Wiggins Tank Vents
Automatic Refueling and Lubrication Service System

Service System

The Original - Since 1967
**WIGGINS REFUELING SYSTEM**

**DRY BREAK CONNECTION – AUTOMATIC SHUTOFF**

**HOW IT WORKS:**

The Wiggins “fast fuel” System is based on the simple concept of using a sealed vehicle tank to allow a small amount of back pressure to build and automatically shut off the nozzle. A receiver is located near the bottom of the tank. Bottom filling helps eliminate foaming which can occur during top fueling “splashing”.

The Wiggins ZZ9A1 nozzle is attached to the Receiver, the handle is turned to the “ON” position and fuel begins to fill the fuel tank at a rate up to 150 Gallons per Minute.

As fuel enters the tank, it forces the air inside the tank to exit through the Wiggins vent. When the fuel level nears the top of the tank, the “Hollow” floating balls force the third “Solid” ball to seal against the vent “Stem”, sealing the tank. As fuel continues to flow, pressure inside the tank builds until it reaches 8 to 10 PSIG. At 8 to 10 PSIG, the nozzle automatically shuts off. The nozzle can then be removed, and the next vehicle is ready to fuel!

**FAST, CLEAN, SAFE…**

**FAST** - The Wiggins fast fuel system reduces fueling time by three to five times, and gets your vehicle back into service. By reducing fueling time to only 10 minutes, when compared to a conventional nozzle fueling at a rate of 25 GMP on a tank of one thousand gallons compared to the maximum Wiggins fuel rate of 150 GPM). This means timesaving of 20 minutes each fueling or one hour of additional vehicle service each day. Thus, system payback is less than one year per vehicle!

Because the Wiggins system fills the tank from the bottom, foaming of the diesel fuel is kept to a minimum, resulting in full tank every time, reducing the time between fuel stops.

**CLEAN** - The automatic shut off feature, along with the positive seal on the tank vent assures that spills are kept to a minimum. The Dry Break feature built into each unit assures that there is no spillage when the nozzle is disconnected, even if fuel is currently flowing through the nozzle.

**SAFE** - Because fueling is performed at ground level with the Wiggins system, there is no need for personnel to climb onto equipment to fuel or service. This greatly reduces the number of accident cause by falling.
How to install the Wiggins system

Ways to mount Receivers...

There are five basic ways to mount Wiggins receivers to the fuel tank, depending on the vehicle. Examples are:

Options for system installation...

Direct Mount

Remote Mount

Ways to mount Vents...

There are three ways to mount tank vents. Example is:

It must be noted that the vent be mounted so that the alignment of the bottom of the vent stem allows for a minimum ullage of 5% to 10% of the total tank volume. By not allowing for the proper level of allege on the tank could cause the system to over fill.
WIGGINS REFUELLING NOZZLE

Completely redesigned for improved performance and maintainability

The new Wiggins Refueling Nozzle ZZ9A1 is a total redesign. Improved valves, materials, and actuating mechanisms deliver increased durability and flow performance. Perhaps the most welcome new feature, field maintainability, will keep your Wiggins Refueling Nozzles on the job site for quick and easy upkeep as needed. Lightweight, tough, and easy to care for, these nozzles are ready to keep your fleet fueled and on the go!

Aerospace composites & precision cast aluminum are at the heart of this simple design
• Our new nozzle contains fewer than half of the components of its predecessor.
• We have replaced the delicate diaphragm with a heavy duty piston seal.
• Injection molding and die casting produces superior quality to you at a lower cost.

Mates with your existing Wiggins system
• This nozzle was designed for use with your current Wiggins system. Simply change out your ZZ9A nozzle with the ZZ9A1 and you are ready to take advantage of its many improvements with no capital investment.

Field replaceable components allow you greater availability
• Field replaceable dog-latching mechanism
• Field replaceable actuating ring mechanism
• Field replaceable wiper seal
• Field replaceable carrying handle
Your Availability Will Increase with ZZ9A1

Our field replaceable items will really be Field Replaceable, not requiring any flow tanks or complicated equipment.

**KR91—Actuating Assembly Replacement Kit**

Tools Required:
- Screw driver, pliers
- Time Required: 3 min.
  (approximately)

**KR92—Latching Mechanism Replacement Kit**

Tools Required:
- Screw driver, pliers
- Time Required: 3 min.
  (approximately)

**KR93—Housing Handle Replacement Kit**

Tools Required: 1/4"
- Allen wrench,
- 1/2" wrench
- Time Required: 1 min.
  (approximately)

**Specifications**

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Flow Rate</td>
<td>35 to 150 gpm</td>
</tr>
<tr>
<td>ΔP</td>
<td>17 psi @ 125 gpm</td>
</tr>
<tr>
<td>Operating Pressure</td>
<td>25* to 125 psig</td>
</tr>
<tr>
<td>Weight</td>
<td>5.5 lbs.</td>
</tr>
</tbody>
</table>

*The system will function below 25 psig. However, you may not achieve 150 gpm.

**Compatible Wiggins Receivers**

- ZNC2A Receiver w/cap
- ZNC3 Receiver w/cap
- ZNC4 Receiver w/cap

Complete system components are described in Wiggins Service System Bulletin No. WSS-110. Please call for a free copy.

**Available from your Authorized Wiggins distributor:**
Contaminated fuels are one of the biggest challenges to diesel vehicle operation today. Dirt in the fuel injectors can keep machines out of service. The ZV-13 filtered vent assures that any air entering the fuel tank has been filtered to 100 microns, eliminating a major cause of fuel contamination.
# Wiggins Fuel Tank Vents

## ZV-10 and ZV-11 Standard Tank Vents

<table>
<thead>
<tr>
<th>Vent Model</th>
<th>Mounting Style</th>
<th>Length</th>
<th>Pressure Relief</th>
<th>Rebuild Kit Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>ZV10</td>
<td>Pipe Thread</td>
<td>9.375”</td>
<td>10.2 – 12.9 psi</td>
<td>K30285</td>
</tr>
<tr>
<td>ZV10A</td>
<td>Welded Half-Coupling</td>
<td>9.375”</td>
<td>10.2 – 12.9 psi</td>
<td>K30285</td>
</tr>
<tr>
<td>ZV10B</td>
<td>Flange/Gasket</td>
<td>9.375”</td>
<td>10.2 – 12.9 psi</td>
<td>K30285</td>
</tr>
<tr>
<td>ZV10C</td>
<td>Same as ZV10 w/ threaded outlet</td>
<td>9.500”</td>
<td>10.2 – 12.9 psi</td>
<td>K30285</td>
</tr>
<tr>
<td>ZV10F</td>
<td>Same as ZV10 w/long Stem</td>
<td>12.500”</td>
<td>10.2 – 12.9 psi</td>
<td>K30285</td>
</tr>
<tr>
<td>ZV11</td>
<td>Gas Cap Mount</td>
<td>9.312”</td>
<td>10.2 – 12.9 psi</td>
<td>K30285</td>
</tr>
<tr>
<td>ZV11A</td>
<td>Gas Cap Mount w/long Stem</td>
<td>12.500”</td>
<td>10.2 – 12.9 psi</td>
<td>K30285</td>
</tr>
<tr>
<td>ZV13</td>
<td>Vented Pipe thread</td>
<td>12.00”</td>
<td>10.4 – 11.3 psi</td>
<td>N/A</td>
</tr>
<tr>
<td>ZV13F</td>
<td>Long Stem</td>
<td>14.70”</td>
<td>10.4 – 11.3 psi</td>
<td>N/A</td>
</tr>
</tbody>
</table>
WIGGINS SERVICE SYSTEMS

WIGGINS FAST FUEL RECEIVERS

ZNC3 – BOLTED

ZNC4 - WELDED

ZNC2A STANDARD RECEIVER

NOTE: ZC-20P cap is used on ZNC3 and ZNC4.

CAUTION: The ZNC4 is shipped with the ZN2A nipple installed only finger tight. Before welding the ZNC4 receiver assembly to the tank, remove the ZN2A nipple from the threaded flange to prevent transferred heat from damaging rubber seals in the ZN2A.

NOTE: Same as ZC-20EP except lanyard cable has eyehot which is bolted to frame; used on ZN2A receiver.
WIGGINS SERVICE SYSTEM

WIGGINS SERVICE COUPLINGS

Change and fill crankcase oil, fill hydraulic reservoirs, top-off transmission fluid, fill the radiator – Wiggins offers a coupling to service every fluid on your vehicle.

Couplings can be mounted directly to equipment system, or at a remote location or central service box – reduces injuries by keep workers off the machine.

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ONC2A Crankcase Receiver With Cap

- ON2 (Receiver Only)
- OC-12E (Cap Only)

OSP2 Crankcase Nozzle With Plug

- OS2 (Nozzle Only)
- OP-12 (Plug Only)

NOTE: Mates with ON2 and ON2A Receivers.

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Transmission Receiver and Cap

- P-1804 (Receiver Only)
- P-1880 (Cap Only)

Transmission Nozzle and Plug

- C-1807 (Nozzle Only)
- P-1844 (Plug Only)

NOTE: Mates with P-1804 Receiver.

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Hydraulic Receiver and Cap

- 6005A12 (Receiver Only)
- 6008-12 (Cap Only)

Hydraulic Nozzle and Plug

- 6009B12 (Nozzle Only)
- 6009-12 (Plug Only)

NOTE: Mates with 6005A12 Receiver.
Nozzle Adapters for the ZZ9A1

Bulk Fuel Coupling

The ZS5 Bulk Transfer Nozzle is designed to mate with the ZN2 receiver. It can be used to drain a fuel tank for servicing, or to transfer fuel from one tank to another. The end fitting is the same 2-inch NPT female fitting as the ZZ9A1.
WIGGINS QUICK CONNECT FLUID COUPLINGS

The fast, safe, clean and economical way to service off-highway vehicles.

- **Dry Break** quick couplings minimize fluid loss at disconnect
- **Bulkhead mounted** for easy installation
- Fits SAE O-Ring boss for a positive seal
- Precision machined one piece **Aluminum** bodies
- **Flush face** for easy wipe down
- Integral dust plugs and caps

Imagine a complete oil change, which normally takes some 30 minutes, done in just 5! That’s the sort of efficiency the Wiggins R-Series Fluid Couplers bring to all major fluid systems on your off-highway equipment: **Coolant, Transmission Oil, Crankcase Oil and Hydraulic Oil.**

Wiggins R-Series fluid quick connect coupling designs help keep dirt and mud from contaminating your fluid systems, while minimizing fluid loss at disconnect. Group them all together and you’ve got a complete central service center...the smart way to keep vehicles on the job.
“R” Series – Continued

R-Series coupling nozzles and receivers are supplied separately. Specify by part numbers tabulated below

**NOZZLES**

- **COOLANT**
  - P/N: R11
    - 7/32”-14 NPT THD
    - 1-1/8” MAX
  - Lanyard and cap supplied with receiver. Replacement cap and lanyard available – P/N R1107

- **TRANSMISSION**
  - P/N: R13
    - 3”-14 NPT THD
    - 1-21” MAX
  - Lanyard and cap supplied with receiver. Replacement cap and lanyard available – P/N R1307

- **OIL**
  - P/N: R15
    - 3-1/4”-14 NPT THD
    - 1-5” MAX
  - Lanyard and cap supplied with receiver. Replacement cap and lanyard available – P/N R1507

- **HYDRAULIC**
  - P/N: R17
    - 1-11-1/2 NPT Thd
    - 1-75” MAX
  - Lanyard and cap supplied with receiver. Replacement cap and lanyard available – P/N R1707

**RECEIVERS**

- **COOLANT**
  - P/N: R12
    - 2/8”-14 UNF-2A THD
    - 1-3/16”-12 UN-2A
  - Lanyard and cap supplied with receiver. Replacement cap and lanyard available – P/N R1205

- **TRANSMISSION**
  - P/N: R14
    - 1-1/8”-14 UNF-2B THD
    - 1-3/16”-12 UN-2A
  - Lanyard and cap supplied with receiver. Replacement cap and lanyard available – P/N R1405

- **OIL**
  - P/N: R16
    - 1-5/8”-14 UNF-2A THD
    - 1-5/8”-12 UN-2A
  - Lanyard and cap supplied with receiver. Replacement cap and lanyard available – P/N R1605

- **HYDRAULIC**
  - P/N: R18
    - 1-5/8”-12 UN-2A THD
    - 1-7/8”-12 UN-2A
  - Lanyard and cap supplied with receiver. Replacement cap and lanyard available – P/N R1805

**Typical Installation**
VR300 VERY HIGH FLOW SYSTEM

Large Tanks need High rates!

Designed for use with very large off highway vehicles, the Wiggins VR300 System is designed to deliver fuel at rates up to 300 gallons per minute.

VR300 Features:
- Non-Pressurized shut-off
- Tank cannot be overfilled
- Optional Vapor recovery
- Direct of remote mounting
- Patented “JET-SENSOR” technology

VR300 system mounted on a 1,100 Gallon fuel Tank
VR300 – How It Works...

1. The nozzle and receiver mate using bayonet lugs. A 30° turn locks and seals the two mating components. The nozzle actuating handle will not move unless the nozzle has been attached and locked onto the receiver.

2. a. The nozzle actuating handle is rotated upward to the “ON” position which opens the nozzle and receiver poppets; b. Fuel flows through the nozzle and builds pressures within the receiver; c. Pressurized fuel flowing through the jet sensor opens the main fuel gate.

3. Fuel fills tank at a rate up to 300 gpm.

4. When fuel level reaches jet sensor, the pressure maintaining the open position of the main fuel gate is eliminated. A return spring closes the main gate and fuel ceases to flow into the tank.

5. a. With the main fuel gate closed the pressure within the receiver and nozzle builds; b. Pressurized fuel is forced through the hollow nozzle actuator shaft into the poppet return chamber; c. The pressure in the poppet return chamber pulls the nozzle-sealing poppet back to the closed position, and the red indicator button extends out the back of the nozzle.

6. The extended indicator button signals that the nozzle actuating handle may be rotated to the “OFF” position. Only when the actuator is in the “OFF” position will the nozzle rotate off the receiver.
Failsafe Operation

The VR300 is a closed circuit; pressure actuated refueling system that incorporates three main components: Nozzle, Receiver, and Jet Sensor. The work in concert to assure that fuel continues flowing only when all three components are properly connected and functioning. If any of the three components malfunctions or the tank is full, or the nozzle is not connected to the receiver, no fuel will flow, no accidental spills can occur.

Specifications:

<table>
<thead>
<tr>
<th>Component</th>
<th>With Vapor Return</th>
<th>Without Vapor Return</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nozzle</td>
<td>VR301</td>
<td>VR301</td>
</tr>
<tr>
<td>Receiver</td>
<td>VR305</td>
<td>VR325</td>
</tr>
<tr>
<td>Jet Sensor</td>
<td>VR306</td>
<td>VR306</td>
</tr>
<tr>
<td>Relief Valve</td>
<td>VR314</td>
<td>VR314</td>
</tr>
<tr>
<td>Air/Fuel Separator</td>
<td>VR311</td>
<td>Not Applicable</td>
</tr>
<tr>
<td>Concentric Hose</td>
<td>VR303</td>
<td>Use standard hose</td>
</tr>
<tr>
<td>Hose Adaptor</td>
<td>Not Applicable</td>
<td>VR300-5</td>
</tr>
</tbody>
</table>

Rated Flow: 10 to 300 Gal per Min (GPM)
Operating Pressure: 25 to 125 PSIG
Pressure Drop:
- < 7 psid @ 200 gpm
- < 18 psid @ 300 gpm
Disconnect Spillage: 3 cc, Max.
Housing Material: Aluminum
Weight: 9 lbs.