

MPS DOCUMENTATION

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Section 2.a Pump Valve Assembly

Tools for Assembly

#2 Philips screwdriver

Flat screwdriver

Open end wrenches – 9/16", 3/4"

Tubing cutter

Prints Needed for Assembly

Operation	Print #	Description of Print
10	213-1045-00	Pump Valve Assembly

Operation 10

- Set up test fixture: Connect VRC gauge to the top side of a "Tee" fitting. See fig EXP2.a-1. Thread in an adapter (PM0759) with 4 wraps of teflon tape into the left hand side of the Tee. Thread in a second adapter (PM0759) with 4 wraps of teflon tape into the right hand side of the Tee. See fig EXP2.a-2.



**VACUUM
GAUGE**



**ADAPTER
(PM0759)
WITH 4 WRAPS
OF TEFLON
TAPE**

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Operation 20

6. Connect test assembly (see fig EXP2.a-3) to left hand side of Tee fitting (see fig EXP2.a-4) with gasket (PM0595) and clamp (PM0594). See fig EXP2.a-5.

Fig EXP2.a-1

Test assembly
for valve
adjustment



CONNECT TO
LEFT HAND
SIDE OF TEE
FITTING

Fig EXP2.a-2

Tee fitting



LEFT HAND
SIDE OF TEE
FITTING

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Fig EXP2.a-3

Gasket and clamp used to join test assembly to Tee fitting

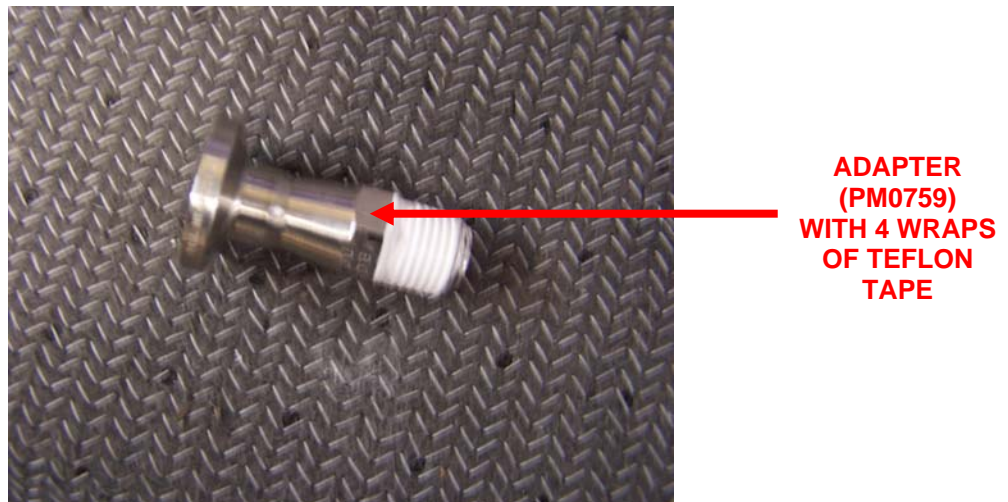


Operation 30

5. Wrap adapter (PM0759) with 4 wraps of teflon tape. Thread into "A" port of 3 way valve (PM0822). Tighten with 9/16" open end wrench. Using a flat screwdriver, turn the screw on the "P" port and "R" port counter-clockwise 3 full turns. See fig EXP2.a-5,6

Fig EXP2.a-4

Adapter with teflon tape applied



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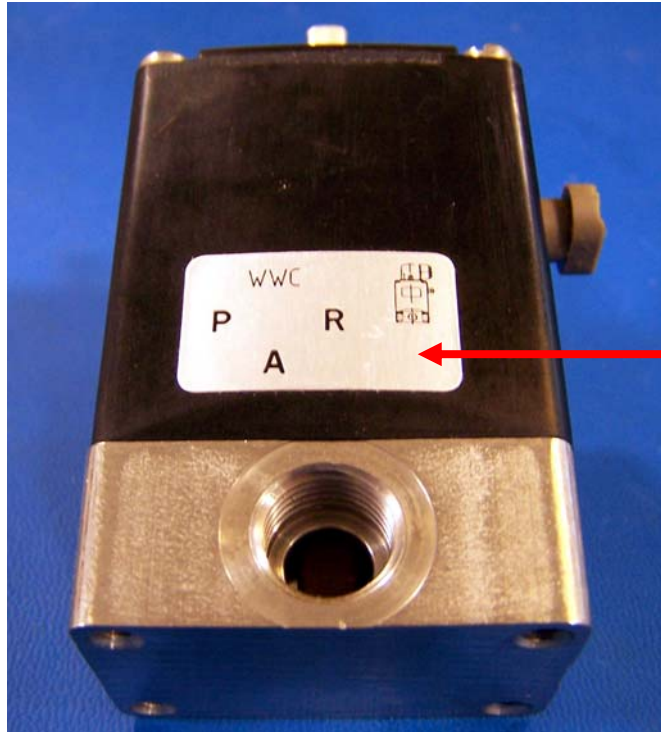
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Fig EXP2.a-5

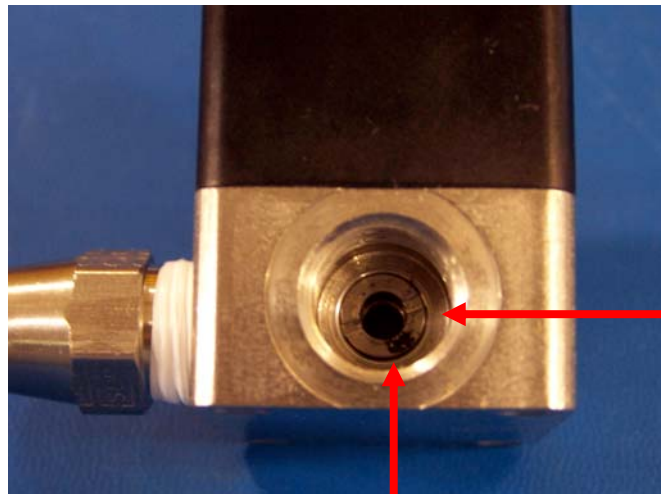
3 way valve



LABEL SHOWS
PORT
LETTERS

Fig EXP2.a-6

Location of
adjustment
screw



BLACK MARK

ADJUSTMENT
SCREW WILL
BE BACKED
OUT 3 FULL
TURNS FOR
FIRST
ADJUSTMENT:
USE BLACK
MARK AS
GUIDE

MPS DOCUMENTATION

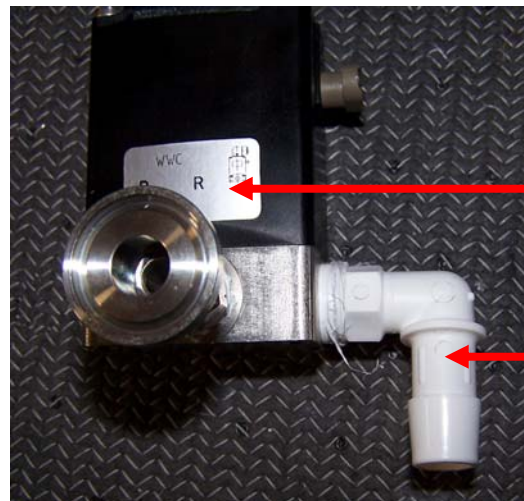
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Operation 40

4. Wrap elbow (M60-0044-04) with 4 wraps of teflon tape. Thread elbow into "R" port of three way valve, with the barb fitting facing away from the valve. Thread the adapter (PM0759) into the "A" port. Tighten each fitting with a 9/16" open end wrench. See fig EXP2.a-7

Fig EXP2.a-7

Adapter and elbow installed

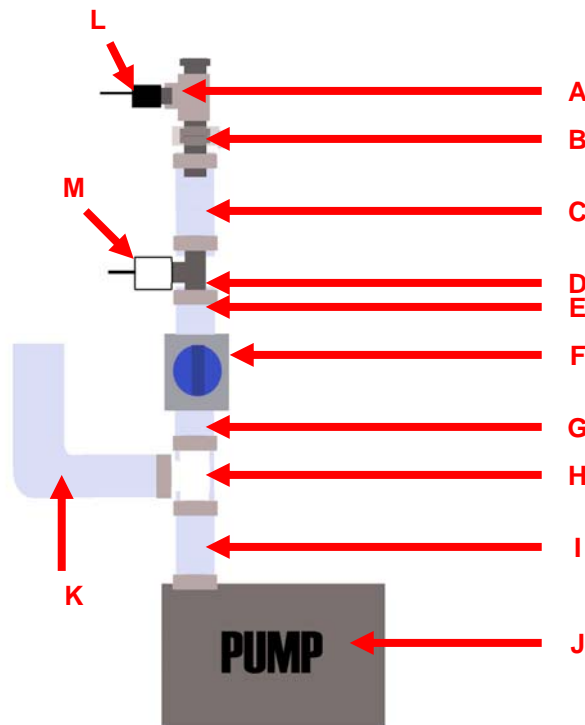


"R" PORT LABEL

ELBOW
(M60-0044-04)
WITH 4 WRAPS
OF TEFLON
TAPE

Fig EXP2.a-8

Diagram of Valve adjustment fixture setup



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Fig EXP2.a-9
Reference table
for valve
adjustment
fixture setup

LETTER	DESCRIPTION
A	TEE FITTING W/ 2 ADAPTERS & VAC GAUGE
B	CLAMP (PM0594) & GASKET (PM0595)
C	TUBING, 6"
D	TEE FITTING, METAL
E	TUBING, 8"
F	VALVE
G	TUBING, 7"
H	TEE FITTING, PLASTIC
I	TUBING, 7"
J	PUMP
K	TUBING, 15 ½"
L	VACUUM GAUGE, WHITE (COARSE ADJUSTMENT)
M	VACUUM GAUGE, BLACK (FINE ADJUSTMENT)

Operation 50

3. Connect adapter from "A" port on 3 way valve to "A" on fixture setup (see above table and diagram) with gasket (PM0595) and clamp (PM0594). Slide hose "K" (see above table and diagram) onto elbow barb on "R" port of 3 way valve. See fig EXP2.a-10.

Fig EXP2.a-10
Connecting the
3 way valve to
test fixture (P
side adjustment)



**TUBING
"K"**

**CLAMP
(PM0594)**

**GASKET
(PM0595)**

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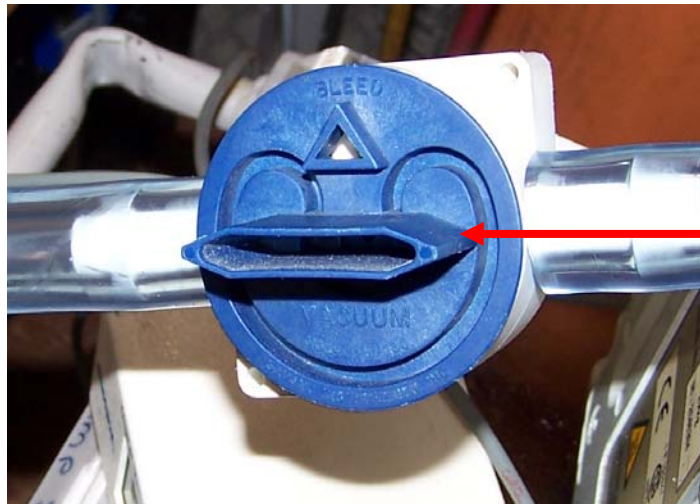
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Operation 60

- Turn on pump. Make sure that the blue valve ("F" in table) is closed. (See fig EXP2.a-11. Slowly turn adjustment screw of the "P" port on the 3-way valve until the white vacuum gauge reads "000" and the black gauge reads "029". See fig EXP2.a-12, 13. Adjustment of "P" port complete. Turn pump off, turn blue valve to vent, and remove 3-way valve from test setup.

Fig EXP2.a-11

Valve should be aligned with tubing to achieve vacuum



**THIS IS THE
CORRECT
ALIGNMENT FOR
VACUUM**

Fig EXP2.a-12

Adjust screw on "P" port in until gross measure (white vacuum gauge) reads 000



Fig EXP2.a-13

Adjust screw on "P" port in until fine measure (black vacuum gauge) reads 029



**ADJUST "P" SIDE
SCREW UNTIL
THIS GAUGE
READS "029"**

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Operation 70

1. Remove elbow from “R” port of 3-way valve, and thread into “P” port (re-taping may be needed). Engage the manual bypass by turning it closed (tight against the valve body). Connect elbow to “K” tubing (see diagram and table). Turn blue valve so vacuum can be achieved (see fig EXP2.a-11) and turn pump on. Turn screw in on “R” port so white gauge reads “000” and black reads “029”. Adjustment of “R” port complete. Turn off pump, open blue valve, and remove 3-way valve from test setup. Remove elbow from “P” port. Disengage manual bypass by turning it open. Adjustment of the 3-way valve complete.

Operation 80

1. Adjustment of the 2-way valve – Back out “P” side 3 full turns. Install elbow into “P” side. Connect elbow to “K” tubing (see diagram and table). Plug the open end of the “A” fitting (see diagram and table). Engage manual bypass. Turn blue valve to vacuum, and turn pump on. Turn “B” side screw out until white gauge does not read. Screw in “B” side until white gauge reads “000” and screw in small increments until black gauge reads “029” with a 1 second pause between gauge number drops. Turn off pump. Disengage bypass. Adjustment of the 2-way valve is complete.

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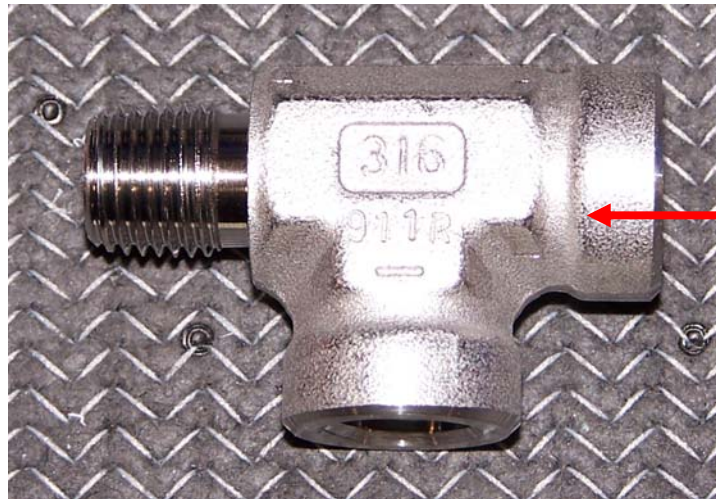
Operation 90

1. Wrap threads of tee (PM0752) with 4 wraps of teflon tape. Wrap threads of elbow (PM0741) with teflon tape. Thread elbow into tee (opposite end of threaded end). Wrap straight hose fitting (M60-0044-12) with 4 wraps of teflon tape. Thread straight hose fitting into top of tee. Tighten each connection with a 9/16" open end wrench. See fig EXP2.a-14 thru 18.

Fig EXP2.a-14

Tee

*Note: elbow is installed at opposite end of threaded end

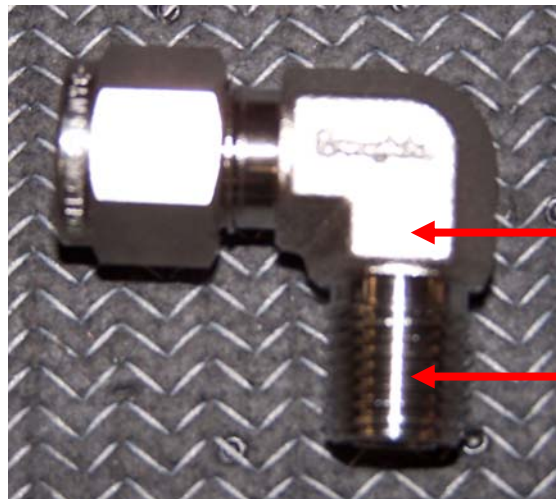


TEE
(PM0752)

Fig EXP2.a-15

Elbow

Threads get 4 wraps of teflon tape



ELBOW
(PM0741)

WRAP WITH
4 WRAPS OF
TEFLON
TAPE

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Fig EXP2.a-16

Straight hose fitting

*Threads get 4 wraps of teflon tape



**STRAIGHT
HOSE FITTING
(M60-0044-12)
WITH 4 WRAPS OF
TEFLON**

Fig EXP2.a-17

Thread elbow into tee, opposite threaded end of tee

* 4 wraps of teflon tape

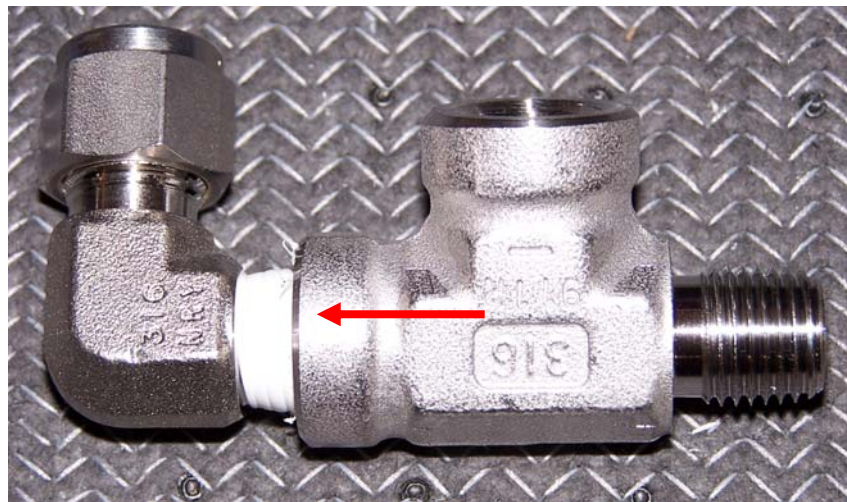
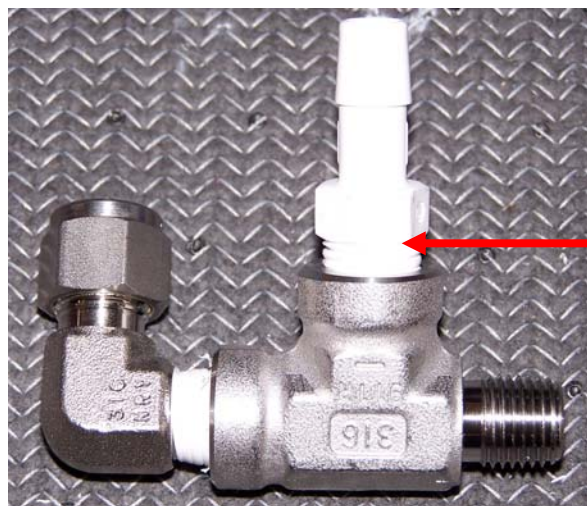


Fig EXP2.a-18

Thread straight hose fitting into top of tee

*4 Wraps of teflon tape



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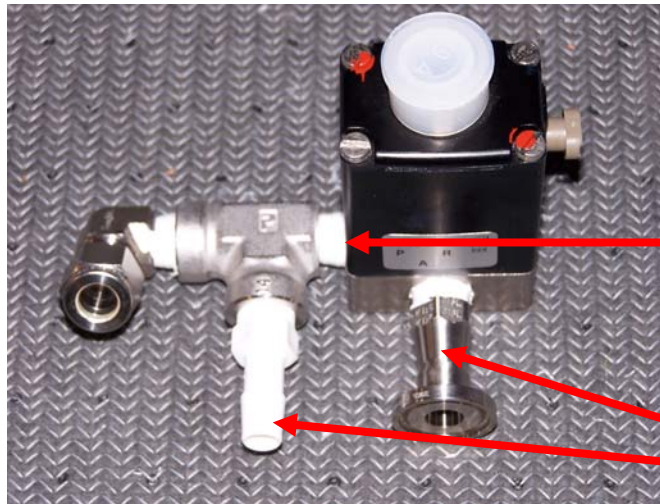
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Operation 100

1. Thread the threaded end of tee into the "P" port of the adjusted 3-way valve. Tighten with $\frac{3}{4}$ " open end wrench. Align the straight hose fitting and adapter from "A" port. Wrap threads of black plug (210-6140-00) with 4 wraps of teflon tape. Thread plug into the "B" port of the adjusted 3-way valve. Tighten with $\frac{9}{16}$ " open end wrench. See fig EXP2.a-19 thru 21.

Fig EXP2.a-19

Thread tee into
"P" port of
adjusted 3-way
valve



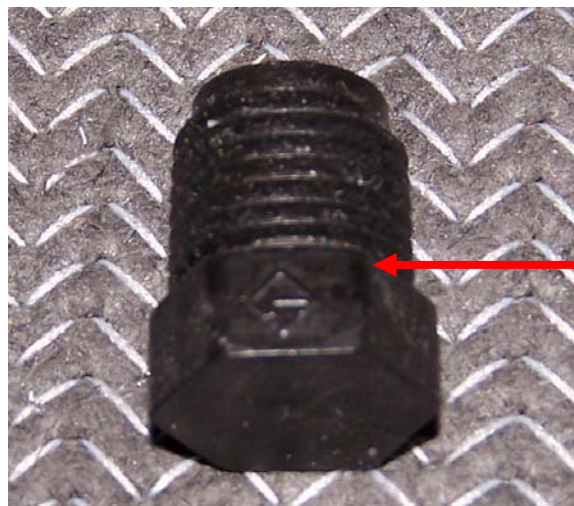
THREAD INTO
"P" PORT OF
ADJUSTED 3-
WAY VALVE

MAKE SURE
THESE LINE UP

Fig EXP2.a-20

Black Plug

*4 wraps of
teflon tape



BLACK PLUG
(210-6140-00)

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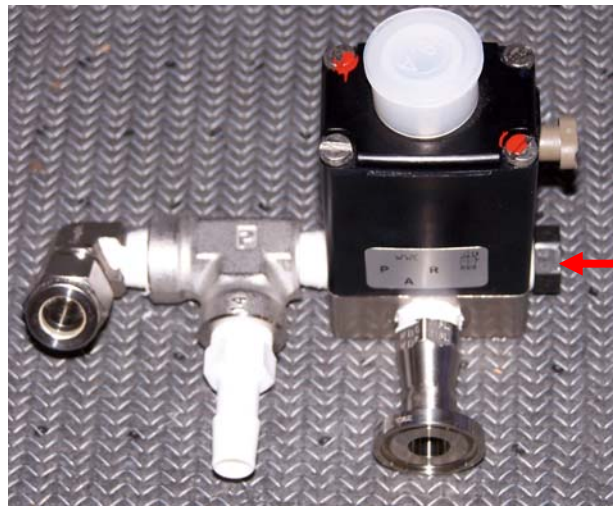
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Fig EXP2.a-21

Black plug
installed

*Tighten with
9/16" open end
wrench



Operation 110

1. Wrap a second straight hose fitting (M60-0044-12) with 4 wraps of teflon tape, and thread it into the "P" port (opposite of the manual bypass) of the adjusted 2-way valve. See fig EXP2.a-22. Attach the adjusted 3-way valve to the plate. Use 4 screws (PM0824), 4 flat washers (PM0065) and 4 lock washers (M10-0050-29). See fig EXP2.a-25. Cut a 3" piece of tubing (M30-0020-00) and press it onto the barbs of the straight hose fittings. Valve assembly is now complete.

Fig EXP2.a-22

Straight hose
fitting installed

*Opposite of
manual bypass,
4 wraps of
teflon tape &
tightened with
9/16" open end
wrench



**MANUAL
BYPASS**

**STRAIGHT
HOSE FITTING
(M60-0044-12)
WITH 4 WRAPS
OF TEFLON**

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Fig EXP2.a-23

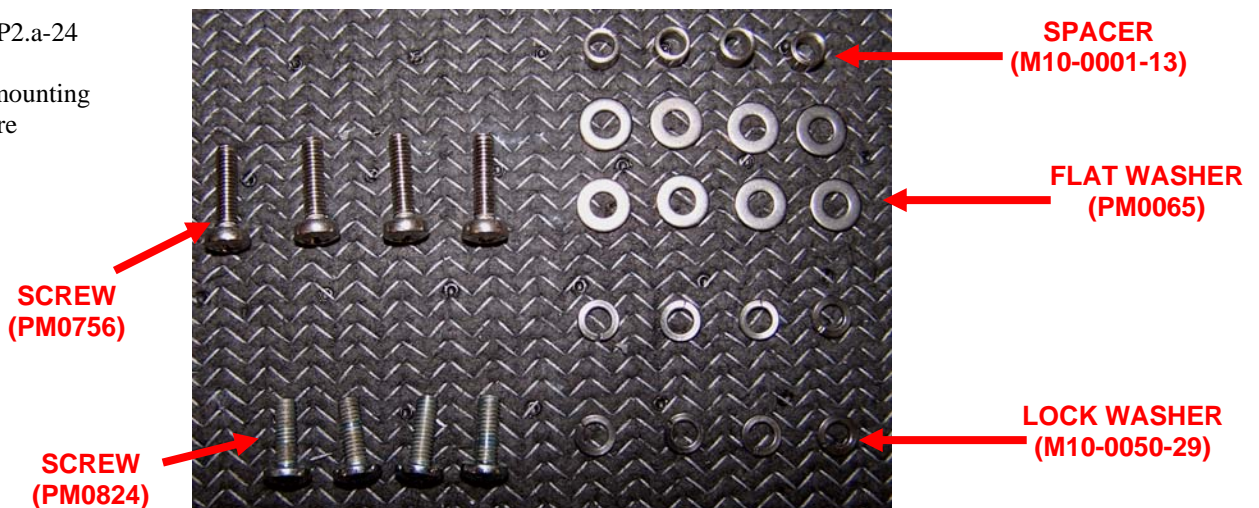
Valve mounting
plate



PLATE
(213-6255-00)

Fig EXP2.a-24

Valve mounting
hardware



Operation 120

1. Attach the adjusted 3-way valve to the plate. Use 4 screws (PM0824), 4 flat washers (PM0065) and 4 lock washers (M10-0050-29). See fig EXP2.a-25. Cut a 3" piece of tubing (M30-0020-00) and press it onto the barb of the straight hose fitting. See fig EXP2.a-26. Press the barb of the adjusted 2-way valve onto the other end of the tubing. See fig EXP2.a-27. Attach the adjusted 2-way valve to the plate. Use 4 screws (PM0824), 4 flat washers (PM0065) and 4 lock washers (M10-0050-29). See fig EXP2.a-28. Tighten elbow on the adjusted 3-way valve until it sits at roughly a 45 degree angle. See fig EXP2.a-29. Valve assembly is complete. See fig EXP2.a-30

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Fig EXP2.a-25

Adjusted 3-way
valve, mounted

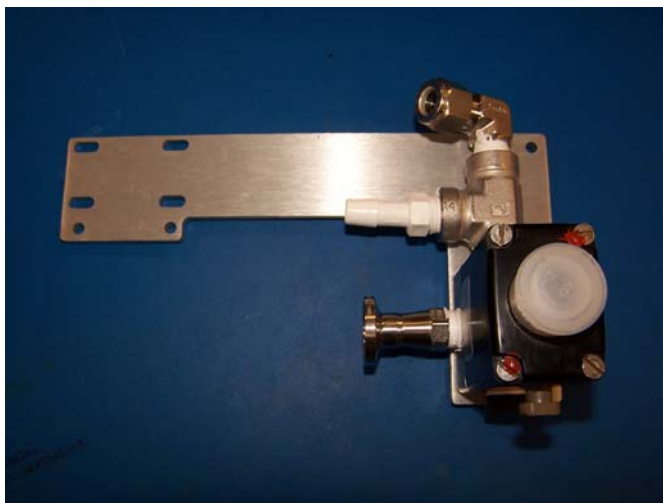


Fig EXP2.a-26

Cut a 3" piece
of tubing, and
press it onto the
barb of the
straight hose
fitting

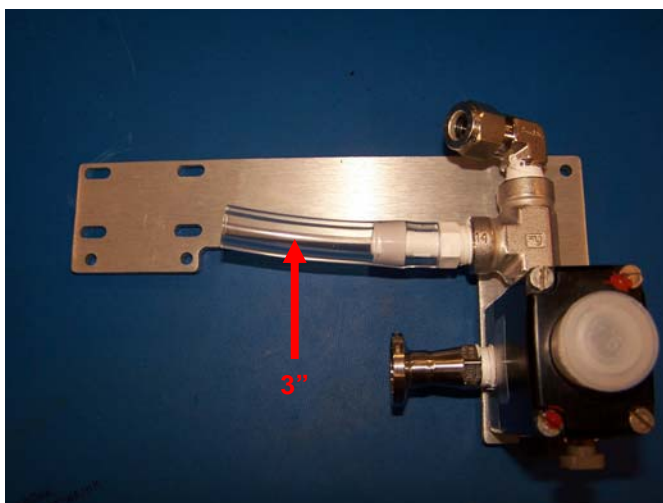
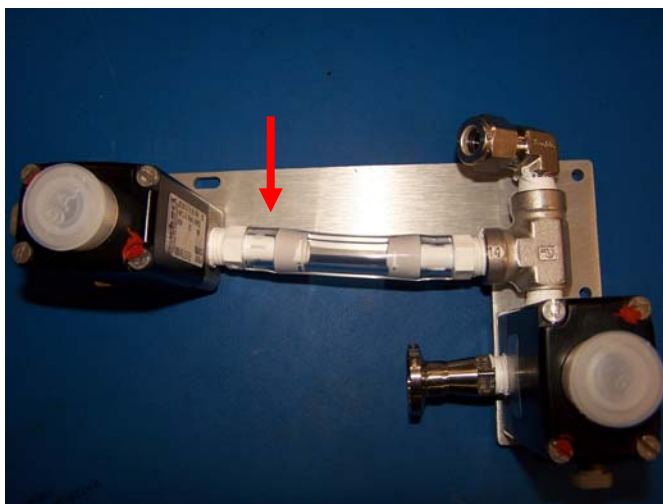


Fig EXP2.a-27

Press the
straight hose
fitting barb
from the
adjusted 2-way
valve onto the
other end of the
tubing



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Fig EXP2.a-28

Mounting the adjusted 2-way valve

(Showing hardware used)



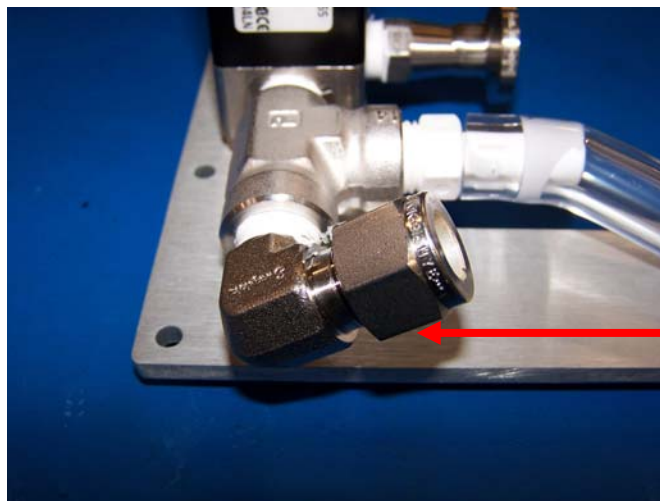
SCREW
(PM0824)

FLAT WASHER
(PM0065)

LOCK WASHER
(M10-0050-29)

Fig EXP2.a-29

Tighten elbow to approximate 45 degree angle



SHOULD BE
ABOUT 45°

Fig EXP2.a-30

Valve assembly, complete

