	<b>MAINTENANCE TRACKING TOOL</b>  <b>PETTRACE800</b>	Date:2023-09-28
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Country: Germany	Site: MUN
Intervention:	Programmed maintenance: UBM/CBM <input checked="" type="checkbox"/>
Subsystems:	

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**PRE-MAINTENANCE**

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Registration Date: 2023-09-20  
 Gas flow(sccm): 1.0

Gauge number	Pressure (x10-) without gas	Pressure (x10-) with gas
A1:	A1	A2
A2 Under Range:	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
A2:		
B1:	B1	B2

**TPG parameters**

	Low limit (x10-)	High limit (x10-)
A1 (4 on TCS 1001):	1.0	2.0
A2 (13 on TCS 1001):	3.0	4.0
B1 (14 on TCS 1001):	5.0	6.0

**Vacuum VENT time**


System software

Subsytem	Version
Master:	Master
ACS:	1
Service System:	2
Manager:	3
Informix (only applicable to SUN-Master Station):	4

Comments

comentario

Paper Burn Before PM

Pictures	
Image	Comments
	



**VACUUM**

**TPG settings verifications**

Date: 2023-09-20

Production gas flow: 5.0

Piranni 1 (TPG300 A1)

Pressure with gas	Low limit (x10-)	High limit
12.0	488.0	44578.0

Piranni 2 (TPG300 A2)

Under range	Pressure with gas	Low limit	High limit
<input checked="" type="checkbox"/>		123.0	3543.0

Penning

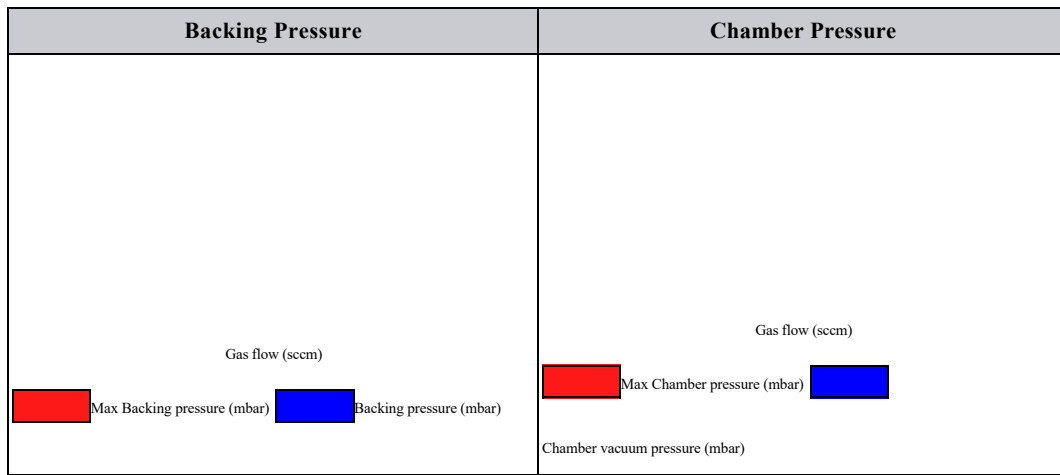
Pressure with gas	Low limit	High limit
12.0	45.0	12.0

Notes

notas

**Vacuum MFC curve test**

SCCM	Chamber pressure	Backing pressure
1	2.9E-6	0.012
2	5.4E-6	0.021
3	8.7E-6	0.027
4	1.2E-5	0.033
5	1.4E-5	0.041
6	1.6E-5	0.046
7	1.8E-5	0.051
8	2.0E-5	0.057
9	2.3E-5	0.063



### Vacuum leak test

Seconds since push standby	Chamber pressure	Max. Chamber pressure	Chamber Pressure
0	3.0E-8	1.80E-07	
10	1.9E-7	1.00E-06	
20	3.4E-7	1.50E-06	
30	5.0E-7	1.90E-06	
40	6.5E-7	2.30E-06	
50	9.2E-7	2.70E-06	
60	1.0E-6	3.00E-06	
70	1.2E-6	3.30E-06	
80	1.3E-6	3.60E-06	
90	1.4E-6	3.90E-06	
100	1.5E-6	4.20E-06	
110	1.6E-6	4.60E-06	

### Diffusion pump & HVV timing

TimeInto	HeatingTime	PumpingTimeBeforeOpenHVV	TimeToOpenHVV
Pump		15.0	

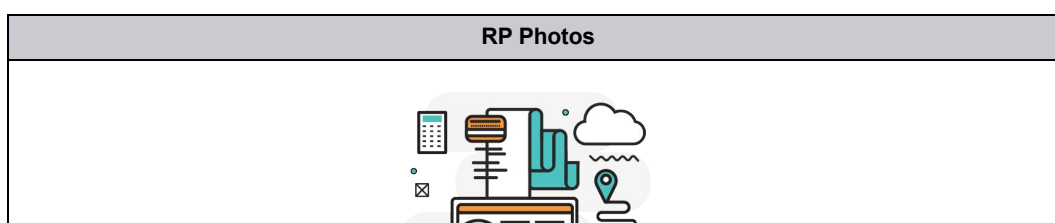
### RP & DP pump oil condition

Date last rotary oil change: 2023-08-31

Roughing pump oil mist filter cleaned	Roughing pump oil is in good color and condition
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

Last DP maintenance: 2023-08-31

DP oil is in good color and condition
<input checked="" type="checkbox"/>





**DP Photos**



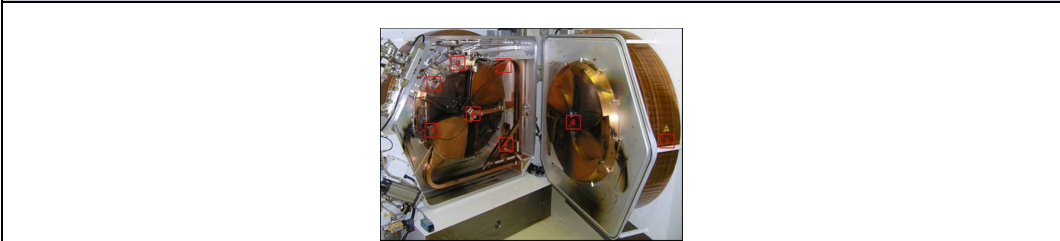
Notes

notas


**OtherTest**

<b>Name the test</b>	test
<b>Test explanation</b>	aqui se envia una foto o un video

**Photos or Videos**



**Add photos or videos**

<b>What media do you want to add</b>	Photo
	
<b>Name your media</b>	photo numero 1

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**CHAMBER**


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**Chamber Opening**

<b>Close target cooling water lines</b>	✓
<b>Visual inspection of door bolts and motor</b>	✓

Measure yoke play, adjust if needed: 1.0

Dose rate mapping (positions 1-9, [ $\mu$ Sv/h])	
Position1At36CmFromExtractionTrolley	12
Position2At36CmFromCarousel2	23
Position3At36CmFromDee2stemJunction	34
Position5At36CmFromCentralRegion	56

Photo documentation & visual inspection
<b>Magnet pole</b>


### Beam exit valve tests

Visual inspection of opening/closing	<input checked="" type="checkbox"/>
Visual inspection of tubing	<input checked="" type="checkbox"/>
Tubing replacement if needed	<input checked="" type="checkbox"/>

### Flaps

#### Flap 2

Calibrate flaps, record minimum and maximum motor current:

Minimum current [mA]	123
MaximumCurrentMA	123

Record flap to dee distances for 0%, 50%, 100%

0% value [mm]	1.0
50% value [mm]	2.0
100% value [mm]	2.0

### Central Region

Visual inspection of flip-in probe	<input checked="" type="checkbox"/>
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Measure flip-in probe position (a,b,c,d,e)

A [mm]	B [mm]	C [mm]	D [mm]	E [mm]
1.0	2.0	3.0	4.0	5.0

Dismount ion source and mount dummy ion source	<input checked="" type="checkbox"/>
------------------------------------------------	-------------------------------------

Measure central region distances (A, B, C, D) [mm]

A [mm]	B [mm]	C [mm]	D [mm]
6.0	7.0	8.0	9.0

Visual inspection and photo of H-puller	<input checked="" type="checkbox"/>
If needed: H-puller replacement	<input checked="" type="checkbox"/>



If needed: Adjustment of central region and record A, B, C, D again

If needed: Adjustment of central region and record A, B, C, D again		<input checked="" type="checkbox"/>	
A [mm]	B [mm]	C [mm]	D [mm]
1.0	2.0	3.0	4.0

If needed: Ion source maintenance or replacement	<input checked="" type="checkbox"/>
Install back ion source	<input checked="" type="checkbox"/>

Restore and record flip-in probe position

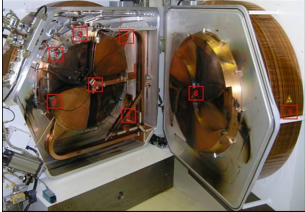
Restore and record flip-in probe position		<input checked="" type="checkbox"/>	
A [mm]	B [mm]	C [mm]	D [mm]
3.0	4.0	5.0	6.0

Pictures	
Image	Comments
	qqw
	qwe

### Dees

Visual inspection of dees, internal and external baffles	<input checked="" type="checkbox"/>
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	Measure dee thickness	Measure dee height
A	1.0	9.0
B	2.0	10.0
C	3.0	11.0
D	4.0	1.0
E	5.0	2.0
F	6.0	1.0
G	7.0	3.0
H	8.0	14.0

Pictures	
Image	Comments
	123

Verify tightness of dee- and stem screws	<input checked="" type="checkbox"/>
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### Extraction

Test each microswitch of extraction system	<input checked="" type="checkbox"/>
Replace extraction foils of carousels	<input checked="" type="checkbox"/>
Visual inspection of extraction cables	<input checked="" type="checkbox"/>

Calibrate balance, record minimum and maximum motor current [mA]

	Calibrate balance, record minimum and maximum motor current	Calibrate extraction 1, record minimum and maximum motor current [mA]	Calibrate extraction 2, record minimum and maximum motor current [mA]
Minimum current [mA]	1.0	3.0	5.0
Maximum current [mA]	2.0	4.0	6.0

### Diagnostic system checks

Visual inspection of collimators and collimator cables	<input checked="" type="checkbox"/>
Check collimator screws tightness	<input checked="" type="checkbox"/>

Check collimator vertical opening for each collimator pair	1.0
Check collimator vertical opening for each collimator pair	2.0
Measure flip-in probe resistance	3.0

	Resistance Measurement	Insulation Measurement
Extraction 1	4.0	5.0
Extraction 2	6.0	7.0

Targets	8.0
Comments	9

### Chamber Clean-up

Carousel repositioning

Reset foil counter	<input checked="" type="checkbox"/>
Install back carousels	<input checked="" type="checkbox"/>
Foil change test on each carousel	<input checked="" type="checkbox"/>

Full picture of vacuum chamber
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Chamber clean-up

<b>Regrease door o-ring</b>	✓
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## Cabinets

### Cabinets Swedwater

<b>Inspect cooling water system for leaks</b>	PSMC / RFPG water manifold, Swedewater cabinet
<b>If needed inspection of cooling water filters</b>	Inspect and clean Z1 filter

Record of water cooling system performance

<b>Record expansion vessel pressure BP1 [bar]</b>	1.0
<b>Record water level [mm]. Adjust if needed</b>	2.0
<b>Record main pump pressure BP2 [bar]</b>	3.0
<b>Record system temperature BT1 [°C]</b>	4.0
<b>Record temperature alarm setting [°C]</b>	5.0
<b>Record cooling water out temperature T2 [°C]</b>	6.0
<b>Record cooling water in temperature BT3 [°C]</b>	7.0
<b>Record deionizer flow BF10 [l/min]</b>	8.0
<b>Record conductivity BQ1[μS/cm]</b>	9.0
<b>Replace deionizer vessel if needed</b>	✓

### Cabinets RFPG

RFPG general tasks

<b>Switch off power to RFPG, log out &amp; tag out</b>	<b>Replace the RFPG air inlet filters, clean the front grid cover, inspect the grid of the back of the cabinet, clean if required</b>
✓	✓

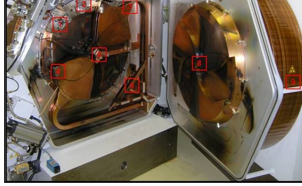
TAU inspection

<b>TAU inspection</b>	Verify that no burn marks, loose cables, or water leaks are present
<b>Repair and/or replace as required</b>	repair

Take photos (upper and lower compartment)







GSPU inspection

<b>Verify that no burn marks or loose cables are present</b>	<input checked="" type="checkbox"/>
<b>Clean</b>	<input checked="" type="checkbox"/>

<b>Repair and/or replace as required</b>
replace

Take photos



DPA inspection

<b>Verify that no burn marks, loose cables, or water leaks are present</b>	<input checked="" type="checkbox"/>
<b>Clean</b>	<input checked="" type="checkbox"/>

<b>Repair and/or replace as required</b>
replace

Take photos



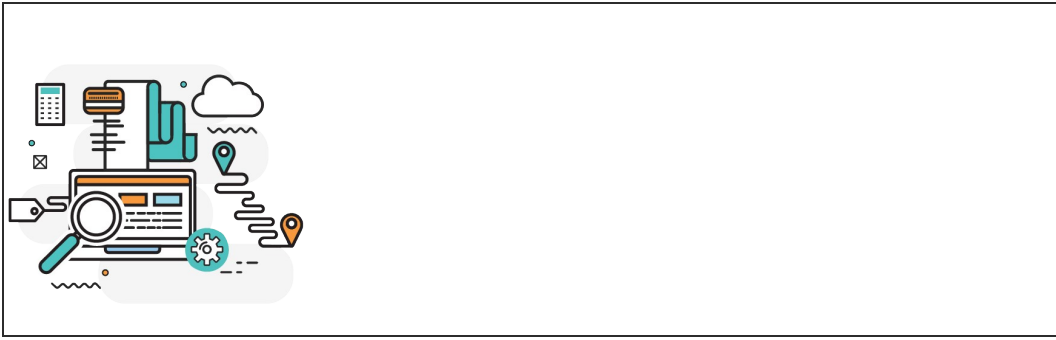
TPSU back side inspection

<b>Record the resistance of the earth stick</b>	5.0
<b>TPSU back side inspection</b>	Verify that no burn marks, loose cables, or water leaks are present

<b>Repair and/or replace as required</b>
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replace

Take photos



<b>Remove earth stick</b>	<input checked="" type="checkbox"/>
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TPSU front side inspection

<b>TPSU front side inspection</b>	Clean
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<b>Repair and/or replace as required</b>
repair

Take photos



RFPG live tests

Record RFPG water cooling pressure	Switch on RFPG main power	Record DPSU voltage [V]	Record DPSU ripple [mV rms]
1.0	<input checked="" type="checkbox"/>	2.0	3.0

Record voltages on phase load detector board (SCU)

3V [V]	TP1 +15V [V]	TP2 -15V [V]	TP3 +5V [V]	TP4 +24V [V]
4.0	5.0	6.0	7.0	8.0

Record ripple on phase load detector board (SCU)

3V [V rms]	TP1 +15V [V rms]	TP2 -15V [V rms]	TP3 +5V [V rms]	TP4 +24V [V rms]
9.0	10.0	11.0	12.0	13.0

<b>Turn on Magnet to set value</b>	<input checked="" type="checkbox"/>
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Record RF parameters in off mode

From SCU Webpage:

DEE voltage ref [V]	999.0
DEE voltage read 1 [V]	14.0
DEE voltage read 2 [V]	15.0
RF fwd voltage [Vrms]	16.0
RF reflected voltage [Vrms]	17.0
DPA RF FWD voltage [Vrms]	18.0
FWD power [kW]	19.0
Reflected power [kW]	20.0
Anode voltage [kV]	21.0
Anode current [A]	72.0
Grid voltage [V]	23.0
Grid current [A]	24.0
Screen voltage [V]	25.0
Screen current [mA]	26.0
Heater voltage [V rms]	27.0

From PSS:

DEE voltage set [kV]	28.0
DEE voltage read [kV]	29.0
Delta DEE voltage set [kv]	30.0
Delta DEE voltage read [kV]	31.0
FWD power [kW]	32.0
Reflected power [kW]	33.0
Flap I start [%]	34.0
Flap I position [%]	35.0
Flap II start [%]	36.0
Flap II position [%]	37.0

Record RF parameters in standby mode

From SCU Webpage:

DEE voltage ref [V]	38.0
DEE voltage read 1 [V]	39.0
DEE voltage read 2 [V]	40.0
DRF fwd voltage [Vrms]	41.0
RF reflected voltage [Vrms]	42.0
DPA RF FWD voltage [Vrms]	43.0
FWD power [kW]	44.0
Reflected power [kW]	45.0
Anode voltage [kV]	46.0
Anode current [A]	47.0
Grid voltage [V]	48.0
Grid current [A]	49.0
Screen voltage [V]	50.0
Screen current [mA]	51.0

Heater voltage [V rms]	52.0
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From PSS:

DEE voltage set [kV]	53.0
DEE voltage read [kV]	54.0
Delta DEE voltage set [kv]	55.0
Delta DEE voltage read [kV]	56.0
FWD power [kV]	57.0
Reflected power [kV]	58.0
Flap I start [%]	59.0
Flap I position [%]	60.0
Flap II start [%]	61.0
Flap II position [%]	62.0
Soft-start RFPG. Start from 25kV / 0kV, ramp up with 1kV / 10s to config value	<input checked="" type="checkbox"/>

Record RF parameters in on mode

From SCU Webpage:

DEE voltage ref [V]	63.0
DEE voltage read 1 [V]	64.0
DEE voltage read 2 [V]	65.0
RF fwd voltage [Vrms]	66.0
RF reflected voltage [Vrms]	67.0
DPA RF FWD voltage [Vrms]	68.0
FWD power [kW]	69.0
Reflected power [kW]	70.0
Anode voltage [kV]	71.0
Anode current [A]	72.0
Grid voltage [V]	73.0
Grid current [A]	74.0
Screen voltage [V]	75.0
Screen current [mA]	76.0
Heater voltage [V rms]	77.0

From PSS:

DEE voltage set [kV]	78.0
DEE voltage read [kV]	79.0
Delta DEE voltage set [kv]	80.0
Delta DEE voltage read [kV]	81.0
FWD power [kV]	82.0
Reflected power [kV]	83.0
Flap I start [%]	84.0
Flap I position [%]	85.0
Flap II start [%]	86.0
Flap II position [%]	87.0

Let the system run for approximately 1-2 hours, monitor parameters, record fastlog, five second log and statistic log, download the SCU logs.	88
Upload files	gridfs://registrationFiles/68496b7d-edab-48c1-adeb-5048498d13d1

Record RF parameters in on mode again

From SCU Webpage:

DEE voltage ref [V]	89.0
DEE voltage read 1 [V]	90.0
DEE voltage read 2 [V]	91.0
RF fwd voltage [Vrms]	92.0
RF reflected voltage [Vrms]	93.0
DPA RF FWD voltage [Vrms]	94.0
FWD power [kW]	95.0
Reflected power [kW]	96.0
Anode voltage [kV]	97.0
Anode current [A]	98.0
Grid voltage [V]	99.0
Grid current [A]	100.0
Screen voltage [V]	101.0
Screen current [mA]	102.0
Heater voltage [V rms]	103.0

From PSS:

DEE voltage set [kV]	104.0
DEE voltage read [kV]	105.0
Delta DEE voltage set [kv]	106.0
Delta DEE voltage read [kV]	107.0
FWD power [kW]	108.0
Reflected power [kW]	109.0
Flap I start [%]	110.0
Flap I position [%]	111.0
Flap II start [%]	112.0
Flap II position [%]	113.0
Turn RFPG off	<input checked="" type="checkbox"/>

### Cabinets PSMC

PSMC
Inspect for water leaks, burn marks and broken parts

Verify the resistance values with the installation tester

Resistance between negative and positive [ $\Omega$ ]	Resistance between negative and ground [ $M\Omega$ ]	Resistance between positive and ground [ $M\Omega$ ]
1.0	2.0	3.0

Lookup
Install back all covers, Verify fan functionality, Verify interlock functionality

Record on sequence ramping speed	Record on sequence ramping up time to maximum	Record on sequence ramping up time to configuration value
4.0	5.0	6.0

Verify PSMC performance for H-config value

Set current	7.0
Output current [A]	8.0
Voltage read PSS [V]	9.0
Coil voltage [V]	10.0
Firing sequence [number of peaks in 20ms]	11.0
Ripple [mV rms]	12.0

Verify PSMC performance for 499A

Set current	13.0
Output current [A]	14.0
Voltage read PSS [V]	15.0
Coil voltage [V]	16.0
Firing sequence [number of peaks in 20ms]	17.0
Ripple [mV rms]	18.0

Verify PSMC performance for 250A

Set current	19.0
Output current [A]	20.0
Voltage read PSS [V]	21.0
Coil voltage [V]	212.0
Firing sequence [number of peaks in 20ms]	23.0
Ripple [mV rms]	24.0

Verify PSMC performance for 50A

Set current	25.0
Output current [A]	26.0
Voltage read PSS [V]	278.0
Coil voltage [V]	28.0
Firing sequence [number of peaks in 20ms]	29.0
Ripple [mV rms]	30.0

Turn off PSMC and measure off sequence ramping down time	✓
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**Cabinets ACU**

Record ACU voltages GND_IO / 24	Record ACU voltages GND_IO / +15V	Record ACU voltages GND_IO / -15V	Record ACU voltages GND / +5V	Record ACU voltages Chassis / GND_IO
9.0	8.0	7.0	6.0	5.0

Record H2 gas pressure

Set point [bar]	Reading at MFC [bar]
1.0	2.0

Turn on Magnet, set probe in, turn on RF, turn on gas.

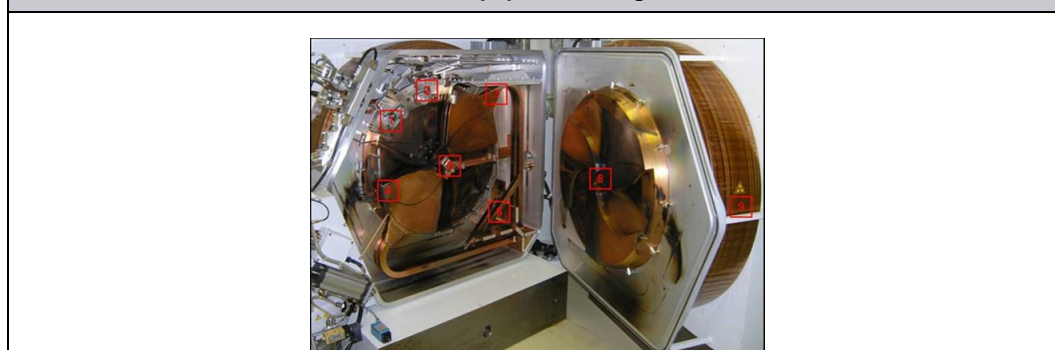
Magnet current [A]	DEE1 voltage [kV]	DEE2 voltage [kV]	Gas flow [sccm]	If ion source was maintained, perform ion source conditioning (ramp up from 30 mA to 100 mA in 30 minutes and from 100mA to 200mA in 10 minutes)
3.0	4.0	5.0	6.0	<input checked="" type="checkbox"/>

**Record Ion Source Performance**

IS current [mA]	IS voltage [V]	Flip in probe current [µA]
9.0	5.0	1.0

**Paper Burn Test**

Install paper burn target	<input checked="" type="checkbox"/>
Perform paper burn test in SB and DB	<input checked="" type="checkbox"/>

**Install paper burn target**


If needed, adjust collimators and repeat	asd
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**LTF**

LTF	If needed, replace LTF peek lines and connectors
Inspect the movement of all LTF compressed air actuators	V3

Starting pressure [psi]	Pressure drop [psi / h]
7.0	5.0

If needed: Perform target fill tests and adjustment for each target	3.0
If needed, adjust and repeat test, record adjustment value	0.0

Pictures	
Image	Comments
	asd

### Autoshield

Check compressor oil level and operational hours	12.0
Autoshield	Manually drain the the air tank and the air manifold to evacuate condensated water,Verify the air tank relief valve operation, repair/replace as required
Verify tank water level and float switches functionality, top up water level/repair and/or replace switches as required	✓
Verify functionality of micro switches for: Door closed	✓
Read and record door lift timing for left door	12.0
Read and record door lift timing for right door	4.0
Verify functionality of skirt microswitches and that the skirts seats properly on the micro switches	✓
Verify tightening of the upper and the lower socket heads screws	✓

### Autoshield Upper

Read and record upper manometer lifting pressures



K1	K2	K3	K4	K5	K6
9.0	8.0	7.0	6.0	5.0	4.0

### Autoshield Lower

Read and record lower manometer lifting pressures

K1	K2	K3	K4	K5	K6
0.0	1.0	2.0	3.0	4.0	5.0



Pictures	
Image	Comments
	q
	23