Catalog No. 616

OILCO

LIQUID HANDLING SYSTEMS

Serving the World Since 1935

Top Loading & Bottom Loading Assemblies

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Proudly Designed and manufactured in the USA

Worldwide Service for Over 80 Years

OILCO Liquid Handling Systems (A Division of Valeur Corporation) has designed the most extensive line of swivel joints available to heavy industry for over three quarters of a century. Units range from 2" through 24" and are available in carbon steel, stainless steel and aluminum, with either o-ring or v-ring packing seals. Low torque, steam jacketed, high pressure and heavy duty designs with incorporated roller bearings completes the standard production catalog. OILCO also manufactures a large line of top and bottom loading assemblies, vapor recovery arms and floating suction units.

Blending quality assurance and manufacturing standards from ANSI, ISO, and Six Sigma techniques OILCO has the ability to remain fluid in the ever changing economic and technologically diversifying world. The entire product line can be modified to suit any project requirement and incorporated into either new or re-engineered systems. Based on traditional practice and adaptive innovation, OILCO has the ability to maintain a constant position in the petroleum and manufacturing industries.

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NFIB The Voice of Small Business® — The National Federation of Independent Business

PEI — The Petroleum Equipment Institute

ILTA — Independent Liquid Terminals Association

NJBIA — New Jersey Business and Industry Association

WPMA — Western Petroleum Marketers Association

NAHAD — National Association for Hose & Accessories Distribution

Water Environment Federation the water quality people® — The Water Environment Federation

AIST Association for Iron & Steel Technology — Association for Iron & Steel Technology

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Dedicated Quality
& Worldwide Service

History

In 1935, the original OILCO Corporation, through one of its divisions, introduced the first completely packaged loading assembly to the petroleum industry. This spirit of innovation, and commitment to quality and leadership which are the hallmarks of our philosophy, keep OILCO brand products at the forefront of the liquid handling industry today.

Today, OILCO Liquid Handling Systems designs, engineers, and manufactures a wide range of standard and specialty equipment. Every component is made of the finest materials and machined to precision tolerances. CNC and advanced milling operations ensure proper dimensional accuracy. Castings are tested three times throughout the manufacturing process to ensure absolute accuracy.

Loading arms and swivel joints are most often associated with the petroleum and petrochemical industries. The fact is, however, that these sturdy and versatile devices are used for liquid handling in a multitude of industries; metal manufacturing, marine loading and unloading, and bulk foods. The following is a brief review of the primary styles of liquid handling systems, and how they have helped industries flourish.

Loading Arms

Pressurized loading arms, articulated by swivel joints, provide a conduit for the transfer of liquids between fixed storage and a range of transport vehicles. Available in a variety of sizes and configurations, loading arms are constructed of carbon steel, stainless steel, aluminum, or any necessary combination of the aforementioned.

Standard pipe diameters:	2” – 6” counterbalances arms, 2” – 24” articulating arms
Arm extensions availability:	6’ – 10’ and top loaders may extend to 30 feet along the horizontal length of a truck tank
Top loading assemblies:	Pantograph and slide tubes dominated the 1950’s, utilizing cast iron counterweights in bucket and slide designs
Torsion spring counterbalance:	Introduced in 1951, has become the industry standard
Long rang boom type assemblies:	Introduced in 1953, expedited the loading of longer tank trucks
Bottom loading assemblies:	Surged in popularity in the 60’s and 70’s, largely reducing the risk of fire or site contamination due to overfill accidents

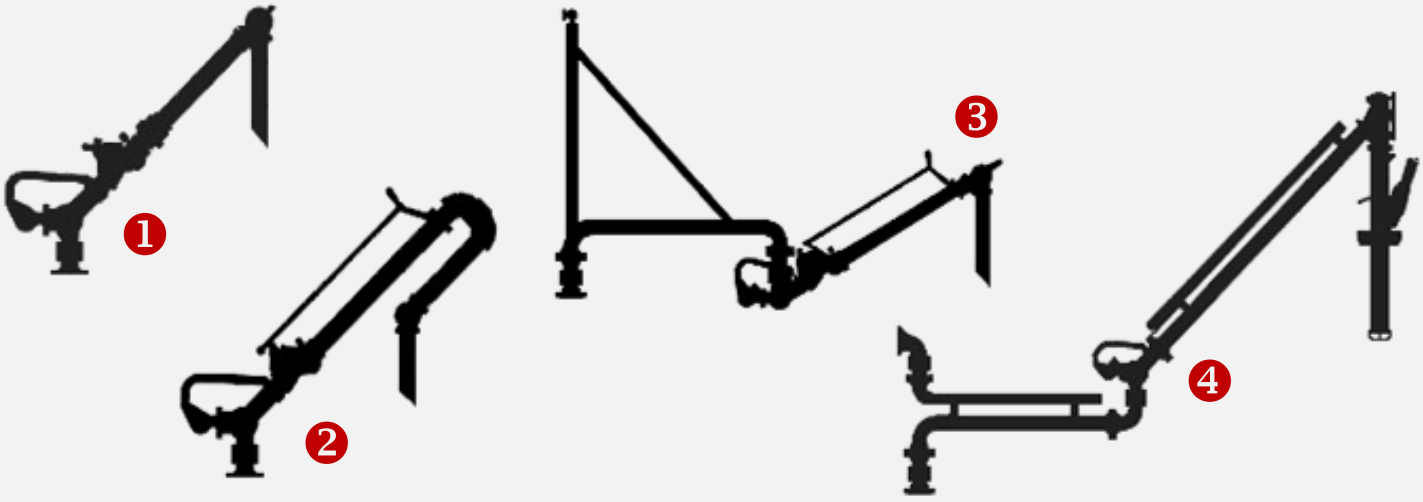
OILCO Liquid Handling Systems will alter design specifications for individual requirements and unique applications. The broad range of manufacturing includes; swivel joints, floating suction, top and bottom loaders, individual components, vapor recovery, marine loading, and waterway applications.

Quality

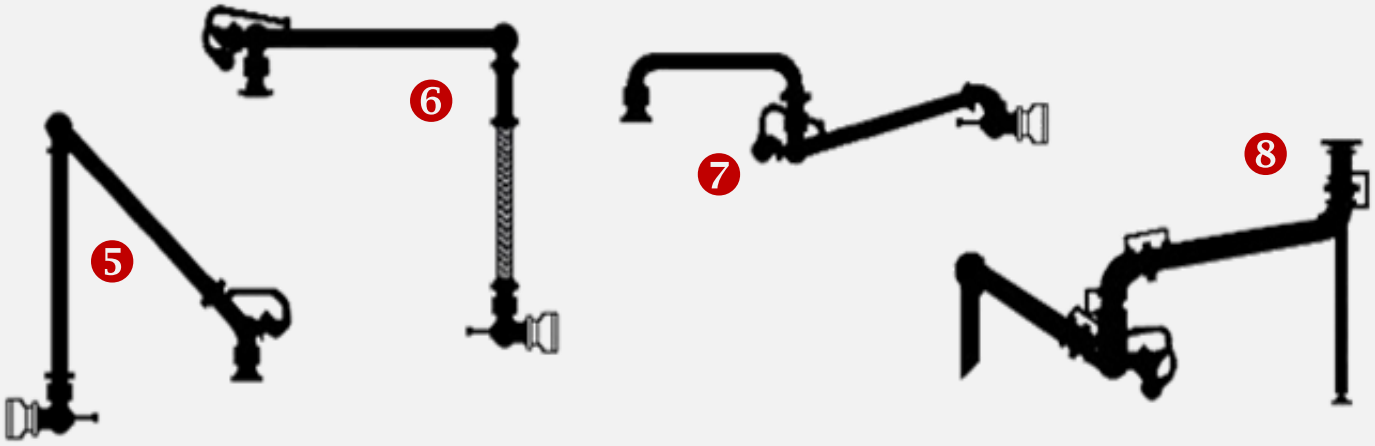
Every OILCO product must pass a battery of tests to assure you of the highest reliability and performance and to live up to the OILCO name. Castings are tested for operational and surface defects. Machined parts are scrutinized for tightness under pressure. Special manufacturing processes such as flame hardening are used to ensure long term product performance. After every OILCO swivel joint is assembled, it is tested again to ensure that swivels perform under maximum pressure or vacuum.

The Traditional Eight Basic Styles

OILCO Liquid Handling Systems manufactures loading assemblies rooted in the eight basic templates established in the 1950's. Initially developed to cover the array of transportation loading and unloading of the time, the designs still have merit, only requiring minor dimensional alterations to satisfy modern trucking equipment, updated seal capabilities, better chemical protection and more accurate monitoring. OILCO has the ability to help navigate customers through the typical changes found among these assemblies.



No. 1 The semi-rigid arm, originally designed with a slide tube, now offered only with fixed dimensions
No. 2 The pantograph style is the most popular multiple top position open loading assembly
No. 3 Long range booms, supported with pillow block or unsupported without "A" frame structure
No. 4 Vapor recovery systems based on boom assemblies with piggyback hose supports



No. 5 The "A-Frame" bottom loader, offered as rigid or flexible hose unit can be used in crossover
No. 6 Horizontal design used to replace counterweights in multi-fill positioning with up to five units
No. 7 Low profile bottom transfer arm for side or undercarriage hookup connections
No. 8 Custom steam jacket design for temperature control operations

Component Selection for Loading Assemblies

OILCO Liquid Handling Systems offers the widest array of swivel joints from 2” through 24” size. When considering loading arms specifically, the chemical qualities of the product and the moment loads required are central to selection. The proper swivel joint will maintain performance characteristics, extend service life and reduce the frequency of larger scale maintenance programs.

The 80 and 90 Series swivel joints manufactured by OILCO offer two distinct packing chamber options. And the utilization of tapered roller bearings in the 857 and 2000 Series units will cover the higher moment loads experienced by longer and wider assemblies.

The 80 Series O-Ring Type Swivel Joint

The 80 Series swivel joint is a leak proof, low maintenance design. It has widely spaced ball races allowing for better alignment and longer packing life. Flow restriction and internal turbulence are held to a minimum with a smooth bore design. The single seal point will operate under both a vacuum and a pressure environment. And the felt dust seal prevents all foreign matter from entering the swivel chamber.

Designed as the basic workhorse of the swivel joint world, the 80 Series is a ball bearing, single point seal design with a felt dust seal backup that allows for an endless number of applications. The 80 Series is available in carbon steel, stainless steel T-316, and aluminum. Sizes range from 2" to 6" in all materials. In addition, an 880 Series cast aluminum variant is available which can help reduce overall cost yet maintain the overall o-ring series characteristics.

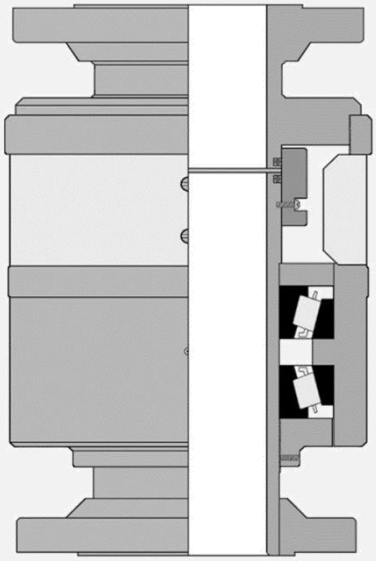
The 90 Series V-Ring Type Swivel Joint

The unquestionable sales and performance leader of the OILCO swivel joint line. The 90 Series swivel joint is designed with a three "V" ring seal configuration that is spring loaded and self-adjusting for normal wear. The incorporation of these "V" rings maintains a constant optimal pressure, securing a reliable seal long after conventional single rings or compression seals may be compromised.

OILCO has also developed a secondary manufacturing process specifically for the 90 Series swivel joints, creating the "low torque" (LT) version. These extensively treated swivels reduce the amount of torque up to 65% as compared with conventional swivels. Friction in the sealing and ball race surfaces are dramatically reduced, therefore providing a swivel joint that can be used in damage critical environment. By far, this swivel joint covers the widest range of production and safety considerations in the market today. And with sizing from 1.5” through 24”, no project is out of reach for this line of performance swivels.

Model 857-F Riser Swivel Joint

Designed nearly five decades ago, the Model 857-F was engineered and manufactured to support the multitude of counterweighted hose loaders outfitting the west coast terminals throughout California. Due to the high moment loads on larger loading assemblies, the 857-F incorporated Timken® tapered roller bearings in the mechanical chamber. This allowed for the intense bending moment at the riser and resolved all associated fatiguing issues at the base.



Consideration was also given to the maintenance need of the arms in service at the terminal facilities. Due to the high unit weight of these counterweighted systems, removing them from service offered a lengthy disassembly operation along with the necessity of a maintenance team. To resolve this issue, the 857-F was constructed with a shielded removable seal. The dual o-ring compartment is enclosed with a heavy wall locking collar and successfully allows for the various flow rates required by the customers. With only standard tools, the main pressures seals can be removed and new o-rings installed in a matter of minutes. This innovation resulted in a maintenance plan that did not require any disassembly and only a single technician.

The Model 857-F has a reported minimal performance lifespan of 20 years and in cases where the unit was not taxed to its operation limits, more than 30 years. The Model 857-F was, and continues to be, a consistent, reliable, and efficient riser swivel joint design.

2000 Series Dual Tapered Roller Bearings

The OILCO 2000 Series offers the best load carrying capacity in the industry. Unequalled in durability and overall moment ratings, combined with virtually friction free movement and minimal seal wear, there is simply no other swivel joint that measures up to its performance level.

Timken® roller bearings are proven stronger than any other conventional bearings. And put inside the precision CNC milled 2000 Series swivel joint spool, permanent alignment is assured. Such is the confidence in the manufacturing of the 2000 Series, the bearings are guaranteed by OILCO for the life of the joint. Restrictions apply.

The OILCO 2000 Series is offered in carbon steel, stainless steel T-316 and aluminum. Packing seal material is Buna-N (standard) but Viton, Teflon®, Nitrile, Kalrez®, Chemrez®, EPDM and EPR are available. The 2000 Series has a wide range of availability – 2” through 12”. And all styles are available in threaded, flanged, and butt weld connections.

Swivel Joint Styles

The Eight Traditional Styles	
Style 10 (3 Planes of Rotation)	**Style 20** (1 Plane of Rotation)
	
Style 30 (1 Plane of Rotation)	**Style 40** (1 Plane of Rotation)
	
Style 50 (2 Planes of Rotation)	**Style 60** (2 Planes of Rotation)
	
Style 70 (2 Planes of Rotation)	**Style 80** (3 Planes of Rotation)
	

Any Series . . . .

Any Connection . . . .

OILCO Liquid Handling Systems manufactures the most extensive line of swivel joints available. The foundation o-ring 80 Series compiles the largest component makeup for loading arm in the world today in assemblies ranging from 2" through 6" size. Both affordable and reliable, the dual raceway, simple pressure seal construction can handle much of the industry's basic needs.

The 90 Series offers the added protection of triple seals and a spring energized packing chamber. For asphalt loading assemblies requiring steam jacketing, the 90 Series is the choice to make due to the enlarged profile. Where insulation and electric heat wrapping is utilized, the 90 Series remains the recommendation due to the longer expanse of metal which retains a more even heat dispersion pattern, aiding the performance of the mechanical chamber.

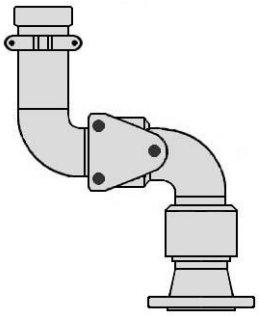
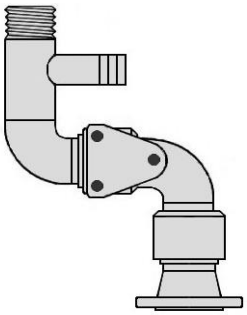
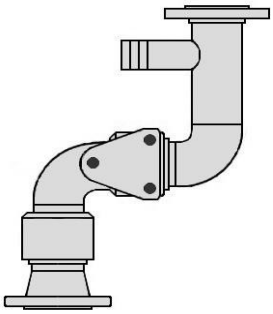
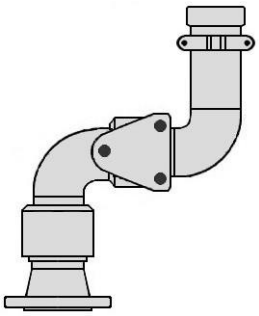
All OILCO swivel joints are manufactured with the end connection options of TTMA tank truck flanges, weld neck flanges, female and male NPT couplies of varying pressures and butt weld beveled ends for field installation. The configuration of the connections is based on customer specifications. OILCO manufactures and maintains a steady stock of swivel joint spools in all sizes and series. Stainless steel, carbon steel and aluminum are also available in each of the styles and series unless where either critical ability or tolerances are not compromised.

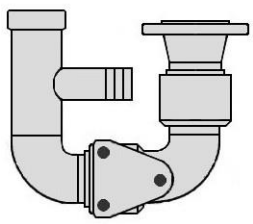
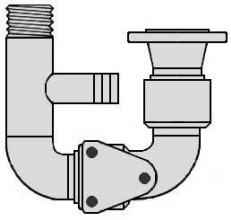
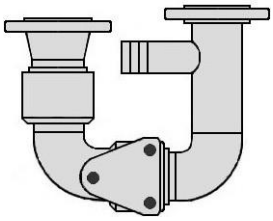
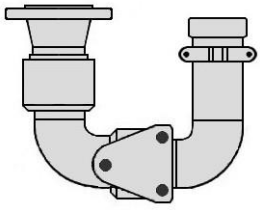
The Style 50 and Style 70 are commonly utilized for torsion spring counterbalance points and can be configured in either an upfeed or downfeed orientation. The units can be manufactured for use with the Model 640, 641 or 645 spring assemblies in either left or right hand plans.

Torsion Spring Counterbalance Swivel Joint Configurations

Plan, Feed and Torsion Spring Assignment

OILCO Liquid Handling Systems manufactures each of the major configurations of swivel joints in conjunction with the torsion spring counterbalance. Each unit (i.e. – the single spring Model 641, the double spring Model 640, and the double-double spring Model 645) is available for mounting on every style 50 or style 70 swivel joint. Every swivel joint configuration is also available with any number of inlet and outlet combinations; male threaded, flanged, or female half coupling. OILCO can design the counterbalance swivel joint units to be piggable (as seen to the right in the steam jacketed model), welded construction, or engineered to required specifications by the customer to meet project needs.

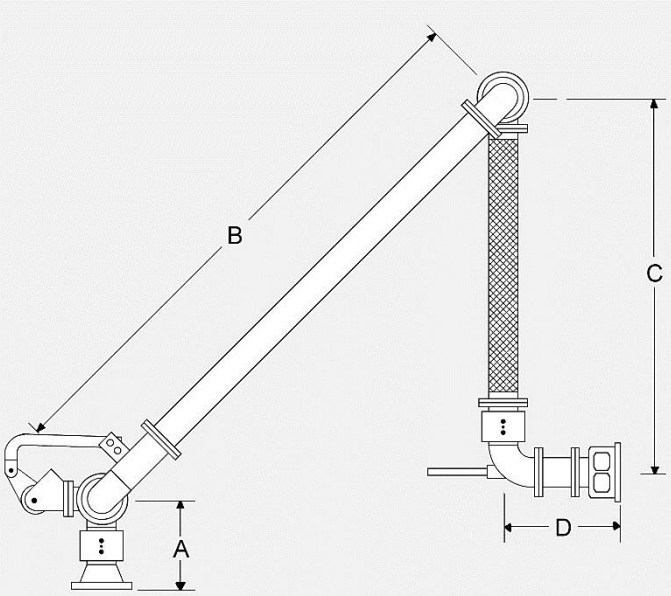
Upfeed Riser Swivel Joint Orientation			
			
Left Hand Plan 150# RF Inlet X Female NPT 641 Mounting	Left Hand Plan 150# RF Inlet X Male NPT 640 / 645 Mounting	Right Hand Plan 150# RF Inlet X 150# RF 640 / 645 Mounting	Right Hand Plan 150# RF Inlet X Female NPT 641 Mounting

Downfeed Riser Swivel Joint Orientation			
			
Left Hand Plan 150# RF Inlet X Female NPT 640 / 645 Mounting	Left Hand Plan 150# RF Inlet X Male NPT 640 / 645 Mounting	Right Hand Plan 150# RF Inlet X 150# RF 640 / 645 Mounting	Right Hand Plan 150# RF Inlet X Female NPT 641 Mounting

Note: When determining the orientation of an existing manufactured counterbalance swivel joint, the double bolt pattern on the plate will indicate direction. Two holes on the right, right hand. Two holes on the left, left hand. It is also critical to note the forward attachment linkage point. If it is a clamp design over the outboard end, it is a 641.

Available Spring Tension	*Moment Load Capacity*
"D" Spring, Left & Right Hand Wound	3,000 in / lbs each
"P" Spring, Left & Right Hand Wound	5,000 in / lbs each

Model 754-F
Flexible Hose Bottom Loader

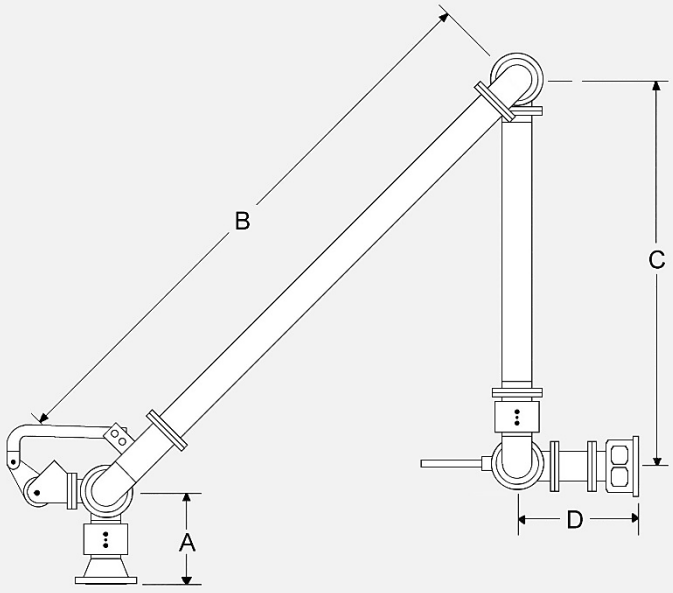


The Model 754-F is the worldwide leader for bottom loading design. This flexible hose loader conforms to the recommended API envelope for modern truck construction. The Model 754 can either be stored in a limited space with reduced dimensions or multiple units can be arranged in a crossover arrangement for up to 5 service positions.

Standard swivels are 80 Series with Viton “A” and the materials of construction is carbon steel and aluminum with a stainless steel single braided hose. The optional outlet swivel joint is typically a style 30 with straight handle and paired with a 6” optional spacer spool and API dry break coupler.

Standard Dimensions				
Size	A	B	C	D
2”	9.1”	60”	72”	21”
3”	10.2”	60”	72”	21”
4”	11.6”	60”	72”	21”

Model 754-FR
Rigid Type Bottom Loader

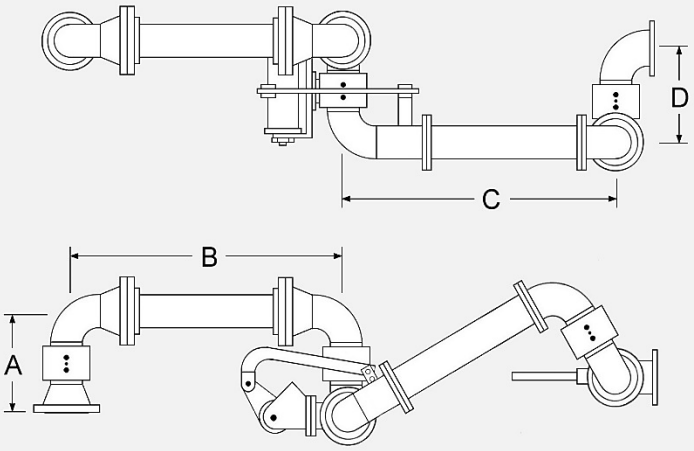


The Model 754-FR is the rigid version of the flexible hose bottom loader. This A-Frame loader conforms to the recommended API envelope for modern truck construction. The Model 754-FR can either be stored in a limited space with reduced dimensions or multiple units can be arranged in a crossover arrangement for up to 5 service positions.

Standard swivels are 80 Series with Viton “A” and the materials of construction is carbon steel and aluminum. The outlet swivel joint is a style 50 with straight handle and paired with a 6” optional spacer spool and API dry break coupler.

Standard Dimensions				
Size	A	B	C	D
2”	9.1”	60”	72”	21”
3”	10.2”	60”	72”	21”
4”	11.6”	60”	72”	21”

Model 752-F
Bottom Transfer Loader

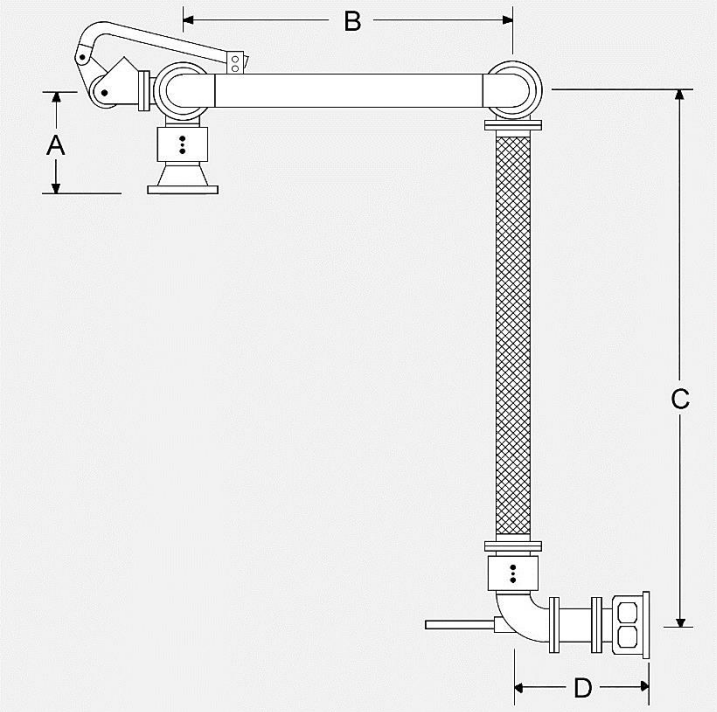


The Model 752-F is a low profile fueling transfer design. Adjustable for varying elevations and degrees of loading, the standard riser swivel point is at ground level with optional custom supported positions. The torsion spring mounting bracket is nestled within the assembly silhouette for tight spaces. Secondary arms can be installed in either an upfeed or downfeed position, as required by customer specifications.

Ideal for use in rail car, tank truck, and aviation servicing and refueling centers. Standard swivels are 80 Series with Viton "A" and the materials of construction is carbon steel and aluminum. The optional equipment is a 6" optional spacer spool and API dry break coupler.

Standard Dimensions				
Size	A	B	C	D
2"	9.4"	66"	66"	6.8"
3"	10.6"	66"	66"	10.6"
4"	13.8"	66"	66"	12.6"

Model 704-F
Horizontal Flexible Hose Loader

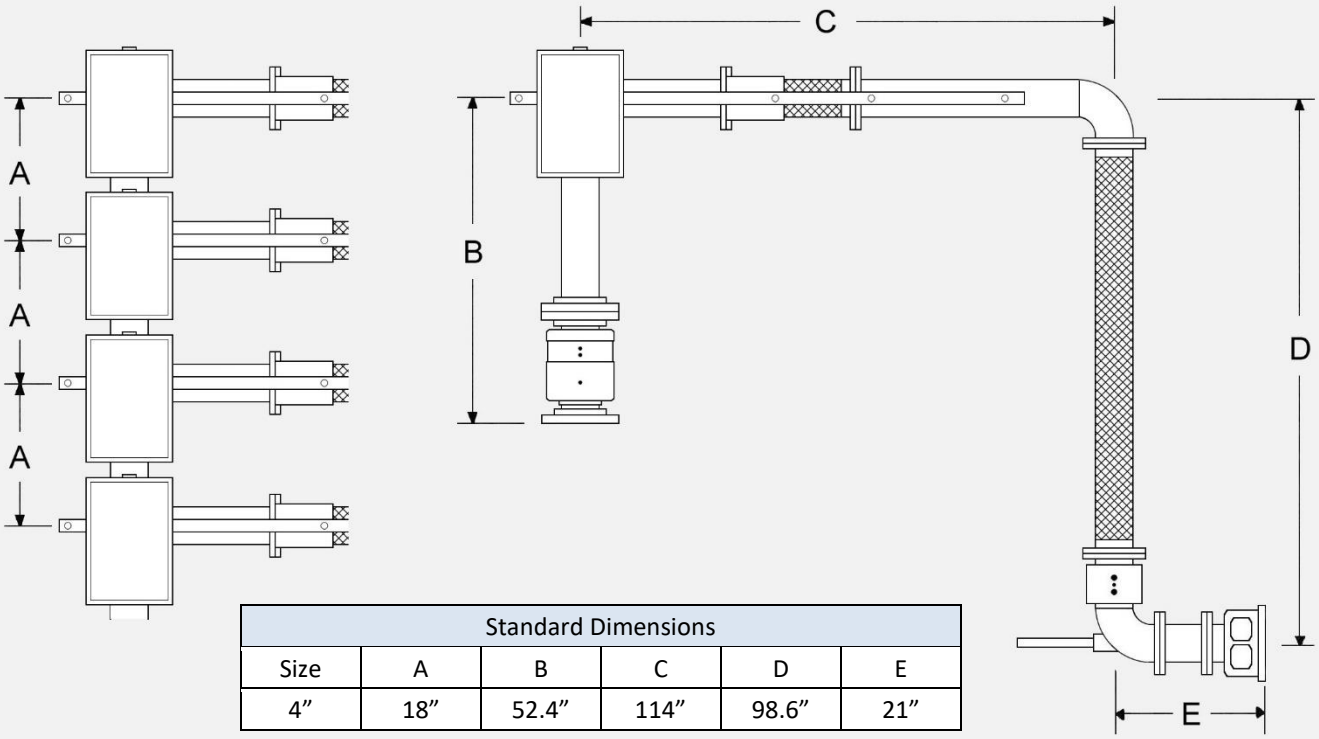


The Model 704-F is the torsion spring counterbalance replacement for traditional slide weight style overhead loading assemblies. Engineered for short range and compact placement, the 704-F can be offered in a stackable arrangement with varying hose length. For single spaced placement the horizontal length may be adjusted to give maximum articulation range.

Standard swivels are 80 Series with Viton "A" and the materials of construction is carbon steel and aluminum with a stainless steel single braided hose. The optional outlet swivel joint is typically a style 30 with straight handle and paired with a 6" optional spacer spool and API dry break coupler.

Standard Dimensions				
Size	A	B	C	D
2"	9.1"	52"	104"	21"
3"	10.2"	52"	104"	21"
4"	11.6"	52"	104"	21"

Slide Weight
Bottom Loading



Standard Dimensions					
Size	A	B	C	D	E
4”	18”	52.4”	114”	98.6”	21”

Model 773-FCW Flexible Hose Bottom Loader

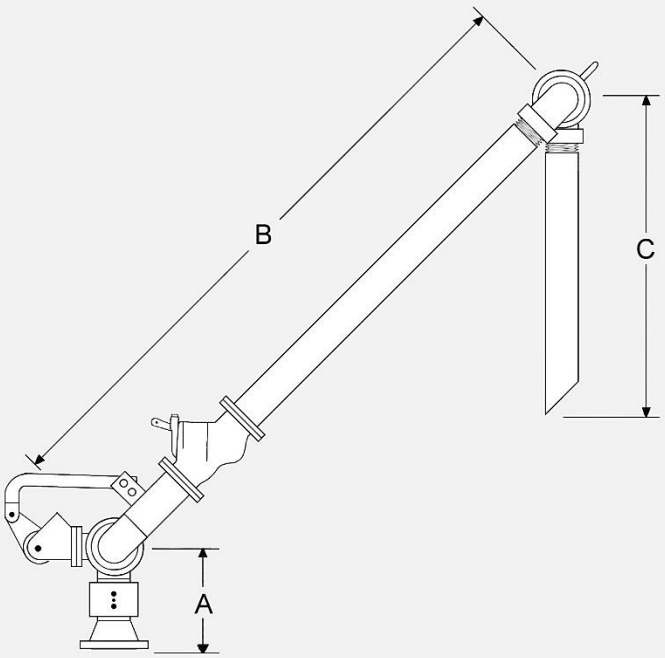
The Model 773-FCW Flexible Hose Bottom Loader is a ballast-type counterweighted arm designed for ease of handling, low maintenance, and long reach. The hollow shell design of the counterweight utilizes lead shot and a sliding lock to place the weights in either a forward position, or as far back as necessary to insure greater coupling ability and operation. This design permits closer riser spacing when required, and the vertical heights can be reduced as meter and riser configuration need not allow for any bucket travel.

The maximum reach of 114” conforms to the API RP-1004 Envelope when the tank truck is parked within 12” of the drop hose. When four loading assemblies are placed on 18” centers, the crossover characteristics will allow for complete coverage of the entire API Envelope. Standard materials of construction are carbon steel and aluminum with a stainless steel single braided hose.

The Model 857-F Riser Swivel Joint incorporates a dual set of tapered Timken® Roller Bearings affording friction free movement and assures permanent alignment and predictable performance under heavy loads. With the removable seal design, the packing material can be changed in the field without disconnection from the loading assembly in 15 minutes. The riser swivel joint component is a variable which can be altered by the customer for other OILCO swivels, depending on the project requirements and overall loading arm dimensions.

Packing seal material is standard Viton “A” with available options in Buna-N, Teflon®, Nitrile, Kalrez®, and Chemrez®. Custom configurations can be manufactured per project demands.

Model 755-F
Rigid A-Frame Loader

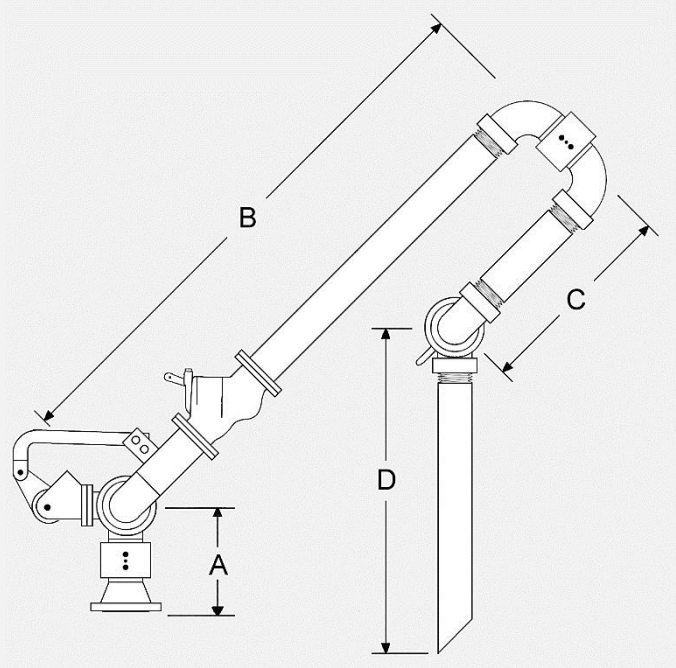


The Model 755-F is the simple and popular fixed reach option for top loading facilities. Standard torsion spring counterbalances offer extended service life, minimal adjustments over time, and a limited swing radius necessary for multiple positions. An optional remote control handle is available for single operator spot filling procedures.

Standard swivels are 80 Series with Viton "A" but various o-ring alternatives can be provided per the standard swivel joint line. Materials of construction is carbon steel and aluminum. Typical inlet connections are 150# RF ANSI flanges, with heavy duty female couplings for the 2" model.

Standard Dimensions			
Size	A	B	C
2"	9.1"	120"	48"
3"	10.2"	120"	48"
4"	11.6"	120"	48"

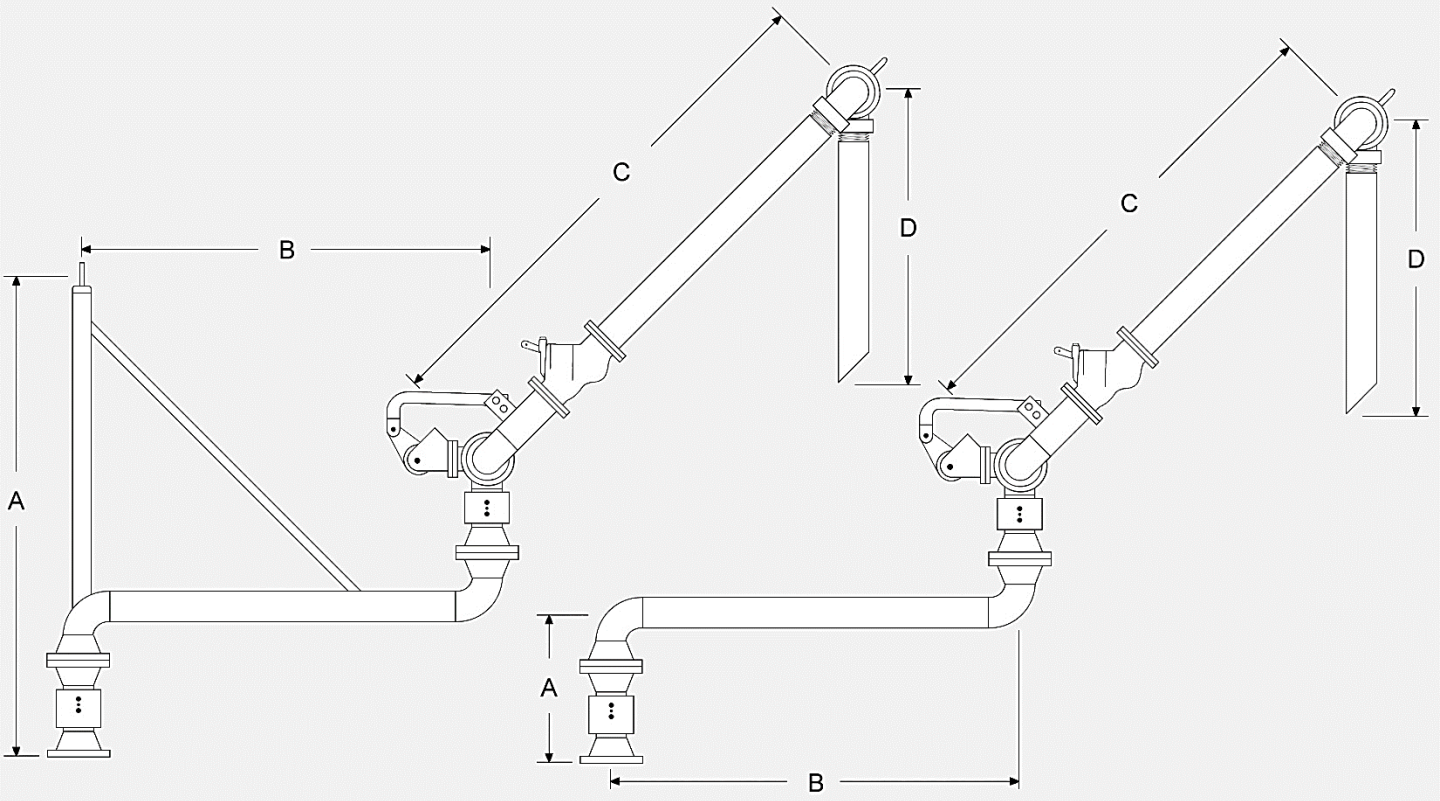
Model 756-F
Pantograph Style Loader



A replacement option for the antiquated sliding sleeve style top loader, the Model 756-F Pantograph is a dry line assembly designed to operate over varying manhole locations. reaches. Extension ability up to 9'6" for standard arms, while extended reaches can be afforded in the 1156-F model. Standard materials of construction are carbon steel and aluminum with an optional remote control handle for the horizontal deadman valve.

Ideal for use in rail car, tank truck, and aviation servicing and refueling centers. Standard swivels are 80 Series with Viton "A" but various o-ring alternatives can be provided per the standard swivel joint line.

Standard Dimensions				
Size	A	B	C	D
2"	9.1"	84"	24"	48"
3"	10.2"	84"	24"	48"
4"	11.6"	84"	24"	48"



Model 762-F Supported Boom Assembly

The Model 762-F Top Loading Boom Assembly is a supported long range loading assembly designed for use in large transport loading where reach is a critical element. This top loader configuration is a heavy duty, heavy use, and high flow unit. A pillow block and cap assembly ties in the supported boom assembly to a fixed mounting rack point. The riser swivel joint is a standard 90 Series, but is often upgraded to either a split flange 190 Series or Model 857 tapered roller bearing unit.

Model 763-F Unsupported Boom Assembly

In conditions that do not permit a fully supported boom structure, the Model 763-F Unsupported Top Loading Assembly can replace the 762-F, allowing for similar boom coverage. The riser swivel should be a heavy duty unit capable of carrying increased loads due to the absence of a support boom structure (e.g. – OILCO split flange and Model 857 units).

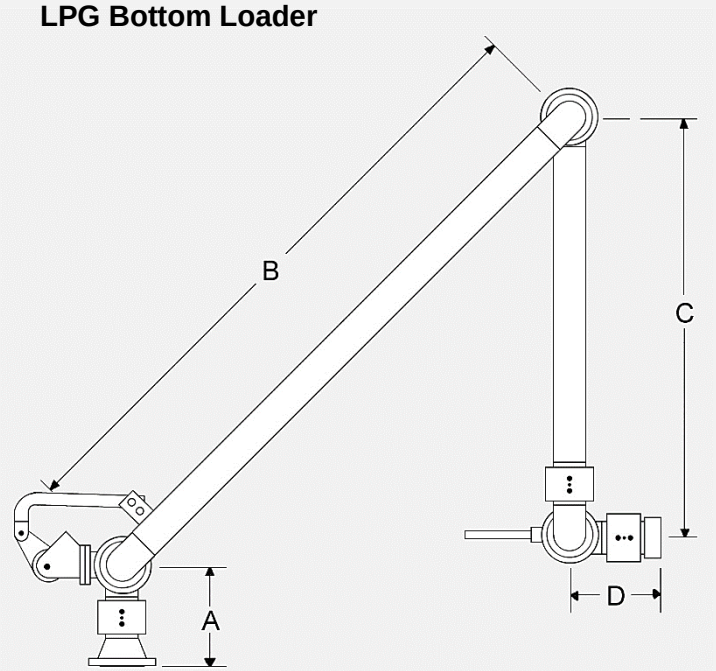
Construction materials are carbon steel and aluminum, but stainless steel T-316 is available. Packing seal material is standard Viton “A” with available options in Buna-N, Teflon®, Nitrile, Kalrez®, and Chemrez®. Custom configurations can be manufactured per project demands.

Model 762-F Standard Dimensions				
Size	A	B	C	D
2”	81.9”	78”	78”	48”
3”	82.6”	78”	78”	48”
4”	84.7”	78”	78”	48”

Model 763-F Standard Dimensions				
Size	A	B	C	D
2”	14.4”	60”	84”	48”
3”	16.4”	60”	84”	48”
4”	10.7”	60”	84”	48”

Specialty Top & Bottom Loading Assemblies

Model 786-LPG
LPG Bottom Loader



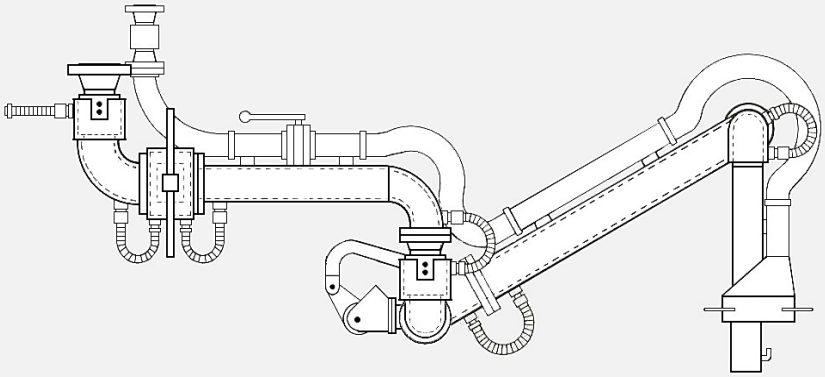
The Model 786-LPG is produced specifically for LPG service. A solid construction design with full penetration welds, the components are made with uniform ASTM schedule 40 specifications, a 300# ANSI inlet flange connection and a 3000 lb. heavy duty outlet coupling.

Standard swivels are 90 Series providing maximum seal surface contact and service life with Viton “A”. Materials of construction is carbon steel or stainless steel T-316. Torsion spring counterbalance for ease of movement

Standard reach is approximately 90” center to center, but dimensions can be altered to suit specific truck hook up positions.

Standard Dimensions				
Size	A	B	C	D
2”	9.1”	60”	60”	8.6”
3”	10.2”	60”	60”	10.6”
4”	11.6”	60”	60”	12.6”

Model 774-FSJ
Steam Jacket Loader



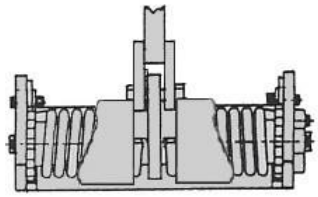
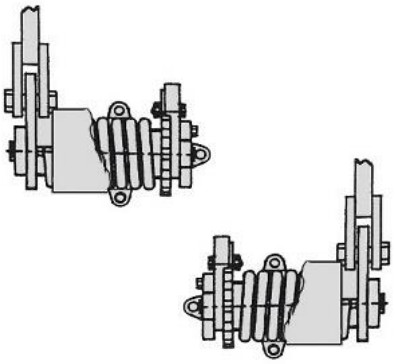
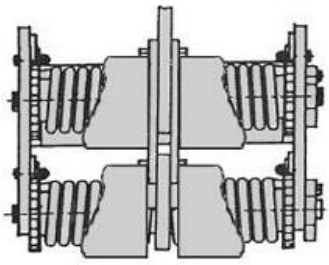
Sizes Available	2”, 3”, 4”, & 6”
Steam Chamber Pressure Rating	150 psi
Packing Seal Pressure Rating	500 psi
Packing Seal Temperature Rating	600°F max.

The Model 774-FSJ is the only 100% fully jacketed loading assembly available to the industry. It utilizes long radius internal elbows, making the entire assembly piggable for maintenance and be constructed as both a supported and unsupported unit, defined by load and dimensional characteristics. Stainless steel braided jumper hoses insure that steam circulation is progressive throughout the assembly, while a combination of rigid and flexible return lines provide passable movement of the steam charge.

Available in either carbon steel or stainless steel material. Per customer requirements and budget restrictions, the material of construction can vary, provided connection points remain compatible. Triple V-ring packing seal material is standard Viton “A” with all available specialty Vitons, Teflon®, Nitrile, or EPDM.

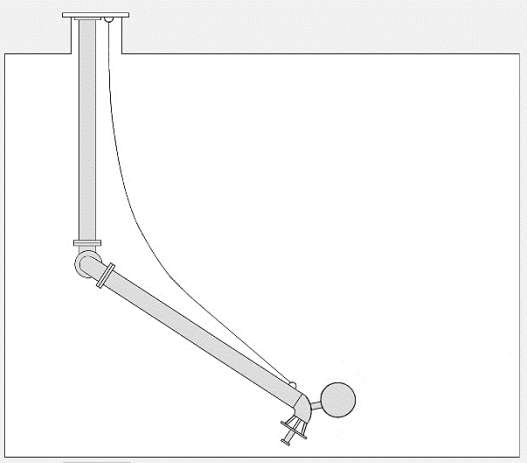
Torsion Spring Counterbalance Assemblies

OILCO Liquid Handling Systems follows the torsion spring design platform originated by our engineers over 50 years ago. The counterbalance assembly employs one, two or four various springs in or order to achieve appropriate loading arm balance. Each spring has a heavy gauge PVC cover sit over the assembly to reduce exposure to both the elements and the operators. Tension can be applied or reduced and the out-of-service position can be regulated to a near vertical limit. When adjusted to harmonized balance, the torsion spring will allow the loading arm to 'float' in the down position and require a simple lift by a single individual to begin the return. Each unit can be manufactured for right or left hand plan and standard or inverted mounting.

Series	Description	Configuration
640	**Model 640 Torsion Spring Counterbalance** **Dual Spring Design** 640-DC (Right or Left Hand) "D" Springs = 6,000 in/lbs carrying capacity 640-PC (Right or Left Hand) "P" Springs = 10,000 in/lbs carrying capacity	
641	**Model 641 Torsion Spring Counterbalance** **Single Spring Design** 641-DCL (Left Hand) "D" Springs = 3,000 in/lbs carrying capacity 641-DCR (Right Hand) "D" Springs = 3,000 in/lbs carrying capacity 641-PCL (Left Hand) "P" Springs = 5,000 in/lbs carrying capacity 641-PCR (Right Hand) "P" Springs = 5,000 in/lbs carrying capacity	
645	**Model 640 Torsion Spring Counterbalance** **Dual Spring Design** 645-DC (Right or Left Hand) "D" Springs = 12,000 in/lbs carrying capacity 645-PDC (Right or Left Hand) "P over D" Springs = 16,000 in/lbs carrying capacity 645-PC (Right or Left Hand) "P" Springs = 20,000 in/lbs carrying capacity	
640-T	**Transmission Link** Suitable for Models 640, 641, and 645 *(Please specify loading arm size and position when ordering)*	

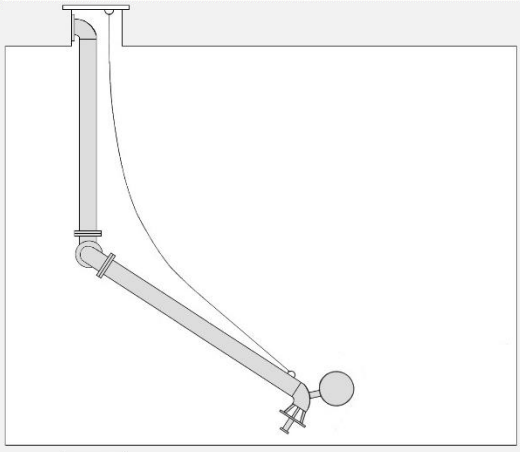
Floating Suction Assemblies

OILCO Liquid Handling Systems floating suction assemblies are designed for either above ground or buried tank systems. Submerged service swivel joints in either 80 or 90 Series provide stable alignment and reduced friction movement inside the tank. The bellmouth assembly and close single float design ensure clean product delivery by drawing fluid from near the surface.



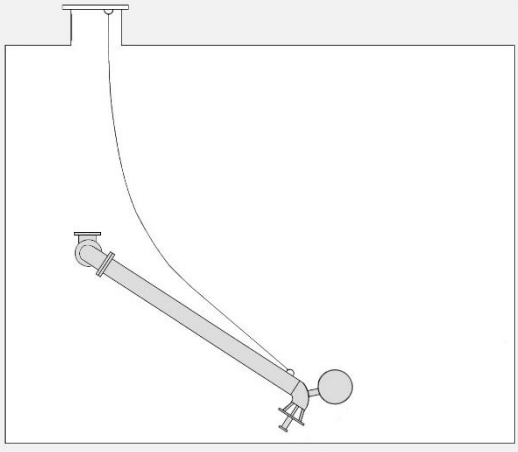
Type “A” Floating Suction

The Type “A” floating suction assembly is a mid-tank pivot position unit with a straight vertical pipe and primary arm length of 69” designed to suit a typical 10’-6” storage tank.



Type “B” Floating Suction

The Type “B” floating suction assembly has a mid-tank unit with straight vertical pipe mount similar to the Type “A”, but with a 90º elbow outlet. The primary arm length of 69” designed to suit a typical 10’-6” storage tank.

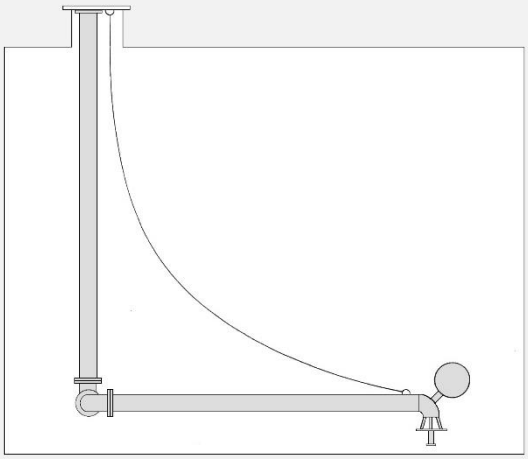


Type “C” Floating Suction

The Type “C” floating suction assembly is engineered for a mid-tank direct mounting instead of the vertical pipe arrangement. The primary arm length of 69” is designed to suit a typical 10’-6” storage tank.

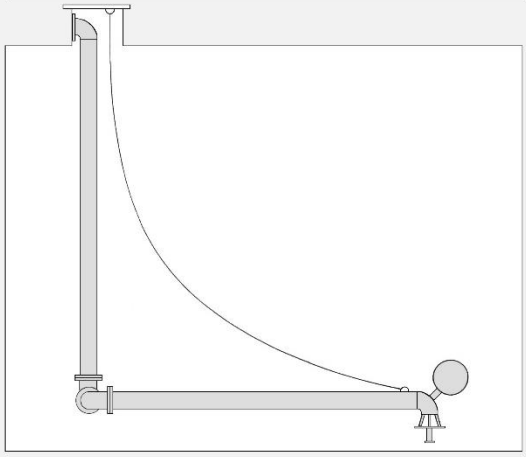
Floating Suction Assemblies

Floating suction assemblies are manufactured in aluminum, carbon steel and stainless steel materials. The permanently sealed dual raceway swivels (in either 80 or 90 Series) are provided with Buna-N packing as standard, with available Viton, Teflon®, Nitrile, Kalrez®, and Chemrez® compounds. All connections are flanged or threaded, based on customer specifications.



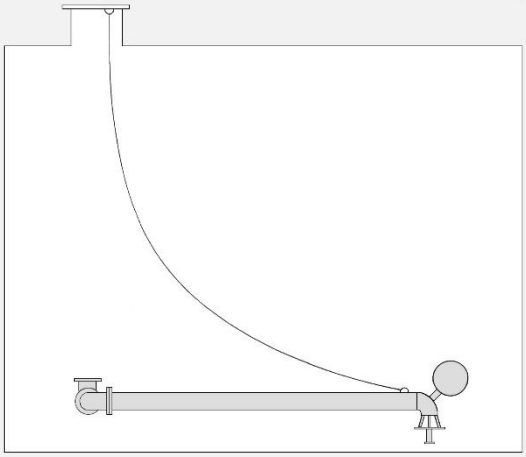
Type “D” Floating Suction

The Type “D” floating suction assembly is engineered as a low pivot position unit. It has a straight vertical pipe mount with a primary arm length of 120” designed to suit a typical 10’-6” storage tank.



Type “E” Floating Suction

The Type “E” floating suction assembly is engineered as a low pivot position unit. It has a straight vertical pipe mount with a 90º elbow outlet. The primary arm length is 120” designed to suit a typical 10’-6” storage tank.



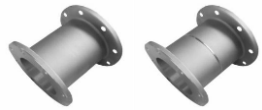
Type “F” Floating Suction

The Type “F” floating suction assembly is engineered as a low pivot direct mount unit. The primary arm length of 120” is designed to suit a typical 10’-6” storage tank.

Loading Assembly Accessories

OILCO Liquid Handling Systems offers a range of accessories and replacement options for both top and bottom loading assemblies. If you need additional information on any of the products shown or wish to inquire further about preventative maintenance programs or specialty items, please contact the factory and request further assistance.

Standard Top Loading Arm Accessories	
Model 19 Vacuum Breaker Brass with Viton "A" disc, 3/8" NPT **Model 19-A Vacuum Breaker** Aluminum with Viton "A" disc, ½" NPT **Model 19-PLK Vacuum Breaker** Chrome plated with kalrez disc, 3/8" NPT	
Aluminum Drop Tubes *Standard length is 4'* 40-A, Male NPT inlet with 45º Cutoff 40-ANF, TTMA flanged end connections 40-A25, Male NPT inlet with Model 25 flow deflector *Available in 2", 3" 4" and 6" sizes*	
Model "A" Remote Control Designed for standard horizontal loading valves and ball valves	

Standard Bottom Loading Arm Accessories	
Outboard Aluminum Spacer Spools *TTMA Flanged Ends* **4" 66-ANF,** 6" Overall Length **4" 66-ANFG,** 6" Overall Length with Sheering Groove	
4" Model 883-ANF-X Outboard Swivel A long radius version of the standard 883-ANF-X. Cast aluminum, TTMA flanged end connections with center elbow mounted boss to accommodate either straight or Type "D" shovel handle attachments.	
Model 258-GS **Outboard Horizontal Leveling Assembly** An optional outboard leveling assembly designed to assist bottom loading allowing the coupler to rest in a relatively secure horizontal position.	
Model 5300-B **Snap-On Type, API Dry Break Coupler** A 4" TTMA, five cam design for simple alignment and peak performance, RP-1004:2003 compliant. Removable seal offers Buna-N, Viton-B or Viton GFLT options. Easy ball type main handle for simple operation. Hard coat anodized aluminum (AL 356 T6). Dry weight: 20 lbs.	

Top Loading
Design Data Survey

OILCO Liquid Handling Systems manufacturers loading assemblies in either standard or project specific dimensions. The following data will help OILCO determine if there are any design elements that might restrict movement or hinder operations and performance. Be sure to note any additional equipment or structures that could impede the unit.

Tank Truck Top Loading

a. Overhead clearance to platform canopy or roof system: _____

b. Platform height from grade: _____

c. Overhead riser connection height from platform: _____

d. Connection height above platform floor: _____

e. Depth of island or platform to center of riser: _____

f. Position of truck from island or curbing: _____

g. Center to center reach from riser to truck: _____

h. Horizontal riser connection height from platform: _____

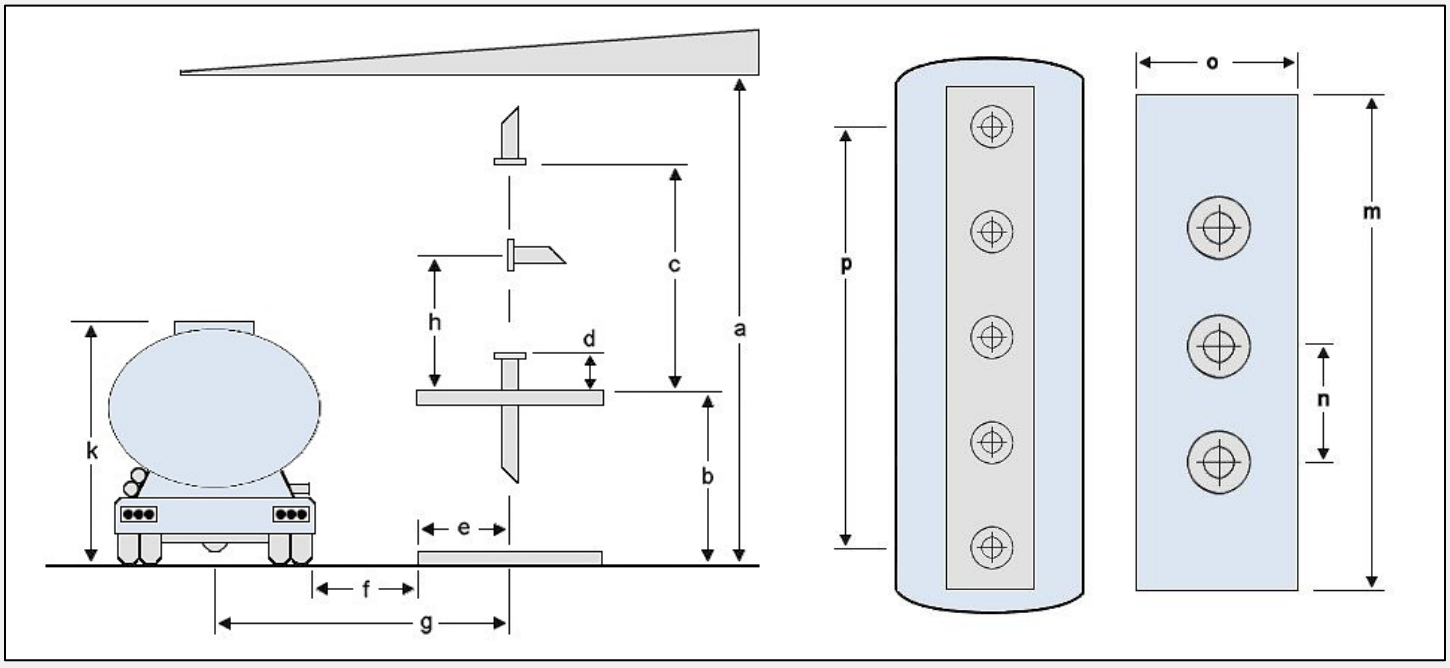
k. Overall vehicle height from grade: _____

m. Platform or service island length: _____

n. Riser spacing / number of risers: _____

o. Platform or service island width: _____

p. Overall range of hatch opening for service: _____



Bottom Loading
Design Data Survey

Tank Truck & Railcar Bottom Loading

a. Platform or service island length: _____

b. Riser spacing / number of risers: _____

c. Platform or service island width: _____

d. Coupler spacing / number of positions: _____

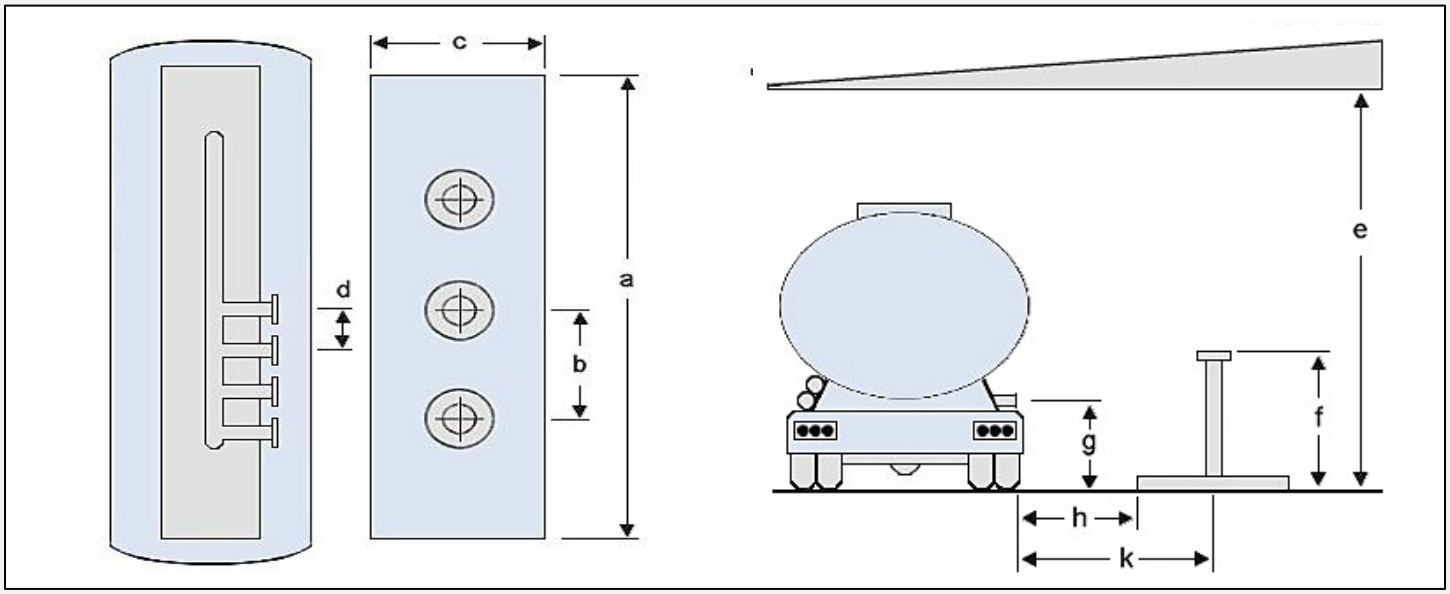
e. Overhead clearance to platform canopy or roof system: _____

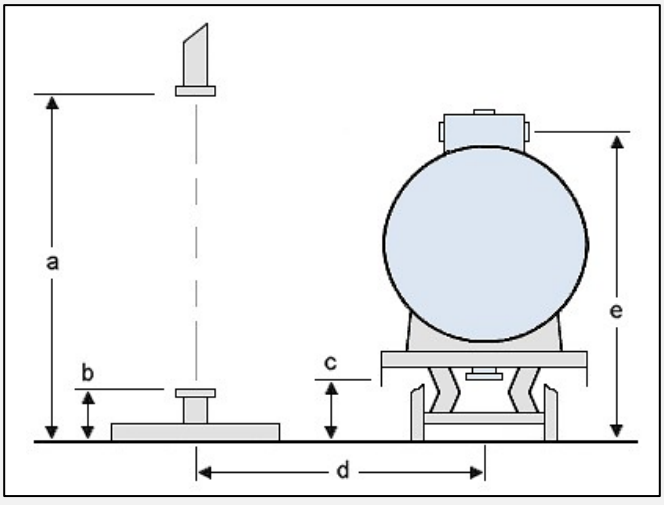
f. Riser height above grade level (including island): _____

g. Coupler connection height: _____

h. Position of truck from island or curbing: _____

k. Center to center reach from riser to truck: _____





a. Riser connection height above rail (overhead supply): _____

b. Riser connection height from grade (lower supply): _____

c. Railcar connection height from grade: _____

d. Center to center reach from riser to tank car: _____

e. Dome opening and/or connection height: _____

Chemical Resistance Chart
Seal Compatibility

Fluid	Metal			Seal Material				
Key: A = Excellent B = Good C = Fair / Poor D = Not Recommended	Aluminum	Carbon	Stainless	Buna-N	Viton	EPR Rubber	Butyl	Teflon
Acetate Solvents	A	A	A	D	D	D	D	A
Acetic Acid, aerated	B	D	A	C	C	B		A
Acetic Acid, Air Free	B	D	B	C	D	B		A
Acetic Acid, crude	C	C	B	D	D	B	B	A
Acetic Acid, glacial	A	D	A	B	D	B	B	A
Acetic Acid, pure	B	D	B	D	D	B	B	A
Acetic Acid, 10%	B	C	B	D	D	B	B	A
Acetic Acid, 80%	B	C	B	D	D	C		A
Acetic Acid Vapors	B		D	D	D	C	D	A
Acetone	A	A	A	D	D	A	A	A
Acetylene	A	A	A	B	A	A	A	A
Acrylonite	B	B	A	D	C	D	D	A
Alcohol, Amyl	A	B	A	B	B	A	A	A
Alcohol, Butyl	A	B	A	A	A	B	B	A
Alcohol, Ethyl	B	B	A	B	B	A	A	A
Alcohol, Isopropyl	B	B	B	B	A	A	A	A
Alcohol, Methyl	B	C	A	B	D	B	B	A
Alcohol, Propyl	A	B	A	B	A	A	A	A
Aluminum Chloride	C	C	B	A	A	A	A	A
Aluminum Flouride	C	D	C	A	A	A	A	A
Aluminum Potassium Sulfate	D		B	B	B	B		A
Aluminum Sulfate	C	D	B	A	A	A		A
Ammonia, Anhydrous Liquid	B	A	A	B	D	A	A	A
Ammonia, Aqueous	B	A	A	B	B	B	B	A
Ammonia, Gas, hot	B		A	C	D	B	B	A
Ammonia Solutions	B	B	A	B	D	A	A	A
Ammonium Chloride	C	C	B	B	A	A	A	A
Ammonium Hydroxide 28%	C	B	B	B	C	B	B	A
Ammonium Hydroxide, concentrate	C	C	B	D	C	B	B	A
Ammonium Nitrate	B	D	A	A	B	A	A	A
Ammonium Phosphate	C	D	B	A	A	A	A	A
Ammonium Phosphate, Di-basic	B	D	B	A	D	A	A	A
Ammonium Sulfate	C	C	B	A	D	A	A	A
Aniline	C	C	B	D	C	B	B	A
Asphalt Liquid	C	B	A	C	A	D	D	A
Barium Chloride	D	C	B	A	A	A	A	A
Barium Hydroxide	D	C	B	A	A		A	A
Barium Sulfide	D	C	B	A	A	A	A	A
Benzene (Benzol)	B	B	B	D	B	D	D	A
Benzine	*See Petroleum Ether*							
Borax (Sodium Borate)	C	C	A	B	A	A	A	A
Boric Acid	B	D	B	B	A	B		A
Butadiene	B	B	A	C	B	D	D	A
Butane	A	B	B	B	B	D	D	D
Butyl Acetate	B	B	B	D	D	B	B	A
Butyl Stearate	B		B	B	A	D	D	A
Butylcellosolve	A	A	A	D	D	B	B	A
Butylene	A	A	A	C	B	D	D	A
Calcium Acetate	C		A	B	D	A	A	A
Calcium Bisulfite	C	D	B	A	A	D	D	A
Calcium Chloride	C	C	B	A	A	A	B	A
Calcium Hydroxide	D	C	B	A	A	A	A	A
Calcium Nitrate	C	B	A	B	B	B	B	A
Carbonic Acid	A	D	A	D	B	B	B	A
Carbonic Acid (Phenol)	A	D	B	D	B	C	C	A
Carbon Dioxide Dry	A	A	A	A	B	B	B	A
Carbon Disulphide	A	B	A	A	A	D	D	A
Carbon Tetrachloride, dry	B	B	A	B	A	D	D	A
Carbon Tetrachloride, Wet	D	D	B	C	B	D	D	A
Caustic Potash	D	D	B	B		B	B	A
Caustic Soda	D	B	A	C	B	B	B	A
Cellosolve	B	B	B	D	D	B	B	A
Cellulose Acetate	B		B	D	D	B	B	A
Chlorine Gas, dry	C	B	B	D	B	B	C	A
Chlorobromomethane		B	A	D	A	C	C	A

Fluid	Metal			Seal Material				
Key: A = Excellent B = Good C = Fair / Poor D = Not Recommended	Aluminu	Carbon	Stainless	Buna-N	Viton	EPR	Butyl	Teflon
Chloroform, dry	D	B	A	D	B	D	D	A
Chromic Acid 50%	D	C	C	C	B	D	D	A
Citric Acid	B	D	A	B	A	A	A	A
Copper Acetate	D	C	A	B	D	A	A	A
Copper Cyanide	D		A	A	B	B		A
Copper Nitrite	D	D	B	A	A	B	B	A
Copper Sulfate	C	D	B	A	A	A	C	A
Cresote	B	B	A	A	A	D	D	A
Cresote Oil	B	B	B	C	A	D	D	A
Cresylic Acid	C	C	B	D	B	D	D	A
Cyclohexane	A	A	A	A	A	D	D	A
DDT	B	D	B	B	A	D	D	A
Detergents, synthetic	B		B	B	A	C		A
Dichloroethyl Ether (Chlorex)	B	B	B	D	C	C	C	A
Dowtherm	A	B	A	D	A	D		A
Ethane	A	C	B	A	A	D	D	A
Ethanol Amine	A	B	A	B	D	B	B	A
Ethers	A	A	A	D	C	C	C	A
Ethyl Acetate	A	B	B	D	D	B	B	A
Ethyl Cellulose	A	C	A	B	D	B	B	A
Ethyl Chloride, dry	B	B	A	B	B	B	B	B
Ethyl Chloride, wet	D	D	B	B	B	B	B	A
Ethylene Chloride	C		A	D	B	D	D	A
Ethylene Diamine	C	B	A	A	D	A	A	A
Ethylene Dichloride	D	B	A	D	B	C	C	A
Ethylene Glycol	A	B	B	A	A	A	A	A
Ethylene Oxide	B	B	B	D	C	C	C	A
Fatty Acids	B	D	A	B	A	C	C	A
Ferric Chloride	D	D	D	C	B	C	C	A
Ferric Sulfate	D	D	B	A	A	B	B	A
Formaldehyde, cold (Formalin)	A	A	A	B	D	B	B	A
Formaldehyde, hot (Formalin)	B	D	C	B	D	B	B	A
Formic Acid, cold	B	D	B	C	C	B	B	A
Formic Acid, hot	D	D	B	C	C	B	B	A
Freon Gas, dry	B	B	A	B	B	D	D	A
Freon 11, MF, 112, BF, 12, 13	B		A	B	B	D	D	A
Freon 21	B		A	D	D	D	D	A
Freon 22	A		A	D	D	B	B	A
Freon 113, TF	B		A	B	C	D	D	A
Fuel Oil	A	B	A	A	A	D	D	A
Furfural	A	A	A	D	D	B	B	A
Gas, Manufactured	B	B	B	A	A	C		A
Gas, Natural	B	B	A	A	A	C		A
Gas, Odorizers	A	B	B	B	A			A
Gasoline, Aviation	A	A	A	C	A	D	D	A
Gasoline, Leaded	A	A	A	B	A	D	D	A
Gasoline, Sour	A	B	A	B	A	D	D	A
Gasoline, Unleaded	A	A	A	B	A	D	D	A
Gelatin	A	D	A	A	A	A		A
Glucose	A	B	A	A	A	A	A	A
Glue	A	A	B	A	A	B		A
Glycerine (Glycerol)	A	C	A	A	A	A	A	A
Herbicides	*See specific chemical listing*							
Hexane	A	B	B	A	A	D		A
Hydraulic Oil, Petroleum Base	A	A	A	A	A	D	D	A
Hydrocyanic Acid	A	D	A	B	A	A	A	A
Hydrogen Gas, cold	A	B	A	B	A	A	A	A
Hydrogen Gas, hot	C	B	B	B		A	A	A
Hydrogen Peroxide, Concentrate	A	D	B	D	A	C	C	A
Hydrogen Peroxide, Dilute	A	D	B	B	A	B		A
Hydrogen Sulfide, Dry	A	B	A	C	D	A	A	A
Hydrogen Sulfide, Wet	B	C	B	D	D	A	A	A
Hypo (Sodium Thiosulfate)	B	D	A	A	A	B		A
Isobutyl Acetate	B	B	A	B	D	B	B	A
Isobutyl Alcohol	B	B	A	D	B	A	A	A

Chemical Resistance Chart
Seal Compatibility

Fluid	Metal			Seal Material				
Key: A = Excellent B = Good C = Fair / Poor D = Not Recommended	Aluminu	Carbon	Stainless	Buna-N	Viton	EPR	Butyl	Teflon
Iso-Butane	A	A	A	A	D	D	D	A
Iso-Butanol	A	B	A	A	B	B	B	A
Iso-Propanol	B	B	B	B	A	A	A	A
Iso-Propylamine	A	B	A		A	A	A	A
Isopropyl Acetate	A	B	B	D	B	B	B	A
Jet Fuels, P-4, P-5 and P-6	A	A	A	B	A	D	D	A
Kerosene	A	B	A	A	A	D	D	A
Lacquer (and solvent)	A	C	A	D	D	D	D	A
Lactic Acid, concentrated hot	C	D	B	D	B	D	D	A
Lactic Acid Dilute, cold	A	D	A	B	A	B	B	A
Lactic Acid Dilute, hot	B	D	A	C	D	C	C	A
Lime Sulphur Solutions	C	B	A	D	A	A	A	A
LPG	A	B	A	A	A	D	D	A
Magnesium Chloride	D	C	B	A	A	A		A
Magnesium Hydroxide	D	B	A	B	A	B		A
Magnesium Sulfate	D	B	A	A	A	B	B	A
Mercury	B	A	A	A	A	A	A	A
Methane	A	B	B	A	A	D	D	A
Methanol	B	C	A	B	D	B	B	A
Methyl Cellosolve	A	B	A	C	D	B		A
Methyl Chloride	D	B	A	D	B	D	D	A
Methyl Ethyl Keytone	A	A	A	D	D	A	A	A
Methyl Isobutyle Ketone	A	A	A	D	D	A	A	A
Mineral Oils	A	B	A	A	A	D	D	A
Naptha	A	B	B	B	A	D	D	A
Napthalene	B	B	B	D	A	D		A
Napthenic Acid	B	B	A	C	A	D	D	A
Natural Gas, Sour	B	B	A	A	A	D		A
Nickel Chloride	D	D	B	A	A	B	B	A
Nickel Sulfate	D	D	B	A	A	A	A	A
Nitric Acid 30%	D	D	A	C	B	B	B	A
Nitric Acid 80%	B	D	B	D	C	D	D	A
Nitric Acid 100%	B	D	A	D	C	D	D	A
Nitrobenzene	B	B	A	D	C	D	C	A
Nitrogen	A	A	A	A	A	A	A	A
Nitrogen Fertilizer Solutions	B		A	B	A	B	B	A
N. Octane	A	A	A	B	A	D	D	A
Octyl Alcohol	B	B	A	B	B	B	B	A
Oils, Petroleum Refined	A	A	A	A	A	D	D	A
Oils, Petroleum Sour	A	B	A	B	A	D	D	A
Oils, Water Mixture	A	B	A	A	A	D	D	A
Oleic Acid	B	C	B	C	B	D	D	A
Oleum	B	B	B	D	B	D	D	A
Oxalic Acid	C	D	B	C	A	B	B	A
Palmitric Acid	B	C	B	B	A	D	D	A
Perchlorethylene, dry	B	B	A	C	A	D	D	A
Pesticides	*See specific chemical listing*							
Petroleum Ether (Naptha)	A	A	A	A	A	D	D	A
Phenol	A	D	A	D	B	D		A
Phosphoric Acid 10%	D	D	B	B	B	B	B	A
Phosphoric Acid 50%	D	D	B	C	B	B	B	A
Phosphoric Acid 80%	D	B	A	C	B	B	B	A
Phosphoric Acid 85%	D	C	B	D	B	B	B	A
Phthalic Anhydride	B	C	B	C	A	C	C	A
Picric Acid	C	D	B	C	B	B	B	A
Potassium Acetate Solutions	D	B	A	B	D	A	B	A
Potassium Carbonate	D	B	B	A	A	B		A
Potassium Chloride	D	C	B	A	A	A	A	A
Potassium Cynate Solutions	B	D	A			B	B	A
Potassium Cyanide	D	B	B	A	A	A	A	A
Potassium Hydroxide, Dilute Cold	D	A	A	B	D	A	A	A
Potassium Hydroxide, Dilute Hot	D	B	A	B	D	A	A	A
Potassium Nitrite	A	B	B	A	A	A	A	A
Potassium Sulfate	A	B	A	A	A	A	A	A
Producer Gas	B	B	B	A	A	D	D	A

Fluid	Metal			Seal Material				
Key: A = Excellent B = Good C = Fair / Poor D = Not Recommended	Aluminu	Carbon	Stainless	Buna-N	Viton	EPR	Butyl	Teflon
Propionic Acid 20%	B	D	B			A	A	A
Propylene	A	A	A	D	A	D	D	A
Propylene Diamine	B	B	A	D	D	D	D	A
Propylene Dichloride	C	B	B	D	B	D	D	A
Propylene Glycol	A	B	B	A	A	B	B	A
Propylene Oxide	B	B	B	D	D	B	B	A
Resins & Rosins	A	C	A	C	A			A
Rubber or Latex Emulsions	A	B	A		A			A
Shellac – bleached & orange	A	A	A	A	C	B		A
Silicone Fluids	B		B	B	B	B		A
Soap Solutions (Stearates)	C	A	A	A	A	A	A	A
Sodium Aluminate	D	C	B	A	A	A	A	A
Sodium Bicarboate	C	C	B	A	A	A	A	A
Sodium Bisulfate 10%	D	D	A	A	A	A	A	A
Sodium Borate	B	C	B	A	A	A	A	A
Sodium Carbonate (Soda Ash)	D	B	A	A	A	A	A	A
Sodium Chloride	D	C	B	A	A	B	B	A
Sodium Chronate	D	B	A	A	A	A	A	A
Sodium Cyanide	D	C	B	A	D	A	A	A
Sodium Hydroxide 20% Cold	D	A	A	B	B	A	A	A
Sodium Hydroxide 20% Hot	D	B	A	B	C	B	B	A
Sodium Hydroxide 50% Cold	D	A	A	B	C	A	A	A
Sodium Hydroxide 50% Hot	D	B	A	B	C	B	B	A
Sodium Hydroxide70% Cold	D	C	A	B	C	A	A	A
Sodium Hydroxide 70% Hot	D	C	B	C	C	B	B	A
Sodium Metaphosphate	D	D	A	A	B	B	B	A
Sodium Nitrate	A	B	A	B	D	A	A	A
Sodium Peroxide	C	C	A	B	A	A	A	A
Sodium Phosphate	D	C	A	B	A	A	A	A
Sodium Phosphate Di-basic	D	C	B	A	A	A	A	A
Sodium Phosphate Tri-basic	B	B	A	A	A	A	A	A
Sodium Silicate	D	B	B	A	A	A	A	A
Sodium Sulfate	B	B	A	A	A	A	A	A
Sodium Sulfide	C	C	B	A	A	A	A	A
Sodium Thiosulfate	B	C	A	B	A	A	A	A
Stearic Acid	A	C	B	A	A	B	B	A
Stoddard's Solvent	A	A	A	A	A	D	D	A
Styrene	A	A	A	D	B	D	D	A
Sulfate, Liquors	C	C	B	C	B	B	B	A
Sulfuric Acid 0 to 77%	D	D	B	D	A	C	C	A
Sulfuric Acid 100%	D	C	A	D	B	D	D	A
Sulfurous Acid	C	D	B	C	A	C	C	A
Tall Oil	C	B	B	B	A	D	D	A
Tar & Tar Oils	B	B	A	B	A	D	D	A
Tartaric Acid	B	D	A	B	A	C	C	A
Toluol (Toluene) (Methyl Benzene)	A	A	A	D	B	D	D	A
Trichlorethylene	A	B	B	C	B	D	D	A
Varnish	A	C	A	C	B	D	D	A
Vinyl Chloride	D	A	D	B	C	C	A	A
Water, Distilled	A	D	A	A	C	A	A	A
Water, Fresh	A	C	A	A	C	A	A	A
Water, Sea	C	D	A	A	C	A	A	A
Xylene (Zylol), Dry	A	B	A	D	B	D	D	A

All ratings are based on media at room temperature unless otherwise specified. This chart is a guide. Please be advised that in any given case many factors such as solution, concentration, temperature, degree of agitation and presence of impurities influence the rate of corrosion. The information contained herein is general in nature and while drawn from sources deemed to be reliable and presumed accurate, is not guaranteed in any way by OILCO. Any application requires the use of qualified experts and subject to limitations normally present.

General Sales Warranty

- All OILCO products are warrantied free from defects in material and workmanship under normal use and service for a period of twelve months from the date of manufacture.
- The warranty set forth herein shall be the exclusive warranty made by OILCO and in lieu of all other warranties, expressed or implied, (whether written or oral), including but not limited to any implied warranty of merchantability or fitness for any particular purpose.
- OILCO's liability under this warranty is limited to, at OILCO's option, the repair or replacement of that part which proves to be defective within twelve months of date of manufacture. OILCO Corp. is not responsible for claims of damage due to improper installation or maintenance, corrosive fluids, or use of a product for a purpose other than it was specifically designed for.
- OILCO Corp. shall have no liability or be required to fulfill any obligation under this warranty unless the original purchaser permits OILCO to inspect the item to determine whether the claimed defect is covered by this warranty and returns the claimed defective item to OILCO's factory with all shipping charges prepaid.
- Under no circumstances shall OILCO Corp. be liable for any consequential, special, or contingent damages or expenses, or any other charges beyond the invoice value of the defective items. The remedies set forth herein shall be the exclusive remedies available to the user and are in lieu of all other remedies.

Notes

1. Agreement. These *Terms and Conditions,* together with any information or documents incorporated in by reference or attached to the formal sales order, contain the entire and exclusive agreement ("Agreement") between OILCO and its Customer and supersedes any other understandings or agreements, verbal or otherwise, except as expressly set forth here. By receipt of goods and/or services, or by performing hereunder, Customer agrees to the exclusive application of these *Terms and Conditions*, although its agreement to such *Terms and Conditions* is not limited to the foregoing methods. Notwithstanding anything in foregoing to the contrary, if Customer has heretofore made OILCO an offer with respect to any goods and/or services ("Goods") to be provided hereunder, this agreement shall not operate as an acceptance of the Customer's offer, but shall be deemed a counteroffer. OILCO expressly limits and make conditional any acceptance by Customer, regardless of its form or substance, of an offer to these *Terms and Conditions*. Reference to any form or communication of Customer, including but not limited to OILCO noting Customer's purchase order number shall not be deemed to be an acceptance of any terms and conditions therein, and any different or additional terms or conditions in any proposal, acknowledgement form or any other document of the Customer are hereby objected to and superseded in their entirety by these *Terms and Conditions.*

2. Law. This Agreement shall be governed by and interpreted in accordance with the substantive (and not conflicts) laws of the State of NJ, USA. and shall not be governed by the provisions of the 1980 U.N. Conventions on Contracts for the International Sale of Goods or the related Convention on the Limitation Period in the International Sale of Goods. Other than for collection or equitable actions against Customer, any cause of action arising hereunder or related in any way hereto shall be brought only in the federal or state courts in or nearest Trenton, NJ and Customer hereby irrevocably submits to the jurisdiction of such courts. Any action arising out of or related to this Agreement against OILCO must be commenced within (1) year from the date the right, claim, demand or cause of action shall first occur, or be barred forever.

3. Cancellations. In the event an order is cancelled after it has been accepted, a cancellation charge based on the percentage of work performed by OILCO will be assessed. The minimum cancellation charge for any cancelled order is 20% of the net price. All cancellation requests must be submitted in writing and are at the discretion of OILCO.

4. Product Designs. Product designs are subject to change in OILCO's sole discretion without notice to Customer.

5. Published Prices and Terms. The published prices for all OILCO products are quoted in US dollars and are subject to change without notice. OILCO reserves the option to invoice at its prices in effect at the time of shipment. All prices and amounts due hereunder exclude all US and foreign federal, state, local, municipal or other sales, excise, use, value-added, stamp, property or other taxes and fees and all export or import fees, customs duties, tariffs or consular fees, now in force or enacted in the future. All such costs, duties, tariffs, taxes and fees shall be paid by Customer unless Customer provides a certificate of exemption or similar document exempting a payment from an applicable tax. If any government or body or similar authority determines that OILCO is liable for any such costs, duties, tariffs, taxes and fees, then the Customer shall promptly reimburse OILCO for any such liabilities paid by OILCO. Prices are F.O.B. Monmouth Jct., NJ. Minimum total purchase order amount for each order is $100.00 Net, F.O.B. factory. Orders for less that $100.00 will only be accepted with payment in advance, and/or at the full discretion of OILCO. Special quotations may be obtained from OILCO for products not covered by published prices. Such item quotations are firm for 30 days after the date of the quotation, unless otherwise indicated. Typographical errors subject to correction.

6. Payment Terms. All shipments are made with terms of the net 30 days from the date of invoice payable in US dollars. An account with is delinquent may be subject to a finance charge of 1.5% per month or the maximum allowable by law on past due invoices. If, during the period of performance of an order, the financial condition of the Customer is determined by OILCO not to justify the terms of payment specified, OILCO may demand full or partial payment in advance before proceeding with the work, or satisfactory security or guarantees that invoices will be promptly paid when due, or, at its option without prejudice to other lawful remedies, OILCO may defer delivery or cancel this contract. If Customer defaults in any payment when due, or in the event any voluntary or involuntary bankruptcy or insolvency proceedings involving Customer are initiated by or against Customer, then the whole contract price shall be immediately become due and payable on demand, or OILCO, at its option without prejudice to its other lawful remedies, may defer, deliver or cancel this contract.

7. Delivery and Title. OILCO attempts to ship all orders as promptly and efficiently as possible. However, orders are accepted with the express understanding that OILCO will not be liable for any losses or damages resulting from any delays in shipment or delivery due to any cause whatsoever. OILCO reserves the right to make delivery in installments, unless otherwise expressly stipulated in the formal sales order; and all such installments, when separately invoiced, shall be paid for when due per invoice, without regard to subsequent deliveries. Delay in delivery of nay installment shall not relieve Customer of its obligations to accept remaining deliveries. OILCO reserves the right to charge for an expediting fee where special delivery circumstances might apply. Title to the Goods, and all accessories to or products or proceeds of the Goods, shall remain with OILCO until payment in full of the purchase price and of other amounts owing by Customer. To the extent legal title to the Goods shall be deemed by law to pass to Customer at the time of delivery and prior to performance of all of Customer's obligations hereunder, equitable title shall remain in OILCO until payment in full of the purchase price. Customer shall grant, and by acceptance of the Goods shall be deemed to have granted, to OILCO, at first security, purchase money security, interest in all Goods to secure payment of the purchase price and other amounts owing by Customer and performance of all Customer's obligations hereunder. Customer shall permit OILCO to file this Agreement or financing statement(s) pursuant to the applicable Uniform Commercial Code or other applicable laws to evidence and/or perfect OILCO's security interest in the Goods. On request, Customer shall execute any and all documents and agreements in this regard and assist OILCO in any filing thereof. OILCO may reclaim any goods delivered to Customer or in transit if Customer shall fail to make payments when due.

8. Shipment and Risk of Loss. All shipments (to established OILCO customers) are F.O.B. Monmouth Jct. Full freight is allowed on surface transportation within the continental US for orders of $2000.00 net or more. This allowance only pertains to those products deemed as 'standard product line' and not oversized. Any orders not meeting OILCO's freight allowed policy will ship collect or prepaid and added to the invoice. OILCO reserves the right to select freight routing. All freight claims and tracers are Customer's responsibility. During shipment and during any return shipment to OILCO, Customer shall bear all risk of loss thereto, and carry adequate insurance, for any and all loss, damage or destruction.

9. Shortages. Claims for shortages in shipment and errors in freight charges must be reported to OILCO within 15 days of the invoice date.

10. Instructions and Partial Lists. Where needed, one copy of the OILCO standard instructions and parts list is packaged and shipped with each product. When special instructions or parts lists are required with complete specifications must be submitted to the OILCO Sales Department for quotation.

11. Factory Inspection and Tests. Each OILCO product is required to pass standard factory inspections and tests prior to shipment. When certified tests are required, OILCO will test equipment performance under simulated conditions agreed upon with the customer (or those practices determined as standard operating tolerances by factory, if none such conditions are specifically required). All special factory inspections, certified performance tests, or other similar tests must be submitted to the OILCO Sales Department for quotation.

12. Product Return.

12.1 Return Procedure. Customer must obtain authorization from the OILCO Sales Department prior to the return of items to the factory by calling and obtaining a Return of Goods Authorization (RGA). Customer must provide the reason of the return, invoice date, and invoice number of item to be returned. All returns must be shipped freight prepaid. The RGA number must be marked on the outside of the box to be returned. Failure to have this number on the box will result in the item being returned to sender.

12.2 Returns due to Customer Error. OILCO allows 30 days from the date of receipt to return standard items purchased in error. The return will be subject to a minimum handling and restocking fee to be determined by OILCO Sales Department subject to a $100.00 minimum plus any charge for necessary reconditioning of the item. Returns after 30 days must be approved in advance by the OILCO Sales Department.

12.3 Returned due to OILCO error. All requests to return items due to errors by OILCO must be made within 30 days of the receipt date. Upon receipt and acceptance of the items by OILCO, full credit will be issued.

12.4 Returns under warranty. Goods returned under warranty are inspected at the factory to determine the nature of the defect. If after such inspection OILCO confirms that a defect exists that is covered by the applicable warranty and that such has not become invalid, OILCO will repair or replace the items subject to the conditions set forth in this Agreement. If OILCO determines during the inspection that the applicable warranty has become invalid, Customer will be contacted for the returned items salvage instructions. If salvage instructions are not received within 30 days after notice has been given, the returned items will be scrapped.

12.5 Specialized Goods. Custom and assembled loading arms, special swivel joints and other special products are made to order and not returnable. Parts, repair kits, and seal replacement kits will not be accepted for return.

13. Warranties.

13.1 Standard Warranty. Except as otherwise set forth in this Agreement and subjected to the terms and conditions herein, OILCO warrants that all items will meet the specifications from the products as published by OILCO for a period of 12 months after shipment from the factory. Subject to the terms and conditions set forth in this Agreement, if within the warranty period such items shall be proved to OILCO's satisfaction to be non-conforming, OILCO will either, its sole discretion, repair or replace the defective product without charge. Customer must notify OILCO in writing within the warranty period of any such alleged defects. OILCO, in it sole discretion, may require Customer to return the allegedly defective parts or items to its factory for verification of any claim.

13.2 Limitations of Warranties. The limited warranties contained in this Section 13 shall be valid and remain in effect only if: (a) the items are used, maintained, installed, stored and repaired by Customer as required by all applicable documentation; (b) Customer has paid OILCO all sums due hereunder; (c) Customer has not in any way modified the items; (d) the claim is unrelated to normal wear and tear, corrosion or erosion, or to any good normally consumed in operation or that has a normal life inherently shorted that the applicable warranty period; (e) the claim is unrelated to the failure by Customer to follow the most current instructions issued by OILCO with respect to the proper use of the items; (f) the claim is unrelated to Customer's provided materials, assembly, specification(s) or design(s) or to the negligence or act of Customer or any third party; (g) there has been no operation or use of the items under conditions more severe that those for which the items were specified; or (h) the claim is unrelated to force majeure.

14. Exclusion of Consequential Damages and Disclaimer of Liability. The foregoing sections 12.4 and 13 shall provide Customer's sole and exclusive remedy under this Agreement for any claim whatsoever. The exclusive remedy shall not be deemed to have failed its essential purpose so long as OILCO is willing and able to repair or replace non-conforming items within a reasonable time after Customer proved to OILCO that a non-conformity is involved. Except as warranted in Section 13, the *goods are sold hereunder as is, and no warranty of any kind, express, implied or statutory, whether in relation to merchantability, hidden defects, fitness for particular purpose, course of performance, course of dealing, usage of trade, non-infringement or otherwise is given by OILCO to Customer or any other party. OILCO shall not under any circumstance be responsible for any loss or damage, indirect, special, ordinary, exemplary, consequential, or otherwise (including, but not limited to, loss of revenue, profit or use or cost of capital or of substitute use or performance), arising out of the transactions contemplated hereunder. Under no circumstances shall OILCO's total liability of all kinds arising out of or related to this Agreement (including, but not limited to any warranty claims hereunder), regardless of the forum and regardless of whether any action or claim is based on contract, tort, strict liability or otherwise, exceed the total amount paid by Customer to OILCO hereunder (determined as of the date of any final judgment in such action).* The warranties set forth in Section 13 do not cover any expense incurred in repairs or alteration made outside the OILCO factory without prior authorization, nor do they cover in any way the performance of equipment, which has been revised or altered by others. Customer is wholly responsible for establishing the suitability of the product for his or her particular application and operating conditions, which do not exceed product limitations.

15. Force Majeure. Other than a party's payment obligations under this contract, neither party shall be liable for any default or delay in delivery due to causes beyond its reasonable control, such as acts of God, acts of the other party that cause delay, acts of civil or military authority, fires, strikes, floods, delays in transportation, government regulation (whether valid or not), or inability due to causes beyond the control of Seller to obtain necessary engineering talent, labor or materials. In the event of such delay, the delivery shall be extended for a period equal to the time lost thereby.

16. Safety and Indemnification. Customer in its use of the product shall comply with all statutes, laws, ordinances, regulations and/or guidelines of any applicable jurisdiction or agency, including without limitation, the Occupational Safety and Health Act of 1970, as amended. Customer shall ensure that its personnel are, at all times, trained in the proper use and/or operation of items and that the items are in accordance with applicable manuals, documentation and instructions. Customer shall indemnify, defend and hold OILCO harmless from and against all claims, damages, losses, judgments, fees, expenses and costs, including attorney's fees, as incurred, arising out of or resulting from Customer's failure to comply with or in any way related to its breach of this Agreement and or to the matters contained in Sections, 3, 5, 7, 8 and 18.6.

17. Severability. If any provision or portion thereof of this Agreement is held by a court of competent jurisdiction to be invalid, void or unenforceable, such illegality or unenforceability shall not effect the validity and enforceability of any legal and enforceable provisions hereof. *It is expressly understood and agreed that each and every provision of this Agreement that provides for a limitation of liability, disclaimer of warranties or exclusion of damages, is intended by the parties to be severable and independent of any other provision and to be enforced as such.* The remaining provisions shall be construed as if such illegal and unenforceable provision or provisions had not been inserted herein, unless such illegality or unenforceability shall destroy the underlying business purpose of the Agreement. Customer waives any governmental immunity, if applicable, to any and all causes of action.

18. Miscellaneous.

18.1 None of the provisions of this Agreement shall be deemed to have been waived by any act of or acquiescence on the part of OILCO, its agents, subcontractors, or employees, or by any subsequent Customer correspondence, purchase order or the like, but only by an instrument in writing signed by an authorized representative of OILCO. No waiver by OILCO of any provisions of this Agreement shall constitute a waiver of any other provision or of the same provision on another occasion.

18.2 It is expressly declared that this Agreement and the relationship between the parties hereby established do not constitute a partnership, joint venture or agency arrangement between them.

18.3 This Agreement shall be binding upon and inure to the benefit if the parties hereto and their respective successors and assigns. Customer may not assign its rights or obligations under this Agreement in any way without written consent of OILCO. OILCO may use subcontractors as it deems necessary.

18.4 This Agreement may be amended only in writing signed by each of the parties hereto.

18.5 All notices required to be given hereunder shall be in writing. Notices shall be considered delivered and effective upon receipt when electronically with proof of transmission or by registered or certified mail postage pre-paid, return receipt requested, addressed to the parties. Either party, upon written notice to the other, may change the address to which future notices shall be sent.

18.6 Buyer shall not, directly or indirectly, export or transmit any items covered by this Agreement to any country to which export or transmission is restricted by applicable regulations or statutes of the United States or any agency thereof, without the prior written consent of the US Department of Commerce, Washington D.C. 20230 and of any other required governmental agency. Customer covenants that that items are not intended for any nuclear use or chemical or biological weapons production.

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