

HYDRAU-FLO®

Safety Solutions for Liquid Filling

Fast Fuel Filling and Float Control Valves

Mechanical and Non-Pressurised

Excellent
Minerals
Solutions

WEIR
MINERALS



The Hydrau-Flo® valve system is a safe and efficient refilling arrangement which removes the risk of overfilling, spillage and tank rupture while minimising safety and environmental hazards associated with liquid transfer.

Traditional Refueling Systems

With flow rates up to 1,000 litres per minute and pressures up to 100 kilopascals, overfilling, spillage and tank rupture are common problems associated with refueling.

Hydrau-Flo® Safety Solutions for Refueling

The Hydrau-Flo® valve system overcomes these problems without the need for electronics or complex arrangements prone to blockage and failure.



Right: Hydrau-Flo® HF1105Z0001*
Fuel Filler Safety Valve

Left: Hydrau-Flo® HF1008Z0001*
Float Valve



The Hydrau-Flo® system incorporates robustly designed fuel filler safety valves and float control valves to provide a reliable, hydraulically operated arrangement which depends on fluid level rather than pressure. The system is designed to be used in conjunction with existing "fast fill" systems.

- The Hydrau-Flo® valve system:
- Prevents overfilling
- Prevents fuel spillage and wastage
- Removes the risk of tank rupture due to pressure build up during and after filling
- Minimises the risk of fire as a result of fuel spillage
- Reduces costs associated with fuel wastage and equipment damage
- Significantly improves safety and environmental outcomes

Hydrau-Flo® Valve Range

Hydrau-Flo® Fuel Filler Safety Valves are available in three configurations to suit the majority of equipment types and applications.

The standard (Black) valve is ideal for all new equipment applications and existing equipment that has suitable fittings. The compact design delivers the highest flow rate capacity in the range.



HF1105Z0001*



HF1105Z0003*

The most commonly used retro fit (Blue) valve fits directly into truck and loader fuel tanks using the same thread (2" NPT) as the conventionally used dry break fittings (which are screwed back into the Hydrau-Flo® Fuel Filler Safety Valve). These valves fit into typical CAT and Komatsu fuel tank recesses.

This retro fit (Red) valve is designed to fit into tanks using the "Wiggins" ZNC3 recess. These are typically used on 776 and 773 trucks.



HF1105Z0002*

Hydrau-Flo® Float Control Valves are also available in different configurations designed to suit varying applications and filling requirements.

The Hydrau-Flo® Float Control Valve has a robust design for use on mobile equipment which ensures reliable pilot operation of the Hydrau-Flo® Fuel Filler Safety Valve. It also incorporates roll over shut off protection and an anti fuel surge breather vent to prevent spillage that can occur as a result of vehicle motion when using "conventional" valves.



HF1008Z0001*



HF1007Z0001*
HF1007Z0002*

This type of control valve is typically used on stationary equipment including skid mounted pump sets, generators and lighting plants. The simple and robust design provides a lower cost option for stationary equipment and is available in two different lengths.

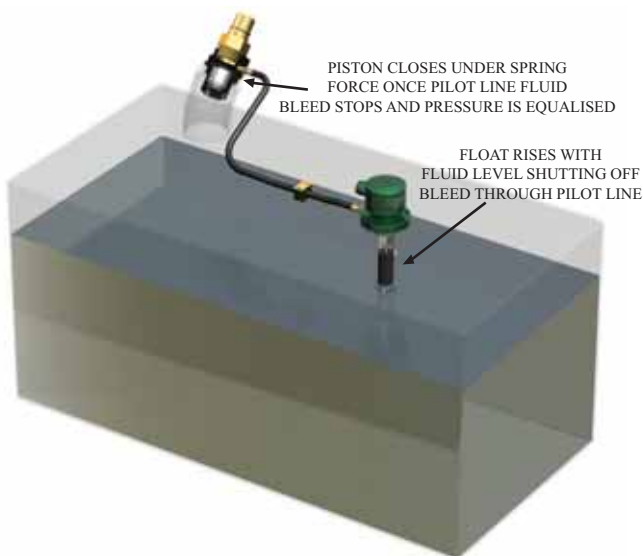
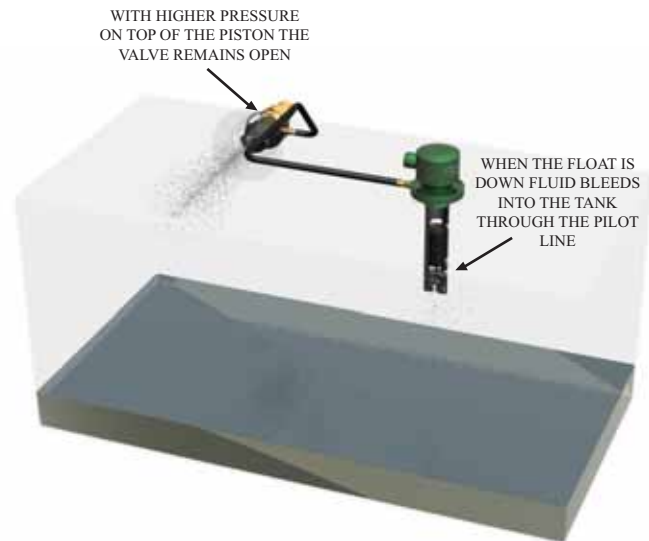
Hydrau-Flo® Non-Pressurised Fuelling System Operation

Hydrau-Flo® Fuelling Valves

Fuel enters the system through a conventional “fast fill” receiver and then flows into the Hydrau-Flo® valve body. Fuel pressure forces the shut off piston open against spring pressure and then flows through porting into the tank.

An orifice in the piston directs fuel through a capillary line to the float valve which allows a constant bleed into the tank until filling is complete.

This ensures that the pressure under the piston remains lower than that above.



When fuel reaches the required level the Float Valve is closed and the bleed into the tank is shut off. This equalises the pressure on both sides of the piston in the Hydrau-Flo® valve body.

With the pressure balanced the spring will then close the piston and stop fuel flow.

Using the Hydrau-Flo® valve system the fuel nozzle cannot be overridden and an air space is maintained in the tank, based on the set point of the float valve. The operation of the system depends on fluid level and not tank pressure.

This removes the potential for overfilling and pressurisation of the tank and prevents fuel loss through air vents which can be caused by expansion in liquid volume as a result of increased ambient temperatures.

“Conventional” Systems

Using conventional systems, overfilling, spillage and tank rupture can be common occurrences. At 1,000 litres per minute, every second of spillage equates to more than 15 litres of diesel wasted and released into the environment while the cost to repair or replace ruptured fuel tanks is significant in terms of materials, labour and equipment down time.

Hydrau-Flo® Valve Dimensions

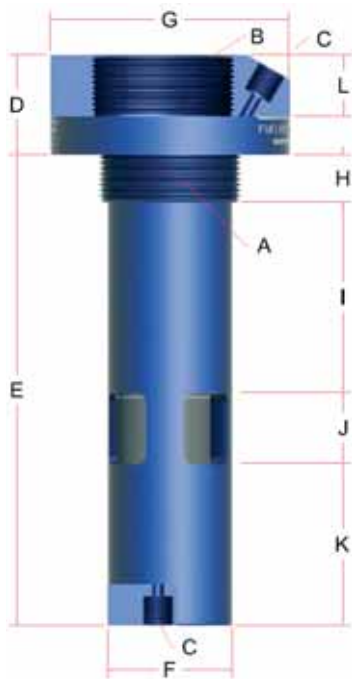
Fuel Filler Valves

Model	Colour Code	A Mounting Thread	B Coupling Thread	C Pilot Line Thread	D mm	E mm	F mm	G mm	H mm	I mm	J mm	K mm	L mm	Mass kg.
HF1105Z0001*	Black	75NPS	2"NPT	1/4" BSP	47 (1.85)	70 (2.76)	70 (2.76)	100 (3.94)	20 (0.79)	20 (0.79)	17 (0.67)	33 (1.30)	25 (0.98)	1.34 (2.95)
HF1105Z0003*	Blue	2" NPT	2"NPT	1/4" BSP	42 (1.65)	198 (7.80)	52 (2.05)	100 (3.94)	20 (0.79)	80 (3.15)	30 (1.18)	68 (2.68)	25 (0.98)	1.26 (2.78)
HF1105Z0002*	Red	2" NPT	2"NPT	1/4" BSP	72 (2.83)	198 (7.80)	52 (2.05)	84 (3.31)	20 (0.79)	80 (3.15)	30 (1.18)	68 (2.68)	25 (0.98)	1.56 (3.44)

Float Valves (HVFA and HVFC Series)

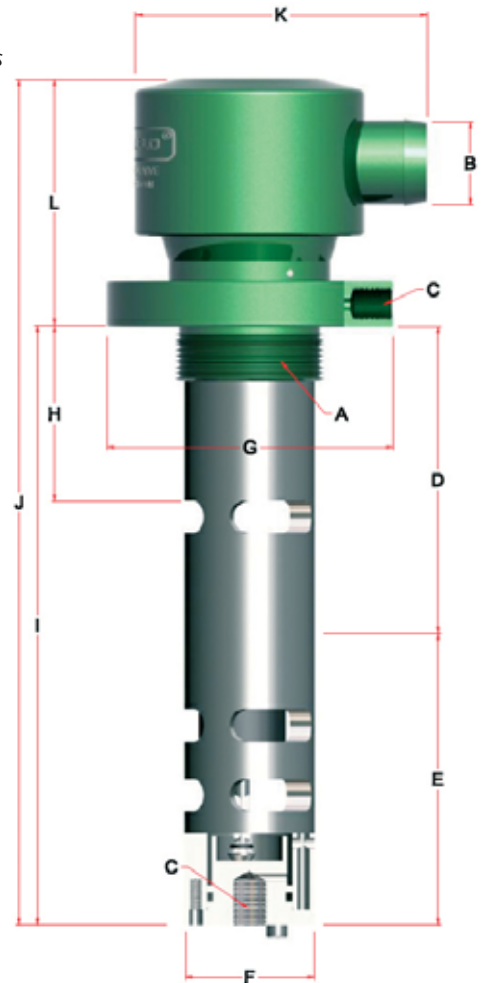
Model	Colour Code	A Mounting Thread	B Exhaust Port OD	C Pilot Line Thread	D Fuel Off Point mm	E mm	F mm	G mm	H mm	I mm	J mm	K mm	L mm	Mass kg.
HF1008Z0001*	Green (Standard)	2" NPT	34 (1.34)	1/4" BSP	120 (4.72)	122 (4.80)	52 (2.05)	115 (4.53)	69 (2.72)	242 (9.53)	340 (13.39)	118 (4.65)	100 (3.94)	1.8 (3.97)
HF1008Z0006*	Blue	2" NPT	34 (1.34)	1/4" BSP	74 (2.91)	122 (4.80)	52 (2.05)	115 (4.53)	25 (0.98)	196 (7.72)	300 (11.81)	118 (4.65)	100 (3.94)	1.66 (3.66)

Notes: Dimensional data is metric with imperial shown in (inches / lbs).
This information is a guide only and should be confirmed by your Weir Minerals representative before using.

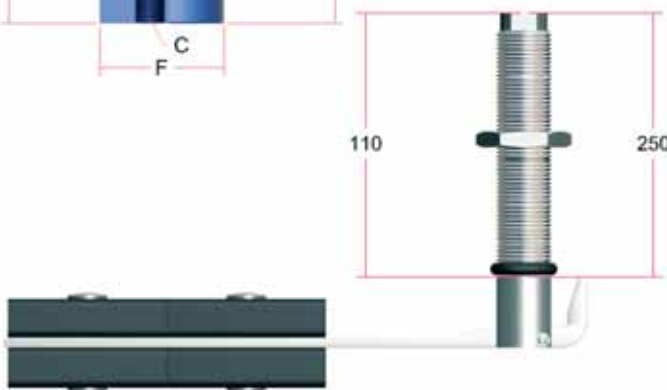


Left: Hydrau-Flo® Fuel Filler Safety Valves

Right: Hydrau-Flo® HVFA and HVFC Series Float Valves



Below: Hydrau-Flo® Lever Float Valves (Stationary Equipment Only)



* please note most part numbers have changed - cross reference guide available on page 8

A range of Hydrau-Flo® adaptors and accessories are available for simple and easy installation into most types of mobile and stationary equipment.

HYDRAU-FLO® FUEL FILLER SAFETY AND FLOAT VALVE ADAPTORS are available in a number of configurations designed for new equipment manufacture or fitment to most makes of existing mobile and stationary equipment. Some examples are shown below.



HF1102Z0001*
Adapts HF1105Z0001* (Black Valve) to fit to a 2" NPT (female) Socket.



HF1102Z0004*
Adapts HF1105Z0001* (Black Valve) to a 2" Hose Tail.



HF1102Z0002*
Weld-on Threaded Ring to mount HF1105Z0001* (Black Valve) directly into tank.



HF1102Z0012*
HF1102Z0013*
Weld-on Threaded Stand Pipe. Used to mount HF1105Z0001* (Black Valve) to top tank. (150, 310mm)



HF1102Z0005*
Adapts HF1105Z0001* (Black Valve) to fit to a 2 1/2" Hose Tail.



HF1102Z0010*
Weld-in Flush Mount to Suit HF1105Z0001* (Black Valve).



HF1103Z0002*
Weld-in Flush Mount to suit HF1105Z0003* (Blue Valve)



HF1102Z0003*
Bolt-in Flush Mount to suit Komatsu tanks. Suits internal mounting of HF1105Z0001* or external mounting of HF1105Z0003*



HF1103Z0003*
Adapts CAT D10R / D11R Fuel Inlet Hose to HF1105Z0003* (Blue Valve).



HF1103Z0004*
Adapts HF1105Z0003* (Blue Valve) to CAT D10R / D11R tank.



HF1011Z002*
2" NPT Socket—Weld into tank to allow direct mounting of HF1105Z0003* (Blue Valve).



ZNC3 / ZNC4
Wiggins Bolt-on / Weld-on Flush Mount—suits HF1105Z0002* (Red Valve) only.



HF1102Z0007*
Adapts HF1105Z0001 (Black Valve) and Valve Adaptor HF1102Z0001* to Liebherr 994 / 996 Excavator.



HF1102Z0008*
Adapts HF1105Z0001* to 'Cat' fuel tanks.



HF1012Z0002*
Lever Float / Breather Mounting Flange—Fits to HF1103Z0001 & HF1012Z0001.



HF1103Z0001*
Lever / Float Breather Screw-in Flange. Fits to 2" NPT Socket.



HF1012Z0009*
Adaptor Fuel Supply Hose to HF1105Z0001* valve to Liebherr 994 & 996



HF1011Z0001*
Adapts Float Control Valve HF1008Z0001* to CAT D10R / D11R tank.



HF1012Z0003*
Lever Float Mounting Flange—Fits to HF110370001 & HF101270001.



HF1012Z0001*
Lever Float / Breather Weld-in Flange

BREATHER COMPONENTS



HF1014Z0001*
Barrel Nipple—For mounting HF0304Z0003* Rain Cap Breather to HF1012Z0002*.



HFS27-1212*
Nipple 3/4" to 3/4" BSP. Used to connect HF1204Z0014* Swivel Tail to HF1012Z0002* Breather Mount or HF1014Z0002* Weld-on Bracket.



HF802-1212*
Swivel Hose Tail 3/4" BSP to 3/4" Hose. Connects 3/4" Nipple to Breather Hose.



HF1014Z0002*
Weld-on Bracket to suit Rain Cap Breather HF0304Z0003*.



HF0304Z0003*
Rain Cap Breather.



HF1008Z0002*
Anti-Surge Breather—Fits 2" NPT Socket or HF1102Z0002* Weld-in Flange.



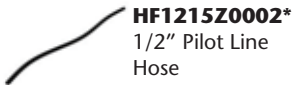
HF1008Z0003*
Adapts Anti Surge Breather to HF1012Z0002* Lever Float / Breather Mounting Flange.



HF1011Z0002*
2" NPT Socket—Weld into tank Wall to suit Anti-Surge Breather HF1008Z0001*, HF1008Z0006*, and HF1008Z0002*.

Accessories are available to complete Hydrau-Flo® kits and provide customers with the fully packaged solution. Some of the many accessories available are shown below.

HOSES



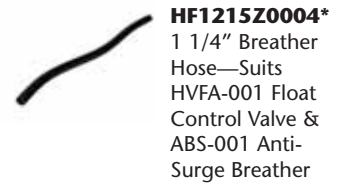
HF1215Z0002*
1/2" Pilot Line
Hose



HHP112
3/4" Breather
Hose—Suits Rain
Cap Breather



HF1215Z0003*
1" Breather Hose



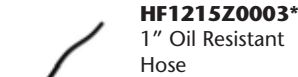
HF1215Z0004*
1 1/4" Breather
Hose—Suits
HVFA-001 Float
Control Valve &
ABS-001 Anti-
Surge Breather



HF1215Z0005*
3/8" Single Wire
Hose 'Survivor'
for inside tank
installation.



HHT16A
3/8" Single Wire
Hose 'Ryco'
for inside tank
installation.



HF1215Z0003*
1" Oil Resistant
Hose

PILOT LINE FITTINGS



HF1204Z0003*
1/4" BSPT Brass Plug. Used to Plug
unused Pilot Line Ports.



HF550-060606*
3/8" BSP 'T'



HF527-0806*
Nipple 3/8" up to 1/2" BSP. Used
to connect Push-on Fittings to
check Valves.



HF1204Z0002*
Pilot line Check Valve. 3/8" BSP
female to 3/8" BSP female, use
where 2 x Float Valves are used
connected to 1 x Filler Valve.



HF572-0406*
Adaptor Female 1/4" BSP to Male
3/8" BSP.



HF1204Z0001*
Pilot Line Check Valve. 3/8" BSP
Female to 3/8" BSP Female. Used
where 2 x Hydrau-Flo Filling Valves
are connected to 1 x Pilot Float.
(2 Required).



HF527-0804*
- Reducing Nipple 1/4" x 1/2"



HF58-0409*
Elbow 1/4" BSP x 9/16" JIC."



HF802-0808*
- Swivel Hose Tail Straight
1/2" x 1/2"



HF805-0808*
- Swivel Hose Tail 90° 1/2" x 1/2"

RECEIVERS



HF1113Z0002*
Wiggins 5PSI Receiver.



HF1113Z0001*
Spring to convert a Wiggins
Receiver to 13PSI

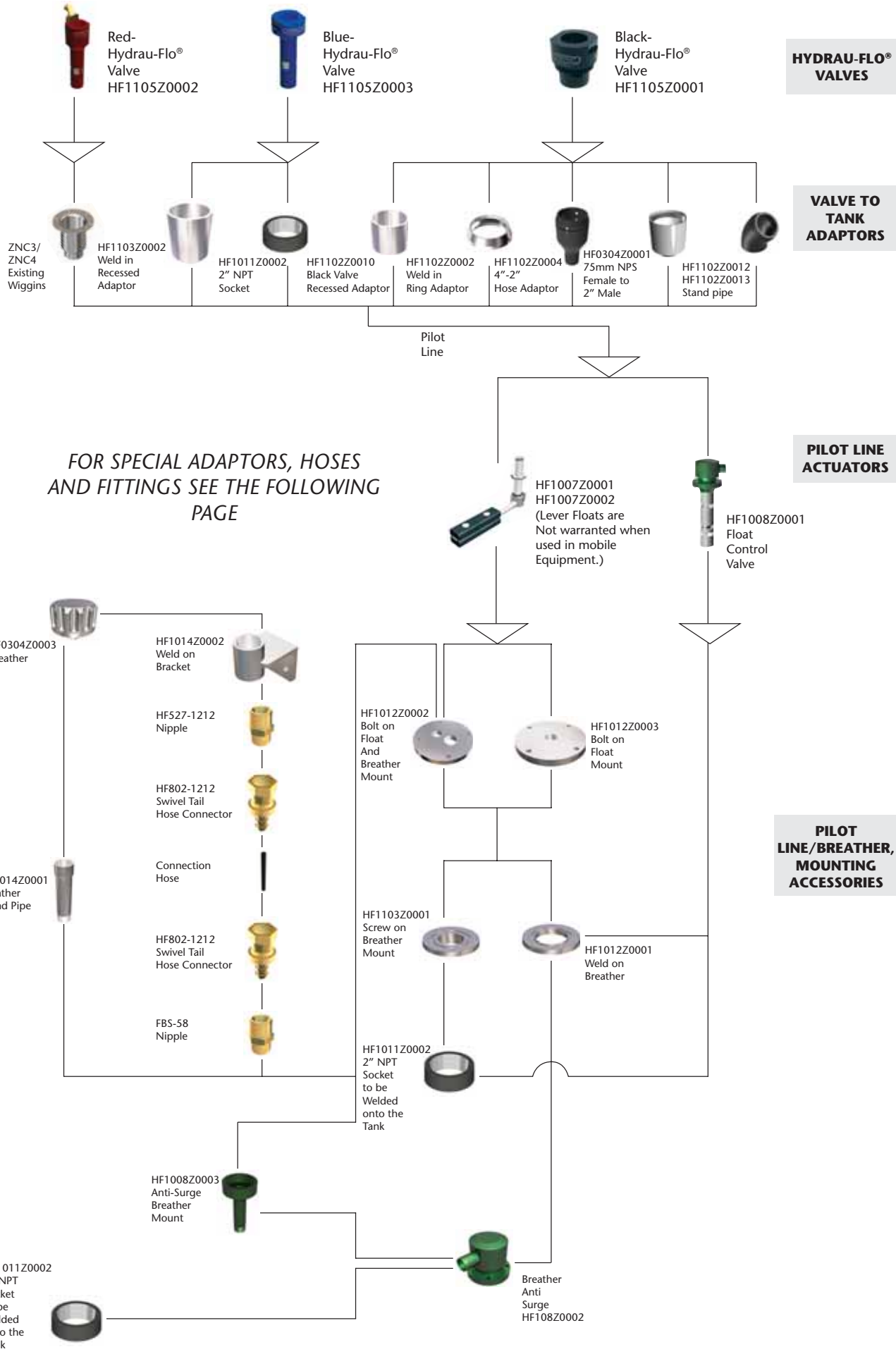


HF1113Z0003*
Banlaw receiver (Light)

The Hydrau-Flo® Adaptors and Accessories shown above are only an example of those available and Weir Minerals Australia continue to develop new products according to customer requirements.

*** please note most part numbers have changed - cross reference guide available on page 8**

HYDRAU-FLO® SELECTION GUIDE



The Hydrau-Flo® valve system is a safe and efficient refilling arrangement which removes the risk of overfilling, spillage and tank rupture while minimising safety and environmental hazards associated with liquid transfer.



Caterpillar 16H Grader



O&K RH 200 Shovel



Caterpillar 24H Grader



Liebherr 996 Shovel



Skid Mounted Pump Unit

Caterpillar D11R Dozer



The Hydrau-Flo® Safety Solutions include a range of robustly designed adaptors and accessories to provide for ease and simplicity of installation on most equipment.

Brand new part No.	Description	OLD PART
HF1008Z0002	Anti Surge Breather Complete. Anti-Surge Breather—Fits 2" NPT Socket or FBS-09 Weld-in Flange.	ABS-001
HF1304Z0001	Anti Surge Tank.	AST-001
HF1102Z0001	Valve Housing (Aluminium) (Suit fuel brake) Adapts FBS-03A (Black Valve) to fit to a 2" NPT (female) Socket.	FBS-02
HF1105Z0001	Valve Assembly, black.	FBS-03A
HF1103Z0001	Adaptor. Lever / Float Breather Screw-in Flange. Fits to 2" NPT Socket.	FBS-05
HF1012Z0001	Lever Float / Breather Weld-in Flange.	FBS-06
HF1012Z0002	Mounting Plate. Level Float / Breather Mounting Flange — Fits to FBS-05 & FBS-06.	FBS-07
HF1012Z0003	Lever Float Mounting Flange — Fits to FBS-05 & FBS-06 / Aluminium Mount.	FBS-08/ FBS-08A
HF1102Z0004	Adaptor Hydrau-Flo valve, 2" hose tail. Adapts FBS-03A (Black Valve) to a 2" Hose Tail.	FBS-14-50
HF1102Z0005	Adaptor Hydrau-Flo valve, 2 1/2" hose tail. Adapts FBS-03A (Black Valve) to a 2 1/2" Hose Tail.	FBS-14-65
HF1102Z0006	Adaptor to suit black valve 3" hose tail.	FBS-14-75
HF1007Z0001	Float Assembly	FBS-66-110
HF1007Z0002	Float Assembly	FBS-66-250
HF1105Z0002	Valve Assembly, c/w Port Block - Red valve.	HF50-03A
HF1105Z0003	Valve Assembly - Blue valve.	HF50-09A
HF1103Z0003	Adaptor (Suit Hydrau-Flo / D11 Dozer). Adapts CAT D10R / D11R Fuel Inlet Hose to HF50-09A (Blue Valve).	HF50-10
HF1103Z0004	Adaptor (Suit Hydrau-Flo / D11 Dozer). Adapts HF50-09A (Blue Valve) to CAT D10R / D11R tank.	HF50-11
HF1011Z0001	Adaptor (Suit Cat D11 Dozer). Adapts Float Control Valve HVFA-001 to CAT D10R / D11R tank.	HF50-13
HF1008Z0001	Hydrau-Flo Vertical Float Assembly	HVFA-001
HF1008Z0004	Vertical Float Assembly	HVFA-001-100
HF1008Z0005	Vertical Float Assembly Fitted with a 150mm Extension	HVFA-001-150
HF1009Z0001	Vertical Float - Budget model (without the roll over protection - a separate breather may be required)	HVFB-001
HF1008Z0006	Vertical Float (Short Series)	HVFC-001
HF1113Z0002	Wiggins 5PSI Receiver.	JNC2A
HF0304Z0003	Rain Cap Breather	MVP63RV-077
HF0304Z0002	Breather, Fuel Tank.	UCSAB1562-40

Trouble Shooting

Symptom	Cause	Remedy
Fuel nozzle shutting off prematurely	Nozzle or receiver spring setting too low	Check condition and rating of spring, replace if necessary.
	Back pressure in filler pipe too high	Ensure there is no excessive restriction in the flow of fuel from Hydrau-Flo® to the tank
	Breather blocked	Check and clean or replace if necessary
	Float valve set too low in tank	Adjust to desired fill height
	Restriction in capillary line	Check line for damage, kinks or crushing, replace if necessary
Fuel nozzle not shutting off	Float valve not closing capillary line	Check operation of float does not hit internal walls of fuel tank, check valve seat for damage or obstruction
	Piston stuck open	Check piston operation is smooth and unrestricted.
	Leakage in capillary line	Check line and fittings for leaks or damage
	Float level set above breather height	Lower float level below height of breather.
	Float level set too high, not allowing enough air space for fuel expansion due to rise in temperature.	Lower float level setting.
Fuel weeping from breather after tank has been filled		

Weir Minerals Offices



The Weir Group PLC, founded in Scotland in 1871, is a leading global engineering company with more than 8000 employees worldwide and is listed on the London Stock Exchange.

Weir Minerals Multiflo is part of the Weir Minerals Division and has primary global design responsibility for the Multiflo self-prime dewatering pump product range and Hydra-Flo® fuel filler valve.

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Weir Minerals Australia, Ltd.'s and/or Weir Minerals Multiflo's products may be covered by one or more of the following patents and/or pending patent applications: 6,311,723 (USA), 120517 (TW), 504740 (NZ), 767110 (AU), 2309521 (CA), 2350446 (UK), 234250 (MX), 2003277957 (AU), 2504239 (CA), 37569043.5 (EU), 539739 (NZ), WO0200510199 (ID), 10/533,164 (USA).