.4	9.2	12.3	15.3	18.4	21.4						
	1.125	0.6	1.3	3.2	4.4	6.3	7.6	9.5	12.7	15.8	19.0	22.2						
	1.25	0.7	1.3	3.3	4.6	6.6	7.9	9.9	13.2	16.5	19.8	23.1						
	1.375	0.7	1.4	3.5	4.8	6.9	8.3	10.4	13.8	17.3	20.7	24.2						
	1.50	0.7	1.5	3.6	5.1	7.3	8.7	10.9	14.5	18.2	21.8	25.4						
3.25	1.75	0.8	1.7	4.1	5.8	8.3	9.9	12.4	16.5	20.7	24.8	28.9						
	2.00	1.0	2.0	5.0	6.9	9.8	11.8	14.7	19.6	24.5	29.4	34.3						
		0.5	0.9	2.3	3.3	4.6	5.6	7.0	9.3	11.6	13.9	16.3	18.6					
	1.25	0.5	1.1	2.7	3.8	5.4	6.5	8.2	10.9	13.6	16.3	19.1	21.8					
3.50	1.375	0.6	1.1	2.8	3.9	5.7	6.8	8.5	11.3	14.1	17.0	19.8	22.6					
	1.50	0.6	1.2	2.9	4.1	5.9	7.1	8.8	11.8	14.7	17.7	20.6	23.6					
	1.75	0.7	1.3	3.3	4.6	6.5	7.9	9.8	13.1	16.4	19.6	22.9	26.2					
	2.00	0.8	1.5	3.7	5.2	7.5	9.0	11.2	15.0	18.7	22.4	26.1	29.9					
		0.4	0.8	2.0	2.8	4.0	4.8	6.0	8.0	10.0	12.0	14.0	16.0	18.0				
4.00	1.25	0.5	0.9	2.3	3.2	4.6	5.5	6.9	9.2	11.5	13.8	16.1	18.4	20.6				
	1.375	0.5	0.9	2.4	3.3	4.7	5.7	7.1	9.5	11.8	14.2	16.6	18.9	21.3				
	1.50	0.5	1.0	2.5	3.4	4.9	5.9	7.4	9.8	12.3	14.7	17.2	19.6	22.1				
	1.75	0.5	1.1	2.7	3.7	5.3	6.4	8.0	10.7	13.4	16.0	18.7	21.4	24.0				
	2.00	0.6	1.2	3.0	4.2	5.9	7.1	8.9	11.9	14.7	17.8	20.8	23.8	26.8				
		0.8	1.6	4.1	5.7	8.2	9.8	12.3	16.4	20.4	24.5	28.6	32.7	36.8				
			0.6	1.5	2.2	3.1	3.7	4.6	6.1	7.7	9.2	10.7	12.3	13.8	15.3	18.4		
4.50	1.375		0.7	1.7	2.4	3.5	4.2	5.2	6.9	8.7	10.4	12.2	13.9	15.6	17.4	20.8		
	1.50		0.7	1.8	2.5	3.6	4.3	5.3	7.1	8.9	10.7	12.5	14.3	16.0	17.8	21.4		
	1.75		0.8	1.9	2.7	3.8	4.6	5.7	7.6	9.5	11.4	13.3	15.2	17.1	19.0	22.8		
	2.00		0.8	2.0	2.9	4.1	4.9	6.1	8.2	10.2	12.3	14.3	16.4	18.4	20.4	24.5		
	2.50		1.0	2.5	3.5	5.0	6.0	7.5	10.1	12.6	15.1	17.6	20.1	22.6	25.1	30.2		
	3.00		1.4	3.5	4.9	7.0	8.4	10.5	14.0	17.5	21.0	24.5	28.0	31.5	35.0	42.0		
			0.5	1.2	1.7	2.4	2.9	3.6	4.8	6.1	7.3	8.5	9.7	10.9	12.1	14.5	17.0	
	1.75		0.6	1.4	2.0	2.9	3.4	4.3	5.7	7.1	8.6	10.0	11.4	12.8	14.3	17.1	20.0	
	2.00		0.6	1.5	2.1	3.0	3.6	4.5	6.0	7.6	9.1	10.6	12.1	13.6	15.1	18.1	21.1	
	2.50		0.7	1.8	2.5	3.5	4.2	5.3	7.0	8.8	10.5	12.3	14.0	15.8	17.5	21.0	24.5	
5.00	3.00		0.9	2.2	3.1	4.4	5.2	6.5	8.7	10.9	13.1	15.3	17.4	19.6	21.8	26.2	30.5	
	3.50		1.2	3.1	4.3	6.1	7.4	9.2	12.3	15.3	18.4	21.5	24.5	27.6	30.7	36.8	42.9	
			0.4	1.0	1.4	2.0	2.4	2.9	3.9	4.9	5.9	6.9	7.9	8.8	9.8	11.8	13.7	
	2.00		0.5	1.2	1.6	2.3	2.8	3.5	4.7	5.8	7.0	8.2	9.3	10.5	11.7	14.0	16.4	
	2.50		0.5	1.3	1.8	2.6	3.1	3.9	5.2	6.5	7.8	9.1	10.5	11.8	13.1	15.7	18.3	
	3.00		0.6	1.5	2.2	3.1	3.7	4.6	6.1	7.7	9.2	10.7	12.3	13.8	15.3	18.4	21.5	
	3.50		0.8	1.9	2.7	3.9	4.6	5.8	7.7	9.6	11.5	13.5	15.4	17.3	19.2	23.0	26.9	
5.50	4.00		1.1	2.7	3.8	5.4	6.5	8.2	10.9	13.6	16.3	19.1	21.8	24.5	27.2	32.7	38.1	
				0.8	1.1	1.6	1.9	2.4	3.2	4.1	4.9	5.7	6.5	7.3	8.1	9.7	11.3	
	2.50			1.0	1.4	2.0	2.5	3.1	4.1	5.1	6.1	7.1	8.2	9.2	10.2	12.3	14.3	
	3.00			1.2	1.6	2.3	2.8	3.5	4.6	5.8	6.9	8.1	9.2	10.4	11.5	13.8	16.1	
	3.50			1.4	1.9	2.7	3.3	4.1	5.4	6.8	8.2	9.5	10.9	12.3	13.6	16.3	19.1	
	4.00			1.7	2.4	3.4	4.1	5.2	6.9	8.6	10.3	12.0	13.8	15.5	17.2	20.6	24.1	
6.00	4.50			2.4	3.4	4.9	5.9	7.3	9.8	12.2	14.7	17.1	19.6	22.0	24.5	29.4	34.3	
				0.7	1.0	1.4	1.6	2.0	2.7	3.4	4.1	4.8	5.5	6.1	6.8	8.2	9.5	
	2.50			0.8	1.2	1.7	2.0	2.5	3.3	4.1	5.0	5.8	6.6	7.4	8.2	9.9	11.5	
	3.00			0.9	1.3	1.8	2.2	2.7	3.6	4.5	5.5	6.4	7.3	8.2	9.1	10.9	12.7	
	3.50			1.0	1.4	2.1	2.5	3.1	4.1	5.2	6.2	7.2	8.3	9.3	10.3	12.4	14.5	
	4.00			1.2	1.7	2.5	2.9	3.7	4.9	6.1	7.4	8.6	9.8	11.0	12.3	14.7	17.2	
7.00	4.50			1.6	2.2	3.1	3.7	4.7	6.2	7.8	9.3	10.9	12.4	14.0	15.6	18.7	21.8	
				0.5	0.7	1.0	1.2	1.5	2.0	2.5	3.0	3.5	4.0	4.5	5.0	6.0	7.0	
	2.50			0.6	0.8	1.1	1.4	1.7	2.3	2.9	3.4	4.0	4.6	5.2	5.7	6.9	8.0	
	3.00			0.6	0.9	1.2	1.5	1.8	2.5	3.1	3.7	4.3	4.9	5.5	6.1	7.4	8.6	
	3.50			0.7	0.9	1.3	1.6	2.0	2.7	3.3	4.0	4.7	5.3	6.0	6.7	8.0	9.3	
	4.00			0.7	1.0	1.5	1.8	2.2	3.0	3.7	4.5	5.2	5.9	6.7	7.4	8.9	10.4	
8.00	4.50			0.9	1.2	1.7	2.0	2.6	3.4	4.3	5.1	6.0	6.8	7.7	8.5	10.2	11.9	
					0.5	0.8	0.9	1.2	1.5	1.9	2.3	2.7	3.1	3.5	3.8	4.6	5.4	
	3.50				0.7	1.0	1.1	1.4	1.9	2.4	2.8	3.3	3.8	4.3	4.7	5.7	6.6	
	4.00				0.7	1.0	1.2	1.5	2.0	2.6	3.1	3.6	4.1	4.6	5.1	6.1	7.2	
	4.50				0.8	1.1	1.3	1.7	2.2	2.8	3.4	3.9	4.5	5.0	5.6	6.7	7.8	

Hydraulic Oil Recommendations

All cylinder parts, with the exception of a few items, are lubricated by the hydraulic oil in the circuit. Particular attention must be paid to keep the oil in the circuit clean. Whenever there is a hydraulic component failure (cylinder, pump, valve), and there is a reason to feel that metal particles may be in the system, the oil must be drained, the entire system flushed clean, and any filter screens thoroughly cleaned or replaced. New oil should be supplied for the entire system. Oil suitable and recommended for use in circuits involving Commercial cylinders should meet the following specifications:

***These suggestions are intended as a guide only.
Obtain your final oil recommendations from your oil supplier.***

Viscosity Recommendations:

Optimum operating viscosity is considered to be about 100 SSU.

- * 50 SSU minimum @ operating temperature
7500 SSU maximum @ starting temperature
- * 150 to 225 SSU @ 100° F. (37.8° C.) (generally)
44 to 48 SSU @ 210° F. (98.9° C.) (generally)

Other Desirable Properties:

Viscosity Index: 90 minimum

Aniline point: 175 minimum

Additives Usually Recommended:

Rust and Oxidation (R & O) Inhibitors
Foam Depressant

Other Desirable Characteristics:

Stability of physical and chemical characteristics.

High demulsibility (low emulsibility) for separation of water, air and contaminants.

Resistant to the formation of gums, sludges, acids, tars and varnishes.

High lubricity and film strength.

General Recommendations:

A good quality hydraulic oil conforming to the characteristics listed above is essential to the satisfactory performance and long life of any hydraulic system.

Oil should be changed on regular schedules in accordance with the manufactures recommendations and the system periodically flushed.

Oil operating temperature should not exceed 200° F. (93° C.) with a maximum of 180° F. (82° C.) generally recommended. 120° F. to 140° F. (50° C. to 60° C.) is generally considered optimum. High temperatures result in rapid oil deterioration and may point out a need for an oil cooler or a larger reservoir. The nearer to optimum temperature, the longer the service life of the oil and the hydraulic components.

Reservoir size should be large enough to hold and cool all the fluid a system will need, yet it should not be wastefully large. Minimum required capacity can vary anywhere between 1 and 3 times pump output. The reservoir must be able to hold all of the fluid displaced by retracted cylinders when the system is not operating, yet provide space for expansion and foaming.

Oil poured into the reservoir should pass through a 100 mesh screen. Pour only clean oil from clean containers into the reservoir.

Never use Crank Case Drainings, Kerosene, Fuel Oil, or any Non-Lubricating Fluid, such as Water.

Approximate SSU at . . .

Oil Grade	100° F. (37.8° C.)	210° F. (98.9° C.)
SAE 10	150	43
SAE 20	330	51

Normal Temperatures:

0° F. (-18° C.) to 100° F. (37.8° C.) ambient

100° F. (37.8° C.) to 180° F. (82.2° C.) system

Be sure the oil you use is recommended for the temperature you expect to encounter.

Hydraulic Cylinder Formulas

CYLINDER FORMULAS

Thrust or force of any cylinder:

$$F = A \times P$$

$$P = F \div A$$

$$A = F \div P$$

F = Force or thrust, in pounds

A = Piston area in square inches ($.7854 \times D^2$)

P = PSI (Gauge pressure in pounds per square inch)

$$HP = \frac{\text{Pounds of push (or pull) x Distance (in feet)}}{550 \times \text{Time (in seconds)}}$$

HP = Horsepower

Circle Formula:

$$A = D \times D \times .7854$$

$$A = D^2 \times 0.7854$$

$$A = \pi \times R^2$$

$$A = \pi \times D^2 \div 4$$

$$\text{Circumference} = 2 \times R \times \pi$$

$$\text{Circumference} = \pi \times D$$

$$D = \sqrt{A/.7854}$$

A = Area in² (Area sq. in.)

R = Radius (1/2 of Diameter)

D = Diameter, inches

$\pi = 3.14$

Hydraulic Cylinder Piston travel speed:

$$V1 \text{ (in/min)} = CIM \div A$$

$$V2 \text{ (ft/min)} = Q \times 19.25 \div A$$

$$V3 \text{ (ft/sec)} = Q \times 0.3208 \div A$$

$$Q \text{ (GPM)} = 3.117 \times V3 \text{ (ft/sec)} \times A$$

$$Q \text{ (GPM)} = CIM \div 231$$

V1 = Velocity or piston travel speed, inches per minute

V2 = Velocity or piston travel speed, feet per minute

V3 = Velocity or piston travel speed, feet per second

CIM = Flow rate in cubic inches per minute (in³)

A = Effective area in square inches (in²)

Q = GPM Gallons per minute

1 Gallon = 231 in³ (cubic inch)

Volume required to move a piston a given distance:

$$V = A \times L$$

V = Volume in cubic inches (in³)

A = Area in square inches (in²)

L = Length or stroke in inches

Regenerative Cylinder

$$\text{Extend Speed} = \frac{\text{Rod Volume}}{\text{Flow Rate}} \text{ in}^3$$

$$\text{Area to Retract} = \text{Area to extend} - \text{Rod Area}$$

$$\text{Cylinder Ratio} = \frac{\text{Area to extend}}{\text{Area to retract}}$$

Note:

Ratio can be used to calculate pressure intensification and flow intensification.

Effective force of a cylinder working at an angle to direction of the load travel:

$$F = T \times \sin A$$

T = Total cylinder force, in pounds

F = Part of the force which is effective, in pounds

A = Least angle, in degrees, between cylinder axis and load direction.

Moment Arm Equations / Levers:

$$F \times Df = W \times Dw_w$$

$$F = W \times Dw \div Df$$

$$W = F \times Df \div Dw$$

$$Df = W \div F \times Dw$$

$$Dw = F \div W \times Df$$

F = Cylinder force

Df = Cylinder force distance to pivot

W = Weight or Load Force

Dw = Weight or Load Force distance to pivot

Toggle Force:

$$T = F \times A \div 2 \times B$$

T = Toggle Force

F = Cylinder Force

A = Distance cylinder centerline to toggle

B = Remaining stroke

Force for piercing or shearing sheet metal:

$$F = P \times T \times PSI$$

F = Force required, in pounds

P = Perimeter around area to be sheared, in inches

T = Sheet thickness in inches

PSI = Sheer strength rating of the material in pounds per square inch.

P.O. Check Application:

$$\text{Release PSI} = \frac{\text{Cap End Area} \times \text{Max. W.P.} - \text{Load}}{\text{Rod End Area}}$$

Max. W.P. = Pressure Rating of Components

$$\text{Ratio} = \frac{\text{Max Working PSI}}{\text{Release PSI}}$$

Example;

2 to 1 Ratio = 1 square inch (in²) at 1000 psi working pressure will open when a Release pressure of 500 psi is applied to a 2 square inches (in²) area.

Storage and Installation

STORAGE

It pays to keep spare hydraulic cylinders on hand for use when you need them. But, you must know and follow these recommended storage practices or the cylinders can be ruined. Hydraulic cylinders, though often large and unwieldy, are precision machines with finely finished parts and close tolerances. And they're expensive. So handle them with care.

For optimum storage life, hydraulic cylinders should be kept in an environment that is protected from excessive moisture and temperature extremes. A hot, dry desert climate with cold nights, for example, must be accommodated when choosing the storage area. Daytime heat quickly bakes oil out of sealing materials, which causes leaks and rapid wear when the cylinder is placed in service. Cooling at night causes water condensation and corrosion damage to wear surfaces. Storage areas that allow exposure to rain, snow and extreme cold must like wise be avoided.

It's best to store cylinders indoors if possible. But indoors or out, be sure that plugs or closures are properly installed in all ports to keep out moisture and dirt. However, overtightening of port plugs should be avoided. Widely varying temperatures and tightly closed ports may cause pressure inside the cylinder to build up to the point where the piston moves far enough to expose the rod to corrosion or contamination. Try to choose a storage location where the cylinders are protected from physical damage. Even a little ding from a falling bar or forklift tine can cause trouble later.

Cylinders, Particularly large ones, should be stored closed in a vertical position with the rod end down. Be sure they're blocked securely to keep them from toppling. Storing with the rod ends down keeps oil on the seals, which protects them from drying out. This is more critical with fabric and butyl seals than with urethane sealing materials. Storing single-acting cylinders with the rod end up can cause port closures to pop open and leak, exposing the sleeves to corrosion damage and contamination. Storing with the rod end down also discourages the temptation to lift a cylinder by the rod eye – a dangerous practice. If horizontal storage cannot be avoided, the rod or cylinder should be rolled into a new position every two months or so to prevent drying, distortion and deterioration of the seals. Don't forget that a cylinder can be a major source of contamination. A small scratch or nick on the sleeve will quickly shred packing and contaminate the system. Store cylinders carefully and keep them clean.

The following procedures should be followed in order to prevent oxidation and maintain the surfaces of a mounted hydraulic cylinder during idle periods. These idle periods may include; inventory units, demo units, out of service units, etc.

- All machined surfaces left expose should be coated with a light film of grease, if not oxidation will occur.
- If oxidation is present, apply a light coat of oil to the surfaces.
- Buff surfaces with 320 or 400 grit sandpaper. Do not buff surfaces up and down the length, buff only around the circumference.
- If after buffing, the surfaces show evidence of oxidation damage i.e., pitting, the cylinder should be inspected by an authorized service center for evaluation.
- Operation of a hydraulic cylinder with surface damage will shorten the longevity and preclude any warranty express or implied.

INSTALLATION

• Cleanliness is an important consideration, and Parker cylinders are shipped with the ports plugged to protect them from contaminants entering the ports. These plugs should not be removed until the piping is to be installed. Before making the connection to the cylinder ports, the piping should be thoroughly cleaned to remove all chips or burrs which might have resulted from threading or flaring operations. One small foreign particle can cause premature failure of the cylinder or other hydraulic system components. If oxidation is present, apply a light coat of oil to the surfaces.

• Proper alignment of the cylinder piston rod and its mating component on the machine should be checked in both the extended and retracted positions. Improper alignment will result in excessive rod gland and/or cylinder bore wear.

• Cylinders operating in an environment where air drying material are present such as fast- drying chemicals, paint, or welding splatter, or other hazardous conditions such as excessive heat, should have shields installed to prevent damage to the piston rod and piston rod seals.

Parker Safety Guide for Selecting and Using Hydraulic Cylinders and Their Accessories

WARNING:  FAILURE OR IMPROPER SELECTION OR IMPROPER USE OF CYLINDERS AND THEIR RELATED ACCESSORIES CAN CAUSE DEATH, PERSONAL INJURY AND PROPERTY DAMAGE.

Before selecting or using Parker cylinders or related accessories, it is important that you read, understand and follow the following safety information.

User Responsibility

Due to very wide variety of cylinder applications and cylinder operating conditions, Parker does not warrant that any particular cylinder is suitable for any specific application. This safety guide does not analyze all technical parameters that must be considered in selecting a product. The hydraulic and pneumatic cylinders outlined in this catalog are designed to Parker's design guide lines and do not necessarily meet the design guide lines of other agencies such as American Bureau of Shipping, ASME Pressure Vessel Code etc. The user, through its own analysis and testing, is solely responsible for:

- Making the final selection of the cylinders and related accessories.
- Determining if the cylinders are required to meet specific design requirements as required by the Agency(s) or industry standards covering the design of the user's equipment.
- Assuring that the user's requirements are met, OSHA requirements are met, and safety guidelines from the applicable agencies such as but not limited to ANSI are followed and that the use presents no health or safety hazards.
- Providing all appropriate health and safety warnings on the equipment on which the cylinders are used.

Seals

The seals for the product lines shown in this catalogue are intended for mineral base hydraulic fluids and for the operating temperatures ranges as indicated. The operation of these products with other fluids or at other operating temperatures must be brought to the attention of our engineering department so that proper seals for intended operation may be selected.

The application of cylinders may allow fluids such as cutting fluids, wash down fluids etc. to come in contact with the external area of the cylinder. These fluids may attack the piston rod wiper and or the primary seal and must be taken into account when selecting and specifying seal compounds.

Dynamic seals will wear. The rate of wear will depend on many operating factors. Wear can be rapid if a cylinder is mis-aligned or if the cylinder has been improperly serviced. The user must take seal wear into consideration in the application of cylinders.

Piston Rods

Possible consequences of piston rod failure or separation of the piston rod from the piston include, but are not limited to are:

- Piston rod and or attached load thrown off at high speed.
- High velocity fluid discharge.
- Piston rod extending when pressure is applied in the piston retract mode.

Piston rods or machine members attached to the piston rod may move suddenly and without warning as a consequence of other conditions occurring to the machine such as, but not limited to:

- Unexpected detachment of the machine member from the piston rod.
- Failure of the pressurized fluid delivery system (hoses, fittings, valves, pumps, compressors) which maintain cylinder position.
- Catastrophic cylinder seal failure leading to sudden loss of pressurized fluid.
- Failure of the machine control system.

Part of selecting cylinders for a specific operation involves the proper selection of the piston rod diameter. This catalogue contains information in the selection of piston rod diameter, which must be followed in order to avoid possible buckling.

Piston rods are not normally designed to absorb bending moments or loads which are perpendicular to the axis of piston rod motion. These additional loads can cause the piston rod to fail. If these types of additional loads are expected to be imposed on the piston rod, their magnitude should be made known to our engineering department.

The cylinder user should always make sure that the piston rod is securely attached to the machine member.

Cushions

Cushions are devices internal to the cylinder to slow the piston and rod assembly down at the end of the stroke. It is suggested they be used to reduce piston impact at the end of the cylinder stroke when the cylinder is expected to move at relatively high velocity.

Cylinder cushions are normally designed to absorb the energy of a linear applied load. A rotating mass has considerably more energy than the same mass moving in a linear mode. Cushioning for a rotating mass application should be review by our engineering department.

Cylinder Mountings

Some cylinder mounting configurations may have certain limitations such as but not limited to minimum stroke for side or foot mounting cylinders or pressure de-ratings for certain flange mounts. Carefully review the catalog for these types of restrictions.

Always mount cylinders using the largest possible high tensile alloy steel socket head cap screws that can fit in the cylinder mounting holes and torque them to the manufacturer's recommendations for their size.

Port Fittings

Hydraulic cylinders applied with meter out or deceleration circuits are subject to intensified pressure at piston rod end.

The rod end pressure is approximately equal to:

$$\frac{\text{operating pressure} \times \text{effective cap end area}}{\text{effective rod end piston area}}$$

Contact your connector supplier for the pressure rating of individual connectors.

Cylinder Modifications or Repairs

Cylinders as shipped from the factory are not to be disassembled and or modified. If cylinders require modifications, these modifications must be done at Parker locations or by Parker certified facilities. The Mobile Cylinder Division Engineering Department must be notified in the event of a mechanical fracture or permanent deformation of any cylinder component (excluding seals). This includes a broken piston rod, mounting accessory or any other cylinder component. This notification should include all operation and application details. This information will be used to provide an engineered repair that will prevent recurrence of the failure. It is allowed to disassemble cylinders for the purpose of replacing seals or seal assemblies.

Offer of Sale

The items described in this document and other documents and descriptions provided by Parker Hannifin Corporation, its subsidiaries and its authorized distributors ("Seller") are hereby offered for sale at prices to be established by Seller. This offer and its acceptance by any customer ("Buyer") shall be governed by all of the following Terms and Conditions. Buyer's order for any item described in this document, when communicated to Seller verbally, or in writing, shall constitute acceptance of this offer. All goods or work described will be referred to as "Products".

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2. **Price Adjustments; Payments.** Prices stated on the reverse side or preceding pages of this document are valid for 30 days. After 30 days, Seller may change prices to reflect any increase in its costs resulting from state, federal or local legislation, price increases from its suppliers, or any change in the rate, charge, or classification of any carrier. The prices stated on the reverse or preceding pages of this document do not include any sales, use, or other taxes unless so stated specifically. Unless otherwise specified by Seller, all prices are F.O.B. Seller's facility, and payment is due 30 days from the date of invoice. After 30 days, Buyer shall pay interest on any unpaid invoices at the rate of 1.5% per month or the maximum allowable rate under applicable law.
3. **Delivery Dates; Title and Risk; Shipment.** All delivery dates are approximate and Seller shall not be responsible for any damages resulting from any delay. Regardless of the manner of shipment, title to any products and risk of loss or damage shall pass to Buyer upon tender to the carrier at Seller's facility (*i.e.*, when it's on the truck, it's yours). Unless otherwise stated, Seller may exercise its judgment in choosing the carrier and means of delivery. No deferment of shipment at Buyers' request beyond the respective dates indicated will be made except on terms that will indemnify, defend and hold Seller harmless against all loss and additional expense. Buyer shall be responsible for any additional shipping charges incurred by Seller due to Buyer's changes in shipping, product specifications or in accordance with Section 13, herein.
4. **Warranty.** Seller warrants that the Products sold hereunder shall be free from defects in material or workmanship for a period of eighteen months from the date of delivery to Buyer. The prices charged for Seller's products are based upon the exclusive limited warranty stated above, and upon the following disclaimer: **DISCLAIMER OF WARRANTY: THIS WARRANTY COMPRISES THE SOLE AND ENTIRE WARRANTY PERTAINING TO PRODUCTS PROVIDED HEREUNDER. SELLER DISCLAIMS ALL OTHER WARRANTIES, EXPRESS AND IMPLIED, INCLUDING MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.**
5. **Claims; Commencement of Actions.** Buyer shall promptly inspect all Products upon delivery. No claims for shortages will be allowed unless reported to the Seller within 10 days of delivery. No other claims against Seller will be allowed unless asserted in writing within 60 days after delivery or, in the case of an alleged breach of warranty, within 30 days after the date within the warranty period on which the defect is or should have been discovered by Buyer. Any action based upon breach of this agreement or upon any other claim arising out of this sale (other than an action by Seller for any amount due to Seller from Buyer) must be commenced within thirteen months from the date of tender of delivery by Seller or, for a cause of action based upon an alleged breach of warranty, within thirteen months from the date within the warranty period on which the defect is or should have been discovered by Buyer.
6. **LIMITATION OF LIABILITY.** UPON NOTIFICATION, SELLER WILL, AT ITS OPTION, REPAIR OR REPLACE A DEFECTIVE PRODUCT, OR REFUND THE PURCHASE PRICE. IN NO EVENT SHALL SELLER BE LIABLE TO BUYER FOR ANY SPECIAL, INDIRECT, INCIDENTAL OR CONSEQUENTIAL DAMAGES ARISING OUT OF, OR AS THE RESULT OF, THE SALE, DELIVERY, NON-DELIVERY, SERVICING, USE OR LOSS OF USE OF THE PRODUCTS OR ANY PART THEREOF, OR FOR ANY CHARGES OR EXPENSES OF ANY NATURE INCURRED WITHOUT SELLER'S WRITTEN CONSENT, EVEN IF SELLER HAS BEEN NEGLIGENT, WHETHER IN CONTRACT, TORT OR OTHER LEGAL THEORY. IN NO EVENT SHALL SELLER'S LIABILITY UNDER ANY CLAIM MADE BY BUYER EXCEED THE PURCHASE PRICE OF THE PRODUCTS.
7. **Contingencies.** Seller shall not be liable for any default or delay in performance if caused by circumstances beyond the reasonable control of Seller.
8. **User Responsibility.** The user, through its own analysis and testing, is solely responsible for making the final selection of the system and Product and assuring that all performance, endurance, maintenance, safety and warning requirements of the application are met. The user must analyze all aspects of the application and follow applicable industry standards and Product information. If Seller provides Product or system options, the user is responsible for determining that such data and specifications are suitable and sufficient for all applications and reasonably foreseeable uses of the Products or systems.
9. **Loss to Buyer's Property.** Any designs, tools, patterns, materials, drawings, confidential information or equipment furnished by Buyer or any other items which become Buyer's property, may be considered obsolete and may be destroyed by Seller after two consecutive years have elapsed without Buyer placing an order for the items which are manufactured using such property. Seller shall not be responsible for any loss or damage to such property while it is in Seller's possession or control.
10. **Special Tooling.** A tooling charge may be imposed for any special tooling, including without limitation, dies, fixtures, molds and patterns, acquired to manufacture Products. Such special tooling shall be and remain Seller's property notwithstanding payment of any charges by Buyer. In no event will Buyer acquire any interest in apparatus belonging to Seller which is utilized in the manufacture of the Products, even if such apparatus has been specially converted or adapted for such manufacture and notwithstanding any charges paid by Buyer. Unless otherwise agreed, Seller shall have the right to alter, discard or otherwise dispose of any special tooling or other property in its sole discretion at any time.
11. **Buyer's Obligation; Rights of Seller.** To secure payment of all sums due or otherwise, Seller shall retain a security interest in the goods delivered and this agreement shall be deemed a Security Agreement under the Uniform Commercial Code. Buyer authorizes Seller as its attorney to execute and file on Buyer's behalf all documents Seller deems necessary to perfect its security interest. Seller shall have a security interest in, and lien upon, any property of Buyer in Seller's possession as security for the payment of any amounts owed to Seller by Buyer.
12. **Improper use and Indemnity.** Buyer shall indemnify, defend, and hold Seller harmless from any claim, liability, damages, lawsuits, and costs (including attorney fees), whether for personal injury, property damage, patent, trademark or copyright infringement or any other claim, brought by or incurred by Buyer, Buyer's employees, or any other person, arising out of: (a) improper selection, improper application or other misuse of Products purchased by Buyer from Seller; (b) any act or omission, negligent or otherwise, of Buyer; (c) Seller's use of patterns, plans, drawings, or specifications furnished by Buyer to manufacture Product; or (d) Buyer's failure to comply with these terms and conditions. Seller shall not indemnify Buyer under any circumstance except as otherwise provided.
13. **Cancellations and Changes.** Orders shall not be subject to cancellation or change by Buyer for any reason, except with Seller's written consent and upon terms that will indemnify, defend and hold Seller harmless against all direct, incidental and consequential loss or damage. Seller may change product features, specifications, designs and availability with notice to Buyer.
14. **Limitation on Assignment.** Buyer may not assign its rights or obligations under this agreement without the prior written consent of Seller.
15. **Entire Agreement.** This agreement contains the entire agreement between the Buyer and Seller and constitutes the final, complete and exclusive expression of the terms of the agreement. All prior or contemporaneous written or oral agreements or negotiations with respect to the subject matter are herein merged.
16. **Waiver and Severability.** Failure to enforce any provision of this agreement will not waive that provision nor will any such failure prejudice Seller's right to enforce that provision in the future. Invalidation of any provision of this agreement by legislation or other rule of law shall not invalidate any other provision herein. The remaining provisions of this agreement will remain in full force and effect.
17. **Termination.** This agreement may be terminated by Seller for any reason and at any time by giving Buyer thirty (30) days written notice of termination. In addition, Seller may by written notice immediately terminate this agreement for the following: (a) Buyer commits a breach of any provision of this agreement (b) the appointment of a trustee, receiver or custodian for all or any part of Buyer's property (c) the filing of a petition for relief in bankruptcy of the other Party on its own behalf, or by a third party (d) an assignment for the benefit of creditors, or (e) the dissolution or liquidation of the Buyer.
18. **Governing Law.** This agreement and the sale and delivery of all Products hereunder shall be deemed to have taken place in and shall be governed and construed in accordance with the laws of the State of Ohio, as applicable to contracts executed and wholly performed therein and without regard to conflicts of laws principles. Buyer irrevocably agrees and consents to the exclusive jurisdiction and venue of the courts of Cuyahoga County, Ohio with respect to any dispute, controversy or claim arising out of or relating to this agreement. Disputes between the parties shall not be settled by arbitration unless, after a dispute has arisen, both parties expressly agree in writing to arbitrate the dispute.
19. **Indemnity for Infringement of Intellectual Property Rights.** Seller shall have no liability for infringement of any patents, trademarks, copyrights, trade dress, trade secrets or similar rights except as provided in this Section. Seller will defend and indemnify Buyer against allegations of infringement of U.S. patents, U.S. trademarks, copyrights, trade dress and trade secrets ("Intellectual Property Rights"). Seller will defend at its expense and will pay the cost of any settlement or damages awarded in an action brought against Buyer based on an allegation that a Product sold pursuant to this Agreement infringes the Intellectual Property Rights of a third party. Seller's obligation to defend and indemnify Buyer is contingent on Buyer notifying Seller within ten (10) days after Buyer becomes aware of such allegations of infringement, and Seller having sole control over the defense of any allegations or actions including all negotiations for settlement or compromise. If a Product is subject to a claim that it infringes the Intellectual Property Rights of a third party, Seller may, at its sole expense and option, procure for Buyer the right to continue using the Product, replace or modify the Product so as to make it non-infringing, or offer to accept return of the Product and return the purchase price less a reasonable allowance for depreciation. Notwithstanding the foregoing, Seller shall have no liability for claims of infringement based on information provided by Buyer, or directed to Products delivered hereunder for which the designs are specified in whole or part by Buyer, or infringements resulting from the modification, combination or use in a system of any Product sold hereunder. The foregoing provisions of this Section shall constitute Seller's sole and exclusive liability and Buyer's sole and exclusive remedy for infringement of Intellectual Property Rights.
20. **Taxes.** Unless otherwise indicated, all prices and charges are exclusive of excise, sales, use, property, occupational or like taxes which may be imposed by any taxing authority upon the manufacture, sale or delivery of Products.
21. **Equal Opportunity Clause.** For the performance of government contracts and where dollar value of the Products exceed \$10,000, the equal employment opportunity clauses in Executive Order 11246, VEVRAA, and 41 C.F.R. §§ 60-1.4(a), 60-741.5(a), and 60-250.4, are hereby incorporated.



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Parker Hannifin Corporation

About Parker Hannifin Corporation

Parker Hannifin is a leading global motion-control company dedicated to delivering premier customer service. A Fortune 500 corporation listed on the New York Stock Exchange (PH), our components and systems comprise over 1,400 product lines that control motion in some 1,000 industrial and aerospace markets. Parker is the only manufacturer to offer its customers a choice of hydraulic, pneumatic, and electromechanical motion-control solutions. Our Company has the largest distribution network in its field, with over 7,500 distributors serving nearly 400,000 customers worldwide.

Parker's Charter

To be a leading worldwide manufacturer of components and systems for the builders and users of durable goods. More specifically, we will design, market and manufacture products controlling motion, flow and pressure. We will achieve profitable growth through premier customer service.

Product Information

North American customers seeking product information, the location of a nearby distributor, or repair services will receive prompt attention by calling the Parker Product Information Center at our toll-free number: 1-800-C-PARKER (1-800-272-7537). In Europe, call 00800-C-PARKER-H (00800-2727-5374).

The Aerospace Group

is a leader in the development, design, manufacture and servicing of control systems and components for aerospace and related high-technology markets, while achieving growth through premier customer service.



The Climate & Industrial Controls Group

designs, manufactures and markets system-control and fluid-handling components and systems for refrigeration, air-conditioning and industrial customers worldwide.



The Fluid Connectors Group

designs, manufactures and markets rigid and flexible connectors, and associated products used in pneumatic and fluid systems.



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designs, produces and markets a full spectrum of hydraulic components and systems to builders and users of industrial and mobile machinery and equipment.



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designs, manufactures and markets quality filtration and clarification products, providing customers with the best value, quality, technical support, and global availability.



The Automation Group is a leading supplier of pneumatic and electromechanical components and systems to automation customers worldwide.



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is a global leader in the design, manufacture and distribution of high-quality critical flow components for worldwide process instrumentation, ultra-high-purity, medical and analytical applications.





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