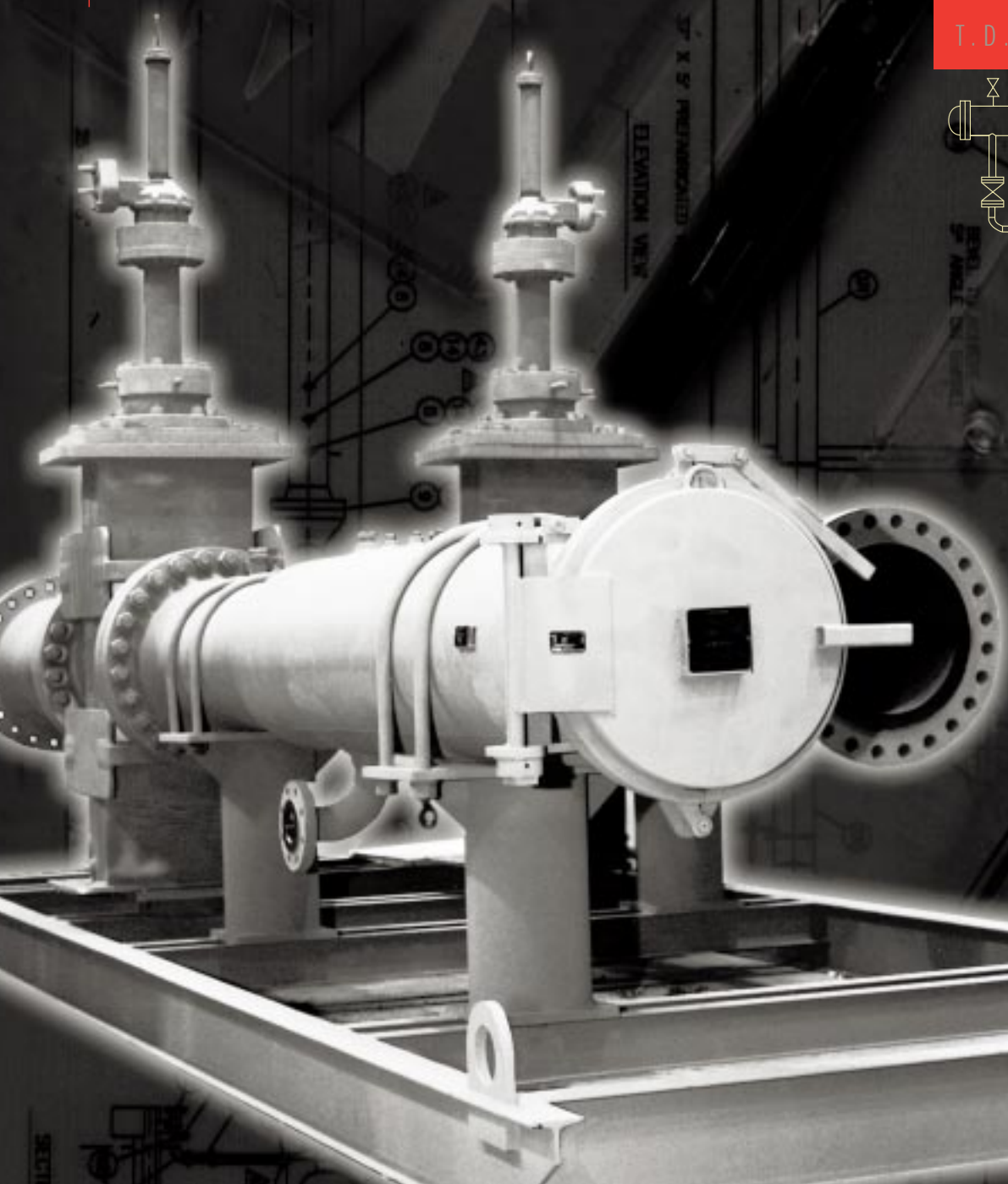
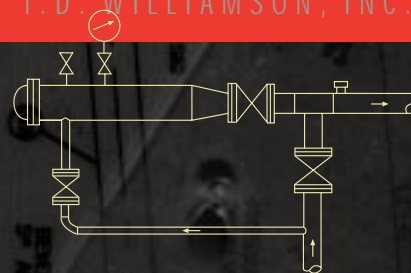


# *Complete* PIGGING SYSTEMS

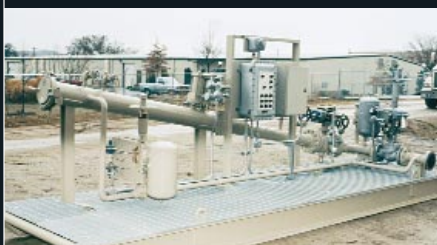


T.D. WILLIAMSON, INC.



Today, more and more pipeline operators are realizing the value of maintaining a regular pigging program. Batching products, displacing liquids from the line or continuously cleaning a line to achieve maximum flow efficiency and to reduce corrosion are some of the benefits.

Whether your operation requires cleaning, batching, displacement or special applications, the success of your pigging program depends a great deal on the system you install to launch and receive the pigs or spheres.



TDW designs and builds complete, standard launching and receiving systems that offer you many important advantages in the installation and maintenance of a successful pigging operation.

Our standard launching and receiving systems are complete packages. Valves, piping and handling equipment are already assembled and tested, ready to be installed in the field. That means you don't waste time laboring over designs, engineering specs, quotes from multiple sources or fabricating and assembling component parts. TDW has already done it for you!

Each unit is skid-mounted with all the outlets properly sized and located. All you have to do is provide a site to set it, tie in the main line and the bypass line, and you have a working system.\*

TDW launching and receiving equipment functions efficiently and easily as a complete working unit to minimize manpower and time requirements.

More than sixty years of designing and manufacturing pipeline pigs and supplying related pigging services have prepared TDW well for designing and building launching and

receiving systems. Our experience has taught us what works best, and we have incorporated it into one complete unit, ready to install and use.

This same knowledge and experience are also available to you for designing and building systems that are custom made for your particular application. And there are several options available on our standard units as well.

We welcome the opportunity to tell you more about our complete, standard launching and receiving systems for pipeline pigging.

\*Note: End thrust loads should be integral to the design of the pipeline and not to the launching and receiving units.



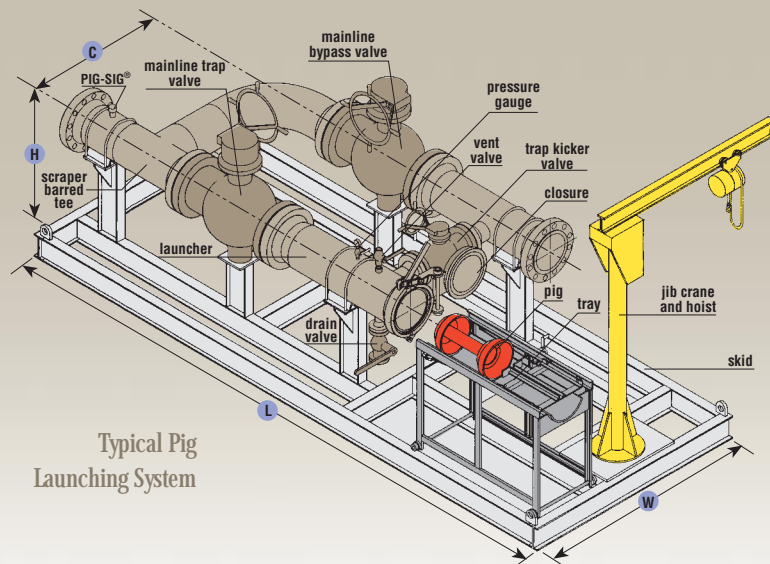
COMPLETE  
LAUNCHING  
& RECEIVING  
UNITS READY  
TO INSTALL AND USE

*Standard  
and custom designs*



# PIG LAUNCHING & RECEIVING

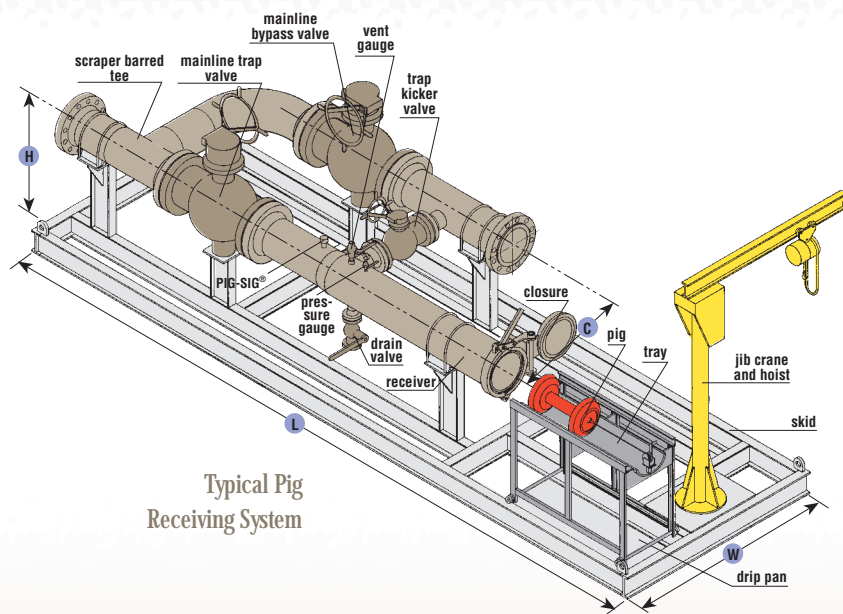
# Systems



Typical Pig Launching System

## Pig Launching

size	C	H	L	W	approx. weight lbs.
12" x 16"	3'8"	3'0"	21'10"	6'0"	12950
14" x 18"	3'10"	3'2"	22'4"	6'4"	14000
16" x 20"	4'0"	3'2"	23'8"	6'8"	18200
20" x 24"	5'0"	5'2"	26'7"	8'4"	27500
24" x 28"	5'11"	5'6"	31'0"	9'6"	35550
30" x 34"	6'11"	5'10"	38'4"	11'4"	52500
36" x 40"	7'8"	6'5"	45'8"	12'4"	76300
40" x 44"	8'0"	7'7"	50'1"	13'0"	107660



Typical Pig Receiving System

## Pig Receiving

size	C	H	L	W	approx. weight lbs.
12" x 16"	3'8"	3'0"	26'11"	6'0"	13230
14" x 18"	3'10"	3'2"	27'4"	6'4"	15450
16" x 20"	4'0"	3'2"	27'6"	6'8"	20100
20" x 24"	5'0"	5'2"	31'3"	8'5"	26700
24" x 28"	5'11"	5'6"	36'0"	9'6"	37700
30" x 34"	6'11"	5'10"	45'10"	11'4"	56340
36" x 40"	7'8"	6'5"	55'7"	12'4"	82200
40" x 44"	8'0"	7'7"	61'6"	13'0"	115350

## Typical Specifications

### Pressure Testing

Each TDW standard pigging system is pressure-tested as a complete unit per code.

### Welding Codes

TDW offers welding per API 1104 Code or ASME Section IX. Weld procedure and qualifications are available upon request.

### Welding Inspection

Standard units are 100% weld inspected on pressure-containing welds. All circumferential welds

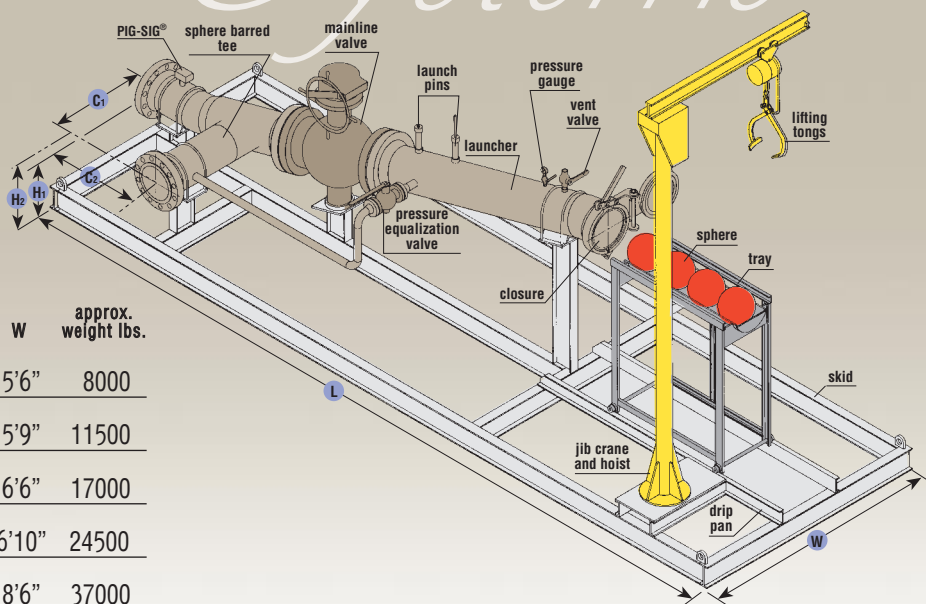
are radiographically inspected. TDW maintains a highly trained staff of quality control personnel so that our customers receive the best constructed equipment available.

### Materials of Construction

Readily available pressure-vessel carbon steel materials are used in the fabrication of all TDW standard launching and receiving units.

# SPHERE LAUNCHING & RECEIVING Systems

Typical Sphere  
Launching System



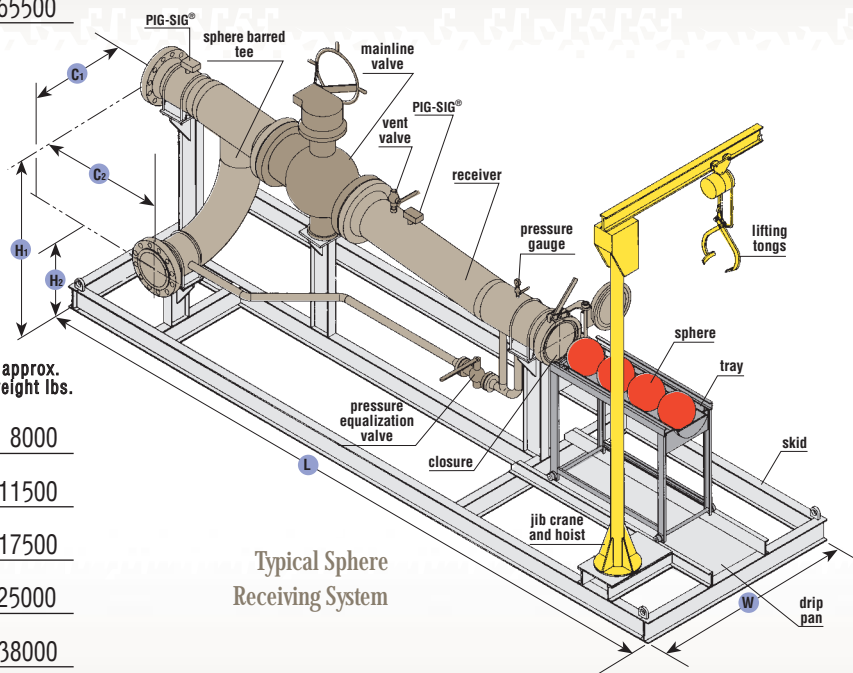
Sphere Launching

size	C1	C2	H1	H2	L	W	approx. weight lbs.
12" x 14"	3'6"	3'8"	2'0"	2'2"	22'10"	5'6"	8000
16" x 18"	3'9"	4'2"	2'6"	2'8"	27'8"	5'9"	11500
20" x 22"	4'0"	3'8"	2'10"	2'11"	31'4"	6'6"	17000
24" x 26"	4'4"	4'2"	3'6"	3'8"	36'0"	6'10"	24500
30" x 32"	4'8"	4'7"	4'0"	4'2"	42'9"	8'6"	37000
36" x 40"	5'3"	5'11"	4'9"	5'0"	51'3"	9'8"	65500

Sphere Receiving

size	C1	C2	H1	H2	L	W	approx. weight lbs.
12" x 14"	3'0"	3'8"	4'1"	1'8"	22'10"	5'1"	8000
16" x 18"	3'7"	4'2"	5'11"	1'11"	27'8"	5'8"	11500
20" x 22"	4'4"	3'8"	6'3"	2'4"	31'4"	6'10"	17500
24" x 26"	5'0"	4'2"	7'4"	2'9"	36'0"	7'7"	25000
30" x 32"	5'11"	4'7"	8'10"	3'0"	42'9"	9'9"	38000
36" x 40"	7'0"	5'11"	10'6"	3'7"	51'3"	11'5"	67000

Typical Sphere  
Receiving System



These materials include:

Pipe: A-106, API-5L, API-5LX  
Fittings: A-234 WPB  
Flanges: A-105  
Forgings: A-105  
Plate: A-516, A-515

or the equivalent materials which meet European standards such as B.S., DIN or AFNOR.

*OPTION: Systems can be a complete weld-in system rather than flanged. Special materials can be provided to meet your specifications.*

**Design Code**

The TDW standard system is designed and fabricated to ASME B31.4 Code for liquid pipelines or B31.8 Code for gas pipelines.

*OPTIONS: Design Codes B31.3 or ASME.*

**Finish Specifications**

Each unit is sandblasted and prime-coated as a standard procedure.

*OPTION: Special primers can be specified by the customer.*

**Handling Equipment**

Pig or sphere handling equipment is recommended for sizes 20" and larger.

# STANDARD LAUNCHING &

The TDW standard system consists of all the components you need to launch and receive pigs or spheres:

- launcher
- receiver
- closure (4" through 14" threaded, 16" and larger clamp ring)

- PIG-SIG® (manual/visual) Pig Passage Indicator)
- pig handling tray (for 20" and larger)
- jib crane and hoist (for 20" and larger)
- lifting tongs for 20" and larger spheres
- manual launch pins for sphere launchers only



## Pig Launchers and Receivers

The standard TDW pig trap designs are capable of launching one and receiving two standard cleaning or displacement pigs. The standard designs include all outlets necessary to successfully launch and receive pigs. These outlets consist of a kick-out or bypass line that is one-third the pipeline size, gauge port, vent port and drain line. The oversize barrels are sized large enough for clearance required to easily insert cleaning pigs with cleaning elements that extend beyond the pig cup diameter.

*OPTION: TDW offers extended barrel lengths for the extra long inspection pigs.*

## Sphere Launchers and Receivers

TDW standard sphere traps for gas service are designed to handle seven spheres. Their design utilizes an oversize launching and receiving mainline trap valve that is equivalent to the barrel size. The design eliminates the requirement for the mainline bypass valve and piping. Spheres are easily launched simply by raising and lowering launch pins, without the need to open and close mainline valves.

*OPTION: Automated sphere launch pins are also available.*



## Closures

The TDW closure gives you simplicity and reliability in two basic designs: threaded, 4-inch through 14-inch sizes, and clamp-ring, sizes 16-inch and larger.

TDW closures give you a reliable seal. We use a large cross-sectional diameter O-ring, which means the seal is not likely to be affected by warpage due to welding or by sand or dirt particles. The O-ring is installed in a protected area in the closure hub.

All TDW closures are equipped with a pressure warning lock which alerts the operator to the existence of internal pressure.

The clamp-ring closure offers a practical way of opening and closing large-diameter closures. Add our innovative O-ring design, and you have a closure door that one person can quickly and easily operate.

*OPTION: 4" - 14" sizes available in clamp-ring closures.*



## Modular Skid-Mounted Units

The TDW launching and receiving units are skid-mounted to facilitate easy handling and installation. A concrete foundation is all that is necessary to set the units in place.\*

The skid assembly is fabricated from structural steel featuring lifting lugs at the corners for handling and a drip pan beneath the closure door to catch liquid and pipeline debris.

*OPTION: Skid may be omitted. Units can be designed and built to install bypass piping below ground or above ground piers.*

## Jib Crane and Hoist

Larger units may be equipped with a jib crane and manual hoist assembly. This assembly is positioned on the unit to easily handle pigs or spheres for loading or unloading operations. The hoist assembly for spheres is equipped with tongs to make it easy to handle spheres without risking damage or dropping. The jib cranes and hoist are offered in one- to two-ton capacities, depending on size.

*OPTION: The jib crane and hoist are recommended on sizes 20" and larger.*



\*Note: End thrust loads should be integral to the design of the pipeline and not to the launching and receiving units.

# RECEIVING COMPONENTS

- bypass piping
  - valves (mainline trap valve, mainline bypass valve, trap kicker valve on launchers, trap bypass valve on receivers, valve with pressure gauge, vent valve, drain valve for liquid service, pressure equalization valves for sphere launchers and receivers)
  - skid assembly with drip pan
- All these components are assembled, tested and mounted on skid units for the standard launching and receiving systems. Options that are available with these components are included in the following descriptions.

## Valves

The mainline trap valve attached directly to the launcher or receiver is a full opening/full bore piggable valve. The mainline bypass valve is nominal line size. Valves 8" and larger are equipped with gear operators. Unless otherwise specified by the customer, TDW will select the valve manufacturer. The valves are flanged and pressure-tested with the system prior to the shipment.

*OPTION: Customer supplies valves. Valve actuators and controls are also optional features.*

## Mainline Bypass Tees

All mainline bypass tees are barred to prevent pig damage when it is necessary for the pigs to pass the tees. The bars are spaced to prevent the pig's cleaning elements from becoming damaged. The u-shaped bars are welded to the neck of the tee, not to the outlet radius. This prevents guide bar breakage after the line has been in service for an extended time.

## PIG-SIG® Indicators

All TDW launching and receiving systems include the TDW manual/visual PIG-SIG® IV Scraper Passage Indicator. The indicator is properly located to signal a pig's position. TDW PIG-SIG Indicators are easily installed, removed or replaced without pipeline shutdown.

*OPTIONS: Electrical, manual/electrical, extended, special material or any combination of these options are available.*

## External Pig Trays

All TDW pigging systems are designed so that one person can load and unload pipeline pigs. To help satisfy this capability, TDW utilizes an external pig tray. These trays are equipped with a push-pull mechanism to pull the pig from the receiver barrel or to push the pig into the launcher barrel. In-line launchers and receivers require only one external tray since the tray can roll on the track between the launcher and the receiver.

*OPTION: Internal trays are available at the customer's request.*

## Automated Control Packages

TDW can provide a complete line of automated packages to simplify the launching and receiving operation. Automated valve operators, electrical pig indicators, sphere launch pins, programmable, automated control panels, pressure and temperature sensors, and pressure-relief systems are just some of the components offered. Control packages are available by using either pneumatic, electrical, hydraulic or combinations, as power sources.

## Pigs and Spheres

TDW is the pioneer developer and the leading manufacturer of pipeline pigs: cleaning pigs, bidirectional pigs, batching pigs, displacement pigs, foam pigs, spherical pigs, magnet pigs, and drying pigs.

Consult the factory for selecting the correct pig for your application.





# LIQUID SERVICE

## Operating sequence for launching and receiving **PIGS**

The operating sequence described below is general information for TDW standard systems. It is not intended nor should it be used for training pigging systems operators.

### LAUNCHING

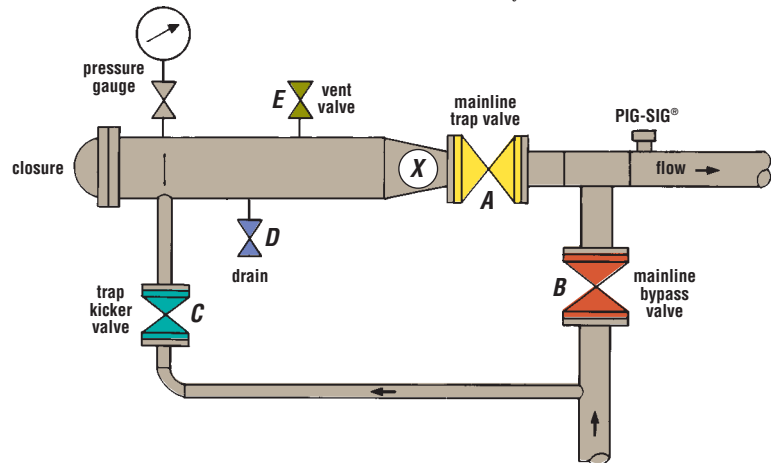
#### Starting Condition:

Trap is pressurized and full of liquid. Valves **A**, **B** and **C** are open. Valves **D** and **E** are closed.

1. Close Valves **A** and **C**.
2. Drain the launching trap by opening drain Valve **D** and allow air to displace the liquid by opening vent Valve **E**.
3. When the trap is completely drained (0 psig) with Valves **E** and **D** still open, open the closure door and insert the pig so the first cap forms a tight fit in the reducer at point (X).
4. Close and secure the closure door. Close drain Valve **D** and leave vent Valve **E** open. Slowly fill the trap through Valve **C** by venting the air through Valve **E**. When filling is

completed, close vent Valve **E** to allow pressure to equalize, then close Valve **C**.

5. Open Valve **A** first and then open Valve **C**. The pig is now ready for launching.
6. Partially close Valve **B**. This will increase the flow of liquid through Valve **C** and behind the pig. Continue to close Valve **B** until the pig moves out of the trap into mainline stream as signaled by the PIG-SIG Indicator.
7. When the pig leaves the trap and enters the mainline, open Valve **B** fully.



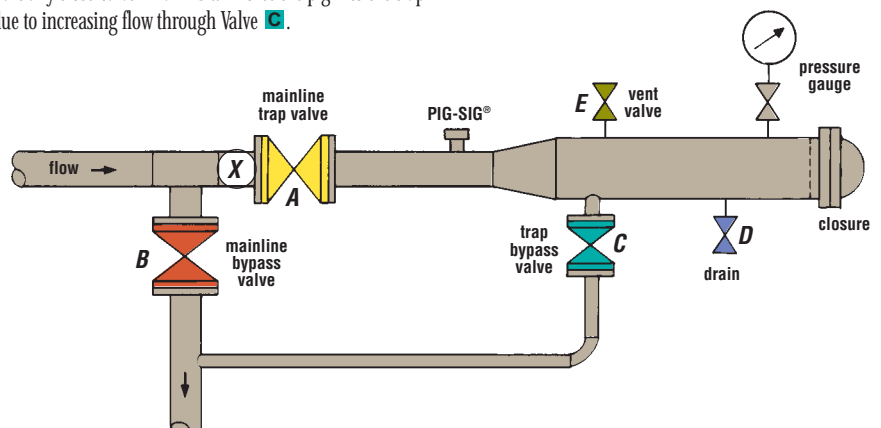
### RECEIVING

#### Starting Condition:

Trap is empty at atmospheric pressure. Valves **B**, **D** and **E** are open. Valves **A** and **C** are closed. Closure door is closed and secured.

1. Close drain Valve **D**. Slowly fill the trap by opening Valve **C** venting through Valve **E**.
2. Close vent Valve **E** to allow trap pressure to equalize through Valve **C**.
3. With Valve **C** open, open Valve **A**. Trap is now ready to receive pig.
4. When the pig arrives, it may stop between trap Valve **A** and the tee (point (X)).
5. Partially close Valve **B**. This will force the pig into the trap due to increasing flow through Valve **C**.

6. When the pig is in the trap as signaled by the PIG-SIG Indicator, open Valve **B** completely and close Valves **A** and **C**.
7. Open drain Valve **D** and vent Valve **E** and drain the trap.
8. After the trap is fully drained (0 psig) with Valves **D** and **E** still open, open the closure door and remove the pig.
9. Close and secure the closure door.





## Operating sequence for launching and receiving **PIGS**

The operating sequence described below is general information for TDW standard systems. It is not intended nor should it be used for training pigging systems operators.

### LAUNCHING

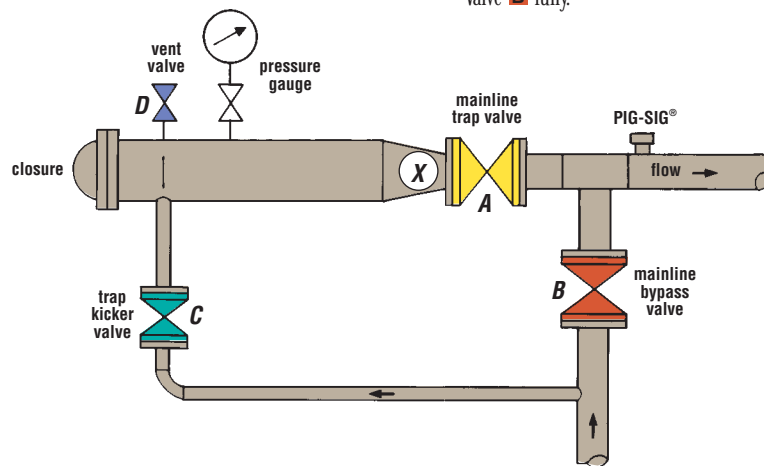
#### Starting Condition:

Trap is pressurized and full of gas. Valves **A**, **B** and **C** are open. Valve **D** is closed.

1. Close Valves **A** and **C**.
2. Open Valve **D** to vent launching trap to atmospheric pressure.
3. When the trap is completely vented (0 psig) with Valve **D** still open, open the closure door and insert the pig so the first cup forms a tight fit in the reducer (point **X**).
4. Close and secure the closure door. Purge air from trap through Valve **D** by slowly opening Valve **C**. When purge

is completed, close Valve **D** to allow pressure to equalize. Then close Valve **C**.

5. Open Valve **A**, then Valve **C**. The pig is now ready for launching.
6. Partially close Valve **B**. This will force increasing gas flow through Valve **C** and behind the pig. Continue to close Valve **B** until the pig moves out of the trap into the mainline stream as signaled by the PIG-SIG Indicator.
7. When the pig leaves the trap and enters the mainline, open Valve **B** fully.

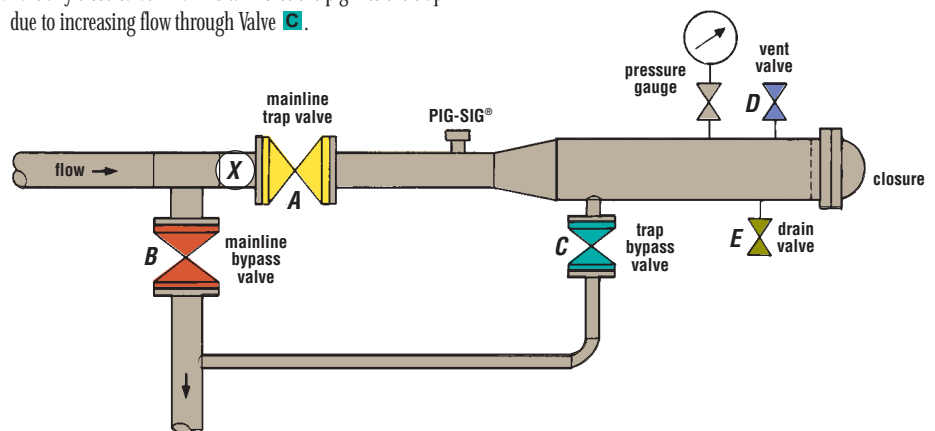


### RECEIVING

#### Starting Condition:

Trap is empty at atmospheric pressure. Valves **B**, **D** and **E** are open. Valves **A** and **C** are closed. Closure door is closed and secured.

1. To purge the trap, close Valve **E** and slowly open Valve **C**.
2. After purging, allow the trap pressure to equalize by closing Valve **D** with Valve **C** open.
3. With Valve **C** still open, open Valve **A**. The trap is now ready to receive the pig.
4. When the pig arrives, it may stop between trap Valve **A** and the tee (point **X**).
5. Partially close Valve **B**. This will force the pig into the trap due to increasing flow through Valve **C**.
6. After the pig is in the trap as signaled by the PIG-SIG Indicator, open Valve **B** and close Valves **A** and **C**.
7. Open Valves **D** and **E** and vent the trap to atmospheric pressure.
8. After the trap is vented (0 psig) and drained with Valves **D** and **E** open, open the closure door and remove the pig.
9. Close and secure the closure door.



## Operating sequence for launching and receiving **SPHERES**

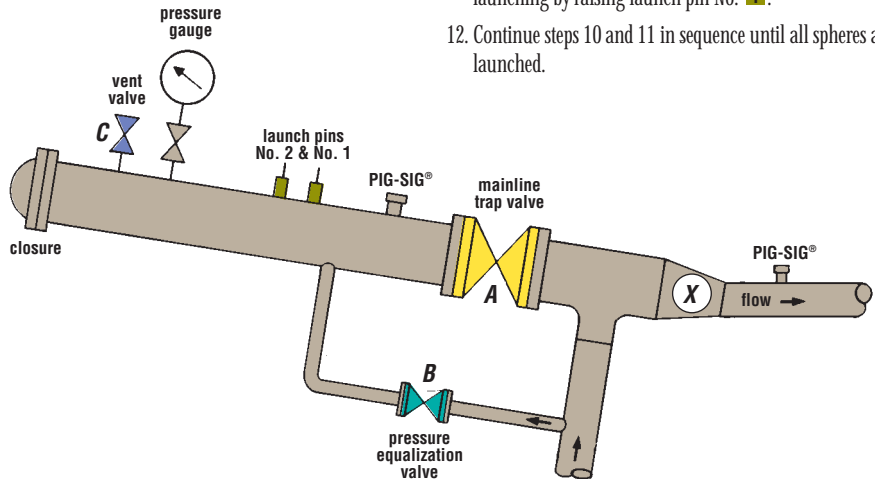
The operating sequence described below is general information for TDW standard systems. It is not intended nor should it be used for training pigging systems operators.

### LAUNCHING

#### Starting Condition:

Trap is pressurized and full of gas. Valves **A** and **B** are open. Valve **C** is closed.

1. Close Valves **A** and **B**.
2. Slowly open Valve **C** to vent trap to atmospheric pressure.
3. With vent Valve **C** still open (0 psig), open the closure door.
4. Lower launch pin No. **1** and raise launch pin No. **2**.
5. Load spheres. Lower launch pin No. **2**.
6. Close and secure the closure door.
7. With vent Valve **C** still open, slowly open Valve **B** to purge air from trap.
8. After purge is complete, close Valve **C** to allow trap pressure to equalize. Open mainline Valve **A**.
9. To launch single spheres, raise launch pin No. **1** and sphere will roll through Valve **A** and mainline tee to reducer (point **X**). At this point, sphere will pick up mainline flow and launch is complete. The PIG-SIG Indicator will signal completed launch.
10. To prepare for second launch, lower launch pin No. **1** and raise launch pin No. **2**. All spheres will advance.
11. Lower launch pin No. **2** and second sphere is ready for launching by raising launch pin No. **1**.
12. Continue steps 10 and 11 in sequence until all spheres are launched.

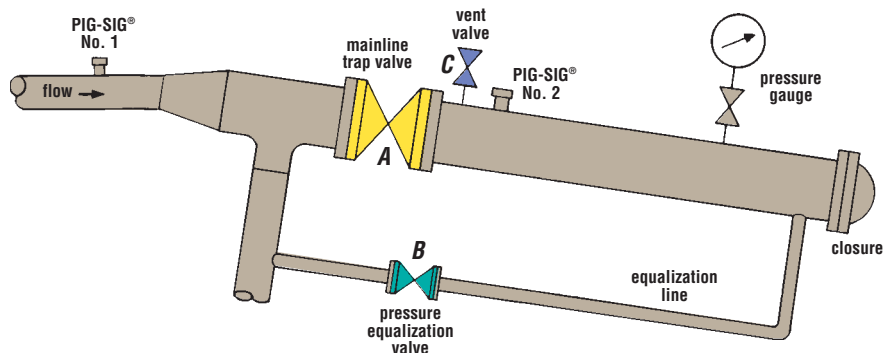


### RECEIVING

#### Starting Condition:

Trap is empty at atmospheric pressure. Valves **A** and **B** are closed. Valve **C** is open. Closure door is closed and secured.

1. To purge the trap, open Valve **B** slowly, venting through Valve **C**.
2. After purging, close Valve **C** to allow pressure to equalize.
3. Open Valve **A**. Trap is now ready to receive spheres.
4. Spheres will enter barrel through mainline Valve **A**. PIG-SIG Indicators No.1 and No.2 will verify sphere arrival.
5. After the sphere barrel is full of spheres, close mainline Valve **A**.
6. Close Valve **B**. Vent trap to atmospheric pressure by opening vent Valve **C**.
7. With vent Valve **C** open (0 psig), open closure door and allow spheres to roll out onto sphere tray.
8. Close and secure the closure door.





*The world's leading  
manufacturer of pigs, pig  
accessories and pigging  
systems*



TDW Pigging Products



T.D. Williamson (U.K.) Limited



TDW Tulsa Manufacturing Plant

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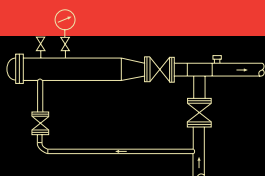
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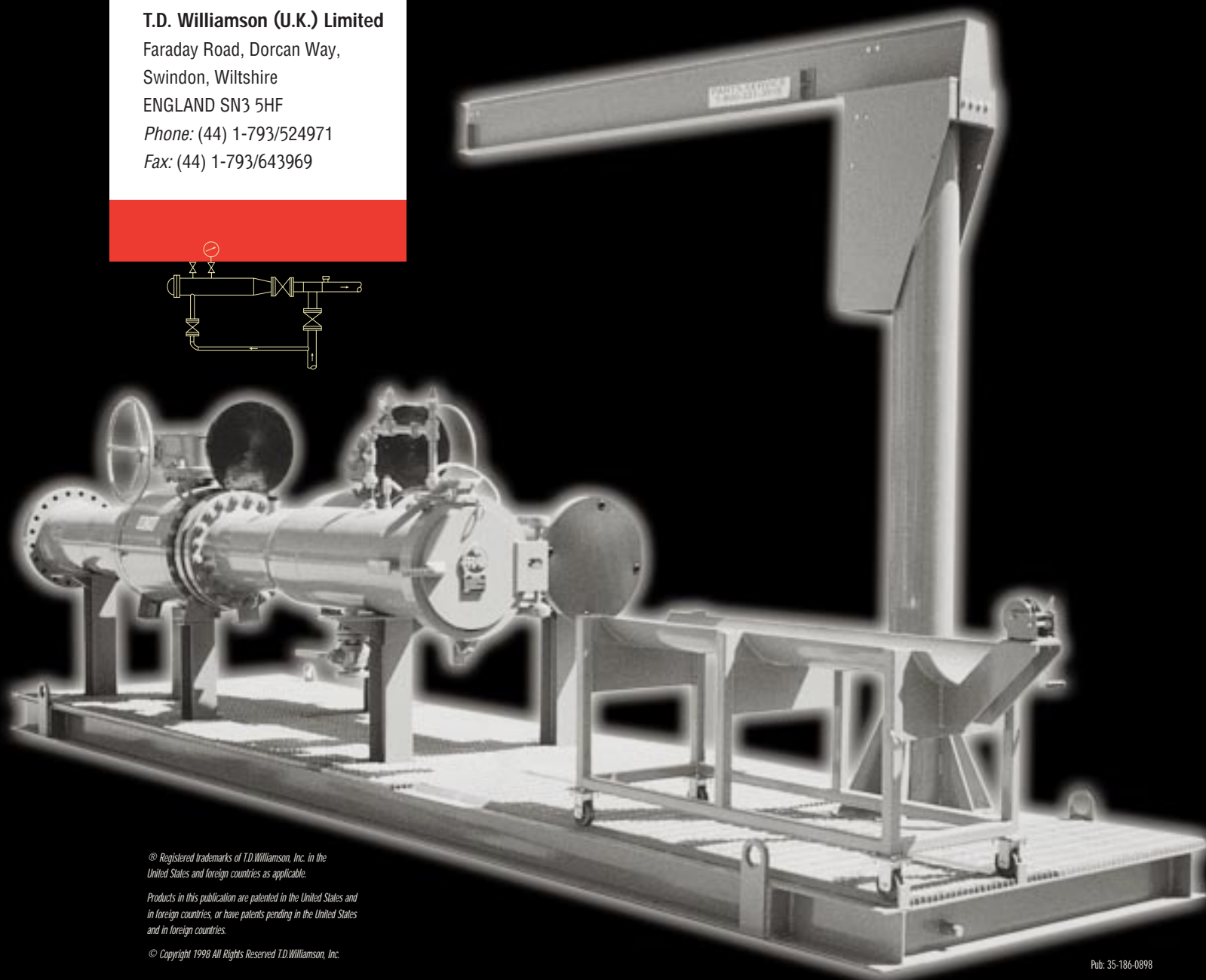
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