

## CHAPTER 8.0

### ACCESSORIES

#### 8.1 INTRODUCTION

This section provides the manufacturer's advice on how to install DSI accessories including the hot water shroud, low pressure inflator hoses, the weld lens assembly, the double exhaust, and accessory mounting brackets.

#### 8.2 HOT WATER SHROUD INSTALLATION PROCEDURES

The Hot Water Shroud (DSI Part #525-100) should be used whenever diving in water colder than 35.6 ° (2° C). The DSI hot water kit is designed to be integrated with a hot water supply to help maintain breathing gas temperature at an acceptable level for the diver. In addition the hot water reduces the possibility of ice forming in the demand regulator or gas train components. Even with water temperatures of 40F (4° C) the diver can experience discomfort and severe heat loss through the respiration process. For this reason, DSI recommends installing the hot water shroud when diving in waters colder than 40 F (4° C). Water supply to shroud assembly should be at least 1 gallon (3.7 liters) per minute at a minimum temperature of 105 F (42° C). When diving operations are conducted during severe cold surface temperatures a hot water shroud should be used to prevent ice from developing in and on gas train components while the diver is on the surface.

##### Tools Required:

1/4 inch Flat Blade Screwdriver

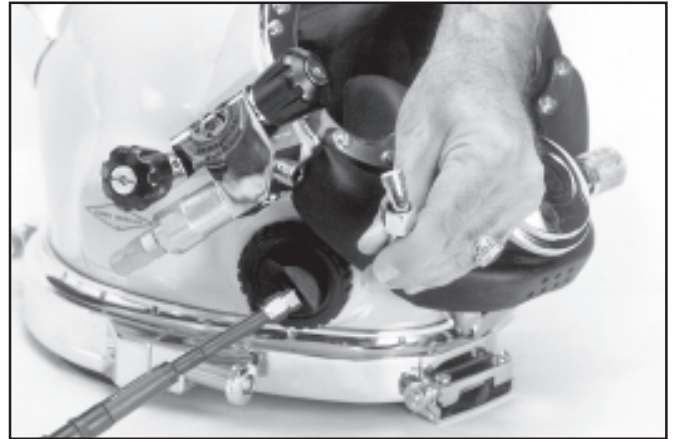
7/8 inch open end wrench

Torque Wrench

7/8 inch Open End Attachment for Torque Wrench

11/16 inch Open End Attachment for Torque Wrench

1) Disconnect the bent tube assembly (16) at the side block end only. Loosen the jam nut (108) at the regulator. If the bent tube will not swivel freely, you must loosen the large nut at the regulator.



*Loosen the bent tube.*

2) Remove the free flow knob (3), locknut (1), and spring (2).



*Remove the free flow knob.*

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3) Remove the auxiliary valve knob (24), nut (26), and spring (25).

4) Screw the regulator adjustment knob (98) in all the way.



*Pull the shroud over the regulator.*

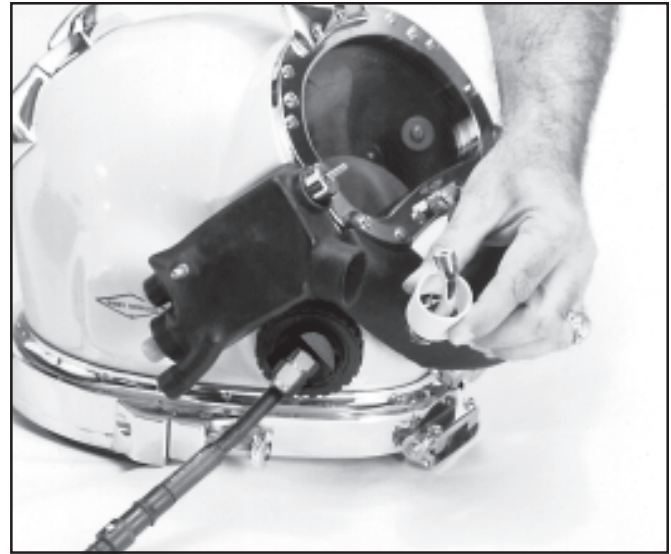
5) To install the rubber regulator cover, slide it over the bent tube assembly (16) and stretch it over the regulator adjustment knob (98).



*Position the shroud over the side block.*

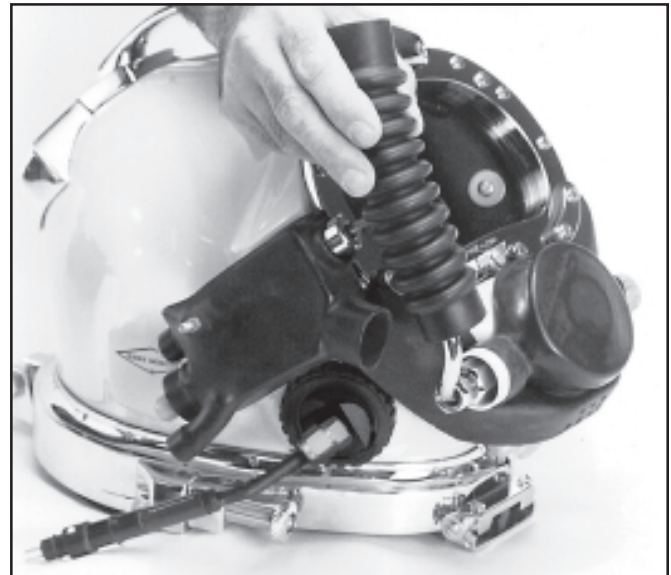
6) Install the rubber side block cover. Start by inserting the non-return valve (37) through the square hole on the back side of the cover. All the other holes will then line up correctly.

7) Slide one of the PVC Flanges (DSI Part #520-046) over the bent tube (16) and insert it into the regshroud.



*Slide one of the PVC pieces over the bent tube and insert it into the regulator shroud.*

8) Slide the corrugated tube over the bent tube (16). The PVC flange previously installed in the regshroud mates with the corrugated tube, with the tube rubber going over the PVC Flange and the regshroud rubber.



*Install the corrugated tube.*

9) Install the second PVC flange in the other end of the corrugated tube. (1/4 of the flange should still show).

10) Attach the side block end of the bent tube to the side block assembly (39). Using the torque wrench and 11/16 attachment, tighten to 100 inch lbs (112 kgcm). If the regulator end of the bent tube was loosened, torque the jam nut (108) to 100 inch lbs (112 kg cm).

11) Retighten jam nut (108). Slide the PVC flange up towards the side block and install it in the side block rubber tube. (1/4 of the flange should still show).



*Install the second PVC flange in the side block shroud tube.*



12) Stretch the corrugated tube over the PVC flange and the side block rubber tube.



13) Wrap the tie wraps around the corrugated tube at the PVC stiffeners and tighten.



*The complete installation.*

14) Trim the excess ends from the tie wraps.

15) Reinstall the free flow knob (3), spring (2), and lock nut (1). Tighten with a flat blade screwdriver until the valve stem is flush with the lock nut face.

16) Reinstall the auxiliary valve knob (24), spring (25), and nut (26). Tighten the locknut with a flat blade screwdriver until the valve stem is flush with the lock nut face.

17) The completed installation should appear as pictured above.

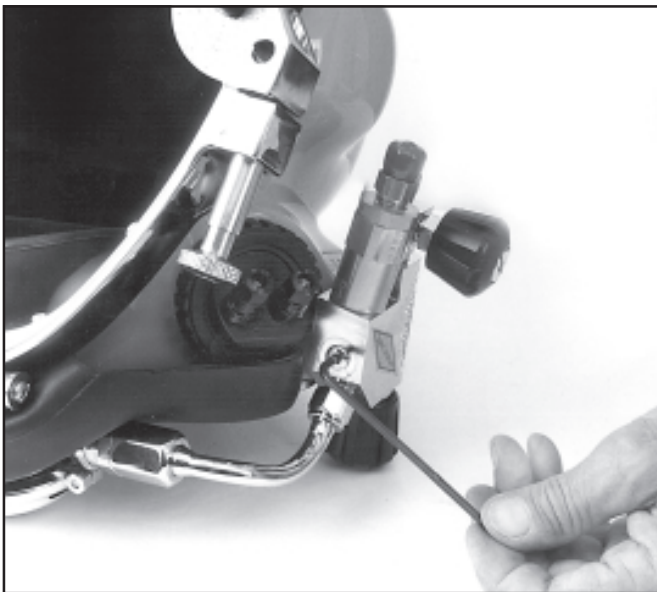
### 8.3 LOW PRESSURE INFLATOR HOSE INSTALLATION ON THE SIDE BLOCK

The low pressure inflator system may be used with either conventional buoyancy compensators or dry suit systems. For certain pieces of equipment it may be necessary to use a longer inflator hose than is originally supplied by the manufacturer of the low pressure system.

**Tools Required:**

5/32 inch Allen Wrench Attachment on Torque Wrench

- 1) Remove the plug (17) from the side block.  
*Save this plug*



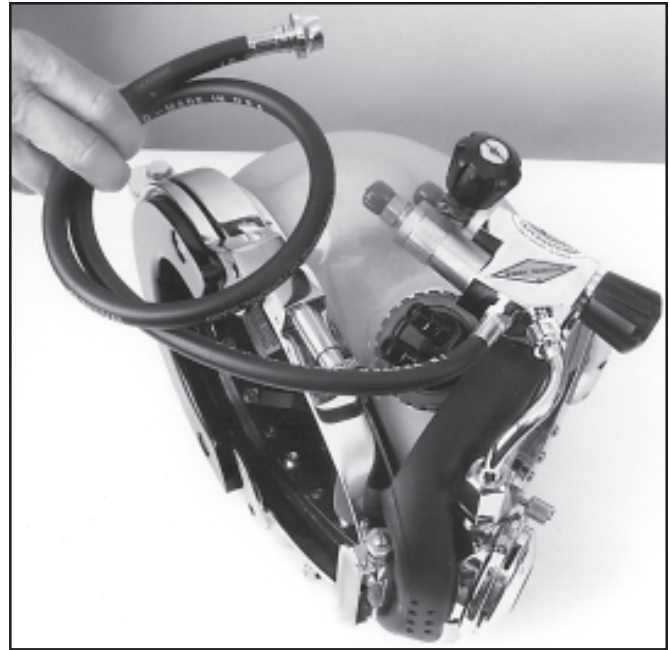
*Removing the plug from the side block.*

- 2) Check the O-ring on the low pressure whip to be sure it is present and in good condition. Carefully screw the low pressure whip into the side block.

- 3) Tighten fitting to the specifications provided by the dry suit manufacturer. Do not overtighten.

- 4) Pressurize helmet and test connection for leaks.

**⚠ CAUTION!** When using the low pressure port on the side block for attachment of a low pressure hose, a hose with built in flow restriction or the DSI Flow Restrictor Adapter, DSI P/N 555-210 must be used.



*Installing a low pressure inflator hose for a dry suit.*

### 8.4 WELD LENS ASSEMBLY INSTALLATION INSTRUCTIONS

**Tools Required:**

3/8 inch Open End Wrench

1/4 inch Flat Blade Attachment on Torque Screwdriver

- 1) Remove the two plug screws (79) from the port retainer (78). Refer to the drawing included with the weld lens assembly kit for the remainder of the location numbers.



*Remove the two plug screws from the port retainer*



*Install the screws through the mount ears.*

2) Insert the screws through the mount ears.

**⚠ DANGER:** Use only the screws provided with the Weld Lens Kit for installation of this assembly. Longer screws will damage the helmet shell and/or the threaded inserts. This could cause flooding through the port.



*Tighten the weld lens assembly.*

4) Tighten the two lock nuts on the ends of the hinge studs so that the welding lens assembly can be flipped up, but will not fall down from its own weight.

## 8.5 WELD SHIELD ASSEMBLY INSTALLATION INSTRUCTIONS

Tools Required:

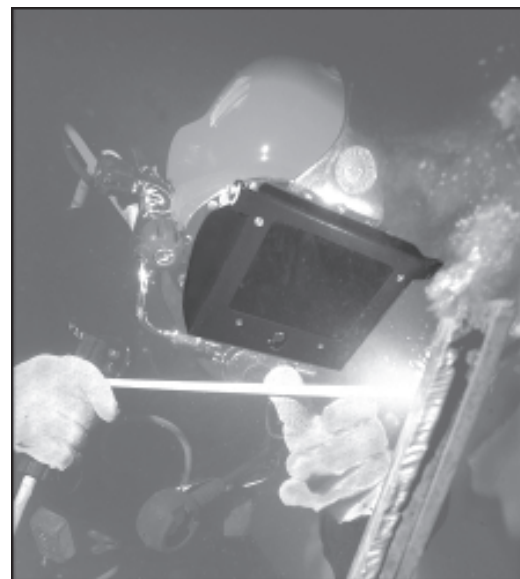
3/8 inch Open End Wrench

1/4 inch Flat Blade Attachment on Torque Screwdriver

1) Remove the two plug screws (79) from the port retainer (78). Refer to the drawing included with the weld shield assembly kit for the remainder of the location numbers.



2. Insert the mount screws (6) through the spacer washers (7) and then through the mount ears (10,11).



3. With the shield facing out of the helmet or mask, install and tighten the two mount screws (6) into the port retainer.

## 8.6 USE OF QUICK DISCONNECT

A Quick Disconnect can be used with all bail-out systems. It provides greater convenience on deck while dressing the diver. It also makes it possible to separate the attachment of the bail-out from the helmet should the diver become entangled underwater. All quick disconnects used must be of good quality and be capable of supplying gas without any additional flow restriction. All quick disconnects used in countries that adhere to CE standards must be CE approved.

A quick disconnect is designed to be installed in any low pressure port of the diver's bail-out regulator. The connector splits the hose into two halves, with a male connector on one end and a female connector on the other. The female connector should be equipped with a sleeve lock that must be properly aligned before the hose can be disengaged.

One end of the connector is designed to be attached to the auxiliary valve assembly (27), while the other end of the connector is designed to attach to any of the standard low pressure ports on the DSI SuperFlow first stage regulator (or any high performance regulator) used for the bail-out supply.



## 8.7 DOUBLE EXHAUST INSTALLATION

The double exhaust system is used in situations where the diver needs added protection to help prevent a back flow of biological and certain chemical contaminants into the helmet. On the SuperLite 17K this is accomplished through a specially designed assembly which incorporates two mushroom style flapper valves. This system has been used successfully for diving in biologically contaminated environments. However, there are certain chemicals (i.e. Toluene, Acetic acid etc.) that will attack the rubber in the valves in the exhaust assembly .

***BE AWARE OF WHAT YOU ARE DIVING IN!*** All divers must be aware of the types of pollutants and concentrations that they are working in. ***IT IS EXTREMELY IMPORTANT THAT DIVERS BE SPECIFICALLY TRAINED AND UNDERSTAND THE HAZARD'S ASSOCIATED WITH CONTAMINATED WATER DIVING.*** More information on contaminated diving and high-risk chemicals may be found in the publication "Diving in High-Risk Environments" by Steven Barsky.

It is important that divers are aware that the double exhaust valve assembly increases the exhalation effort of the regulator and therefore the overall work of breathing. This increase is not normally noticed at depths of less than 100 fsw (30 msw) but becomes more apparent as depth increases. This is due in part to the increased density of the breathing gas which causes an increase in exhalation effort and raises the overall work effort required by the diver to breath. The diver should take this into consideration and either restrict dives using the double exhaust to depths of less than 100 fsw (30 msw) or adjust his work load/rate so as not to become exhausted.

**⚠ CAUTION!** When diving the helmet with the double exhaust whisker assembly the diver should adjust his work load/rate so as not to become exhausted.

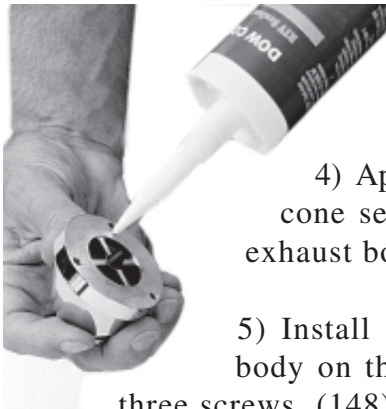
Tools Required:

1/4 inch Flat Blade Attachment on Torque Screwdriver

1) Remove the two whisker kidney plates and spacers and screws. These will be used in the installation/reassembly.

2) Remove the main exhaust body (149) and clean off all traces of the old silicone sealant.

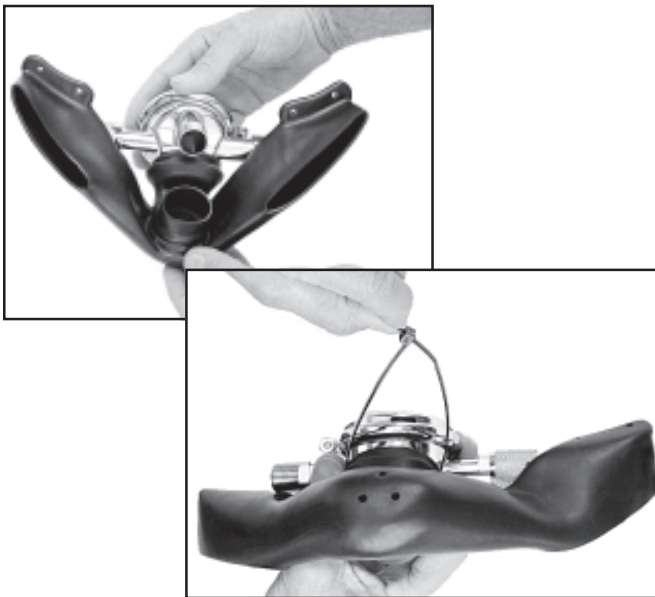
3) Following the instructions in Section 6.7.5, remove the regulator and exhaust whisker. This will require removal of the nose block device, oral nasal and bent tube.



4) Apply a bead of silicone sealant to the double exhaust body flange.

5) Install the double exhaust body on the helmet using the three screws (148) that held the main exhaust body in position.

6) Attach the double exhaust whisker to the regulator exhaust flange. Secure with a tie wrap, DSI Part #520-039.



7) Install the regulator in the helmet, with the regulator mount nut hand tight.

8) Attach the double exhaust whisker to the main exhaust body. Make sure the internal rubber ridge is in the groove in the main exhaust body. Secure it with a tie wrap, DSI Part #520-042.

9) Attach the bent tube.

10) Secure the whisker with the screws, spacers and kidney plate removed earlier.

11) Tighten the regulator mount nut and bent tube attachments.

12) Reinstall the oral/nasal and nose block device.

**! DANGER! Any helmet/dry suit system must be leak tested according to the manufacturer's instructions before EVERY dive in contaminated water!**

12) Allow 24 hours for the silicone sealant to cure before diving with the helmet. Test the helmet for leakage before diving in contaminated water.

**! DANGER: The exhaust valves used in the double exhaust system and regulator must be regularly inspected and replaced whenever they show the slightest signs of wear. If this is not done, leakage into the helmet and breathing system may occur. This can be fatal, depending on the type of contaminant to which the diver is exposed.**

### 8.8 ACCESSORY MOUNTING BRACKETS

An optional Bracket Kit (DSI Part # 525-717) is available for mounting accessory lights, cameras etc. on the SuperLite 17K.



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### 8.8.1 Mount Bracket Installation

1) Remove two port retainer screws (77), one on either side of the TV handle. These will not be reused to mount the brackets.

2) To install the port and starboard side mount brackets, the handle (60) must be removed as described in section 7.13.1. Remove the two top weight screws (58) and washers (59). These will be reused to mount the brackets.

3) Position the two mount brackets on the helmet and reinstall the two top weight screws (58) and washers (59). Do not tighten these yet.

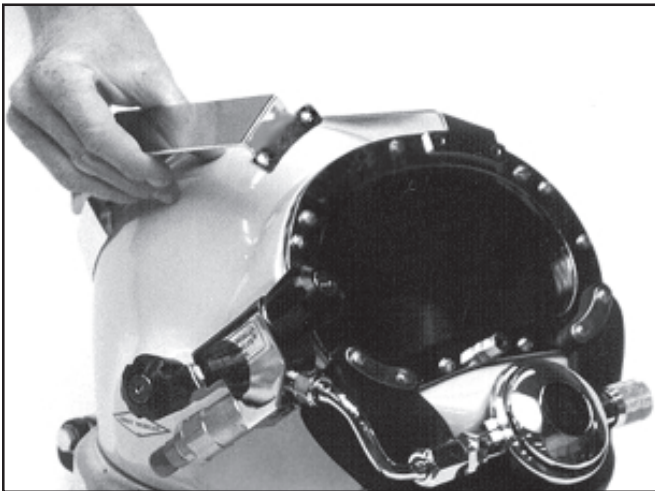
4) Position the front bracket holes over the holes in the port retainer. Install the two new screws (DSI Part # 530-040) supplied in the kit in the outside bracket holes.

5) Position the handle (60) on the helmet and reinstall the three front mount screws (61) until snug, not tight.

2) Thread the rear handle mount screw (58) with its washer (59) into the top weight (57). Turn this screw until it is snug, not tight.

3) Tighten the front mount screws (61) and the new bracket screws to their proper torque setting. (see Appendix 1)

4) Tighten the top mount screws (58) to their proper torque setting. (see Appendix 1)



*Position the two mount brackets on the helmet*



*Reinstall the two rear weight screws and washers*



## APPENDIX 1 : TORQUE SPECIFICATIONS

LOCATION NUMBER	DSI PART #	DESCRIPTION	TORQUE IN INCH POUNDS	TORQUE KG.CM
5	550-020	Bonnet	100	112
11	550-024	Stud	50	56
14	555-154	Bent Tube assy., side block end	100	112
17	550-094	L.P. Plug	50	56
19	550-140	Auxiliary valve body	3 turns by hand, 3 turns by wrench	
23	550-032	Packing nut	45 after seating	
29		Body	240	270
35		Seat	240	270
36	555-117	Adapter, brass	3 turns by hand, 3 turns by wrench	
37	555-195	One way valve	240	270
52	530-018	Screw	16	18
53	530-015	Screw	34	38
45	550-081	Nut, regulator mount	100	112
54, 55 & 65	530-070	Screw	30	26
58	530-079	Screw	30	26
61	530-045	Screw	12	13
72	530-317	Nut	20	23
69	530-317	Nut	45	50
73	530-050	Screw	18	20
114	530-032	Screw	14	16
107	550-062	Knob, nose block	23	25
77	530-035	Screw	12	13
76	530-052	Screw	18	20
89	550-055	Packing nut	40 after seating	
94	530-030	Screw	8	10
102	550-048	Inlet Nipple	40	46
101	550-050	Jam Nut	100	112
81	530-045	Screw	12	13
119	530-032	Screw	24	26
160	530-024	Screw	14	16
159	530-220	Screw	14	16
162	530-022	Screw	24	25
167	530-200	Bolt	100	112
173	530-064	Screw	36	40

## Table of Equivalents

To convert units appearing in Column 1 (left column) into equivalent values in Column 2 (center column), multiply by factor in Column 3. Example: To convert 7 gallons into cubic inches, multiply 7 x 231 = 1617. To convert units appearing in Column 2 (center) into equivalent values of units in Column 1 (left), divide by factor in Column 3. Example: To convert 25 horsepower into Btu per minute, divide 25 by 0.02356 = 1061

<b>TO CONVERT</b>	<b>INTO</b>	<b>MULTIPLY BY</b>
<b>INTO</b>	<b>TO CONVERT</b>	<b>DIVIDE BY</b>
Atmospheres	Feet of Water	33.9
Atmospheres	Inches of Mercury (Hg)	29.92
Atmospheres	PSI (LBS per Sq. Inch)	14.7
BTU	Foot Pounds	778.3
BTU per hour	Watts	0.2931
BTU per minute	HorsePower	0.02356
Celsius (Centigrade)	Fahrenheit	°C x 1.8 + 32
Centimeters	Inches	0.3937
Cubic Centimeters	Gallons (U.S. Liquid)	0.0002642
Cubic Centimeters	Liters	0.0001
Cubic Feet	Cubic Inches	1728
Cubic Feet	Gallons (U.S. Liquid)	7.48052
Cubic Inches	Cubic Feet	0.0005787
Cubic Inches	Gallons (U.S. Liquid)	0.004329
Days	Seconds	86.400
Degrees (Angle)	Radians	0.01745
Feet	Meters	0.3048
Feet	Miles	0.0001894
Feet of Water	Atmospheres	0.0295
Feet of Water	Inches of Mercury (Hg)	0.8826
Feet of Water	PSI (Lbs per Sq. Inch)	0.4335
Feet per Minute	Miles per Hour	0.01136
Feet per Second	Miles per Hour	0.6818
Foot-Pounds	BTU	0.001286
Foot-Pounds per Minute	Horsepower	0.0000303
Foot-Pounds per Second	Horsepower	0.001818
Gallons (U.S. Liquid)	Cubic Feet	0.1337
Gallons (U.S. Liquid)	Cubic Inches	231
Gallons of Water	Pounds of Water	8.3453
Horsepower	BTU per Minute	42.44
Horsepower	Foot-Pound per Minute	33.000
Horsepower	Foot Pounds per Second	550
Horsepower	Watts	745.7
Hours	Days	0.04167
Hours	Weeks	0.005952
Inches	Centimeters	2.54
Inches of Mercury (Hg)	Atmospheres	0.03342
Inches of Mercury (Hg)	Feet of Water	1.133
Inches of Mercury (Hg)	PSI (Lbs. per Sq. Inch)	0.4912
Inches of Water	PSI (Lbs. per Sq. Inch)	0.03613
Liters	Cubic Centimeters	1000
Liters	Gallons (U.S. Liquid)	0.2642
Micron	Inches	0.00004
Miles (Statute)	Feet	5280
Miles per hour (MPH)	Feet per Minute	88
Miles per hour	Feet per Second	1.467
Ounces (Weight)	Pounds	0.0625
Ounces (Liquid)	Cubic Inches	1.805
Pints (Liquid)	Quarts (Liquid)	0.5
Pounds	Grains	7000
Pounds	Grams	453.59
Pounds	Ounces	16
PSI (Pounds per Sq. Inch)	Atmospheres	0.06804
PSI (Pounds per Sq. Inch)	Feet of Water	2.307
PSI (Pounds per Sq. Inch)	Inches of Mercury (Hg)	2.036
Quarts	Gallons	0.25
Square Feet	Square Inches	144
Temperature (°F - 32)	Temperature (°C)	0.5555
Tons (U.S.)	Pounds	2000
Watts	Horsepower	0.001341