

HTS Leads Installation Reports



FERMILAB
Technical
Division

7500 A HTS Power Leads for the
LHC DFBX:
Installation of the Current Leads

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Box "D"



FERMILAB
Technical Division

Installation of the LHC HTS Current Leads

Lead: DFLX 09

Pos. 1

Signed Wayne E. Johnson

Date 1-7-05



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7500 A HTS Power Leads for the
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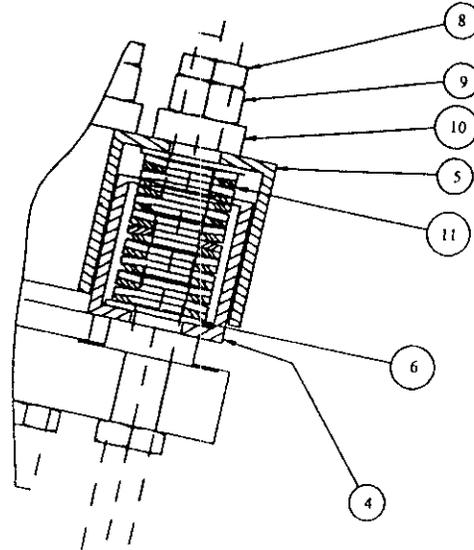


Figure 1.31b An installed Belleville washer assembly.

- 1.29 Tighten the 6 Belleville washer assemblies to apply load to the PEEK seal.
- 1.29.1 Back down the tensioning rod nuts used in Step 1.25 so they are about 5 mm below the power lead flange.
- 1.29.2 Tighten the 6 loading nuts finger-tight. With adjustable parallels, measure and record the gap 'y' indicated in Figure 1.31a between Item 5 (Belleville washer holder upper half) and the power lead top flange at the 6 locations specified in Figure 1.32.2. Units are mm.

A 18.07 B 17.31 C 17.09 D 17.84 E 17.45 F 17.07

- 1.29.3 For each of the six studs: remove the adjustable parallel, adjust it for 1.8 mm of compression, and return the adjustable parallel into position under the Belleville washer holder. Record the adjusted heights of the adjustable parallels. Units are mm.

A 16.27 B 15.51 C 15.29 D 16.04 E 15.65 F 15.27

- 1.29.4 Using the sequence A through F in Figure 1.32.2, sequentially tighten the loading nuts ¼ turn until the total compression is 1.8 mm at each of the six locations. As each loading nut is tightened ¼ turn, check off the appropriate line.

A ✓ B ✓ C ✓ D ✓ E ✓ F ✓
A ✓ B ✓ C ✓ D ✓ E ✓ F ✓

Lead DFLX _____



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A B C D E F
 A B C D E F
 A B C D E F
 A B C D E F
 A B C D E F
 A B C D E F

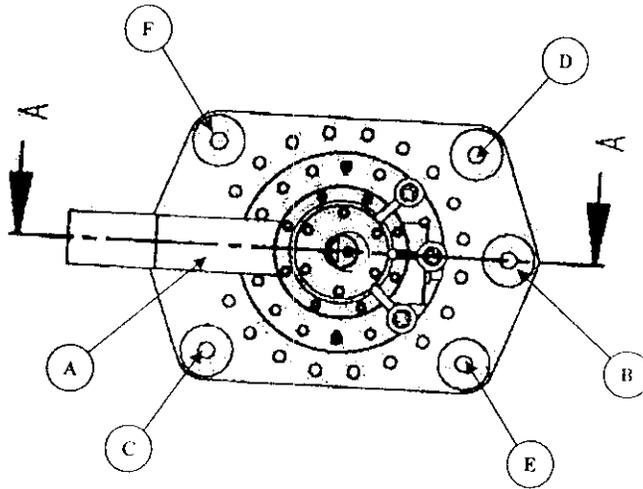


Figure 1.32.2 The specified sequence for tightening the Belleville washer assemblies.

1.29.5 Remove the adjustable parallels from under each Belleville washer assembly, then replace them and measure the final gaps 'y' in Figure 1.31a. Units are mm.

A 16.22 B 15.69 C 15.38 D 15.97 E 15.47 F 15.00

1.29.6 Attach a Conflat flange with a pressure gauge and a fill valve to the gas outlet port. Pressurize to 10 psig. The seal is acceptable if the pressure loss is less than 1 psi after 2 minutes.

1.30 Reduce compression of Belleville washer assemblies.

1.30.1 Remove the Teflon centering ring from the installed power lead.

1.30.2 Back off the loading nuts sequentially to reduce the Belleville compression to 0.75 mm (0.030 in).

1.31 Tighten down the jam nuts to secure the loading nuts on the installed Belleville washer assemblies.

Lead DFLX _____



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Box "D"



FERMILAB
Technical Division

Installation of the LHC HTS Current Leads

Lead: DFLX 09

FLANGE STAMPED 40

Pos. 1

Signed

Wayne E. John

Date

11-16-04



7500 A HTS Power Leads for the LHC DFBX: Installation of the Current Leads at Meyer Tool & Manufacturing

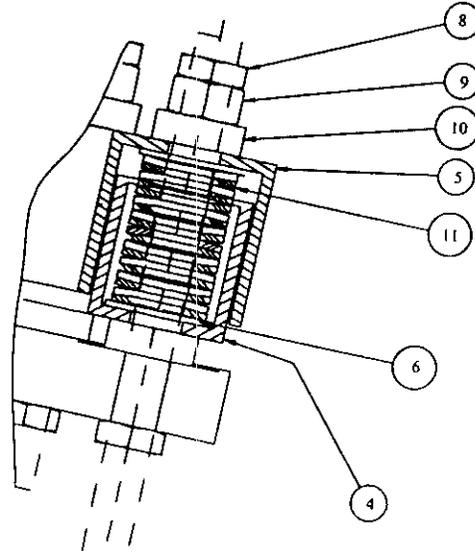


Figure 1.31b An installed Belleville washer assembly.

- 1.29 Tighten the 6 Belleville washer assemblies to apply load to the PEEK seal.
- 1.29.1 Back down the tensioning rod nuts used in Step 1.25 so they are about 5 mm below the power lead flange.
- 1.29.2 Tighten the 6 loading nuts finger-tight. With adjustable parallels, measure and record the gap 'y' indicated in Figure 1.31a between Item 5 (Belleville washer holder upper half) and the power lead top flange at the 6 locations specified in Figure 1.32.2. Units are mm.

A 17.43 B 17.26 C 16.95 D 17.32 E 17.27 F 16.99

- 1.29.3 For each of the six studs: remove the adjustable parallel, adjust it for 1.8 mm of compression, and return the adjustable parallel into position under the Belleville washer holder. Record the adjusted heights of the adjustable parallels. Units are mm.

A 15.63 B 15.46 C 15.15 D 15.52 E 15.47 F 15.19

- 1.29.4 Using the sequence A through F in Figure 1.32.2, sequentially tighten the loading nuts 1/4 turn until the total compression is 1.8 mm at each of the six locations. As each loading nut is tightened 1/4 turn, check off the appropriate line.

A ✓ B ✓ C ✓ D ✓ E ✓ F ✓

A ✓ B ✓ C ✓ D ✓ E ✓ F ✓



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A ✓ B ✓ C ✓ D ✓ E ✓ F ✓
 A ✓ B ✓ C ✓ D ✓ E ✓ F ✓
 A ✓ B ✓ C ✓ D ✓ E ✓ F ✓
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 A ✓ B ✓ C ✓ D ✓ E ✓ F ✓
 A B C D E F

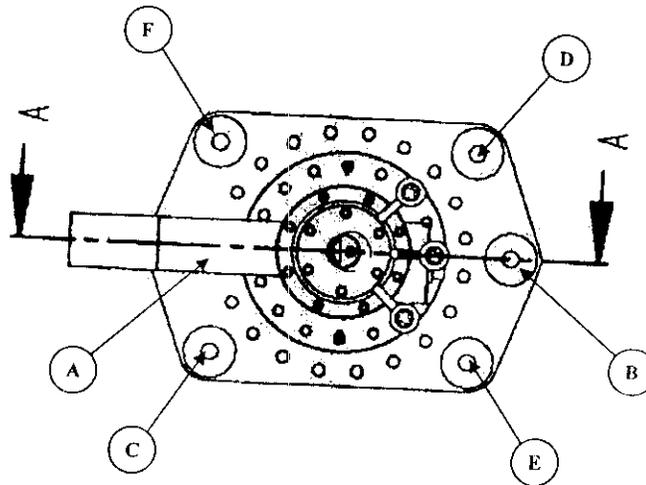


Figure 1.32.2 The specified sequence for tightening the Belleville washer assemblies.

1.29.5 Remove the adjustable parallels from under each Belleville washer assembly, then replace them and measure the final gaps 'y' in Figure 1.31a. Units are mm.

A 15.68 B 15.94 C 15.24 D 15.75 E 15.60 F 15.21

1.29.6 Attach a Conflat flange with a pressure gauge and a fill valve to the gas outlet port. Pressurize to 10 psig. The seal is acceptable if the pressure loss is less than 1 psi after 2 minutes.

1.30 Reduce compression of Belleville washer assemblies.

1.30.1 Remove the Teflon centering ring from the installed power lead.

1.30.2 Back off the loading nuts sequentially to reduce the Belleville compression to 0.75 mm (0.030 in).

1.31 Tighten down the jam nuts to secure the loading nuts on the installed Belleville washer assemblies.



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Box "D"



FERMILAB
Technical Division

Installation of the LHC HTS Current Leads

Lead: DFLX 06

Pos. 2

Signed Wayne E. Johnson

Date 1-7-05



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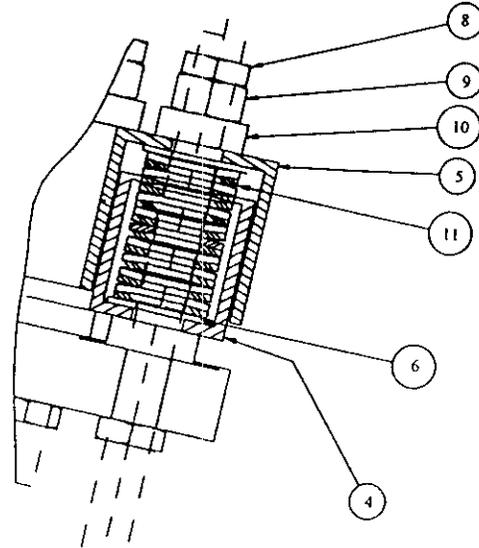


Figure 1.31b An installed Belleville washer assembly.

- 1.29 Tighten the 6 Belleville washer assemblies to apply load to the PEEK seal.
- 1.29.1 Back down the tensioning rod nuts used in Step 1.25 so they are about 5 mm below the power lead flange.
- 1.29.2 Tighten the 6 loading nuts finger-tight. With adjustable parallels, measure and record the gap 'y' indicated in Figure 1.31a between Item 5 (Belleville washer holder upper half) and the power lead top flange at the 6 locations specified in Figure 1.32.2. Units are mm.

A 16.66 B 17.20 C 16.49 D 17.56 E 17.29 F 16.57

- 1.29.3 For each of the six studs: remove the adjustable parallel, adjust it for 1.8 mm of compression, and return the adjustable parallel into position under the Belleville washer holder. Record the adjusted heights of the adjustable parallels. Units are mm.

A 14.86 B 15.40 C 14.69 D 15.76 E 15.49 F 14.77

- 1.29.4 Using the sequence A through F in Figure 1.32.2, sequentially tighten the loading nuts ¼ turn until the total compression is 1.8 mm at each of the six locations. As each loading nut is tightened ¼ turn, check off the appropriate line.

A ✓ B ✓ C ✓ D ✓ E ✓ F ✓

A ✓ B ✓ C ✓ D ✓ E ✓ F ✓



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A B C D E F
 A B C D E F
 A B C D E F
 A B C D E F
 A B C D E F
 A B C D E F

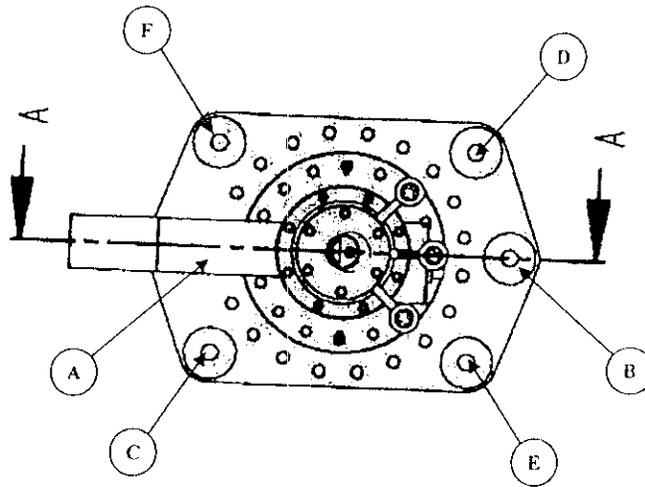


Figure 1.32.2 The specified sequence for tightening the Belleville washer assemblies.

1.29.5 Remove the adjustable parallels from under each Belleville washer assembly, then replace them and measure the final gaps 'y' in Figure 1.31a. Units are mm.

A 15.17 B 15.82 C 14.97 D 16.05 E 15.51 F 14.71

1.29.6 Attach a Conflat flange with a pressure gauge and a fill valve to the gas outlet port. Pressurize to 10 psig. The seal is acceptable if the pressure loss is less than 1 psi after 2 minutes.

1.30 Reduce compression of Belleville washer assemblies.

1.30.1 Remove the Teflon centering ring from the installed power lead.

1.30.2 Back off the loading nuts sequentially to reduce the Belleville compression to 0.75 mm (0.030 in).

1.31 Tighten down the jam nuts to secure the loading nuts on the installed Belleville washer assemblies.

Lead DFLX _____



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Box "D"



FERMILAB
Technical Division

Installation of the LHC HTS Current Leads

Lead: DFLX 06

FLANGE STAMPED 27

Pos. 2

Signed

Wayne E. Johnson

Date

7-10-04



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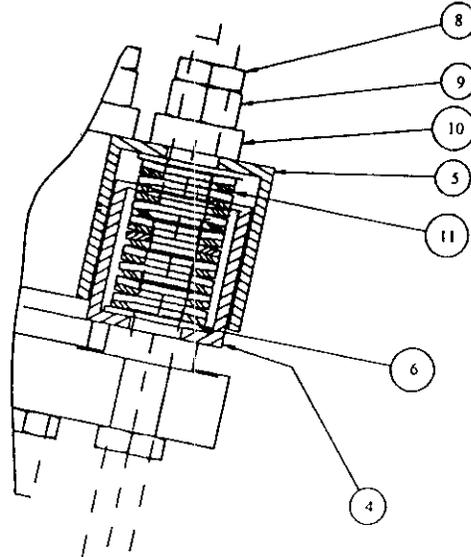


Figure 1.31b An installed Belleville washer assembly.

- 1.29 Tighten the 6 Belleville washer assemblies to apply load to the PEEK seal.
- 1.29.1 Back down the tensioning rod nuts used in Step 1.25 so they are about 5 mm below the power lead flange.
- 1.29.2 Tighten the 6 loading nuts finger-tight. With adjustable parallels, measure and record the gap 'y' indicated in Figure 1.31a between Item 5 (Belleville washer holder upper half) and the power lead top flange at the 6 locations specified in Figure 1.32.2. Units are mm.

A 16.90 B 17.12 C 16.80 D 17.28 E 16.96 F 16.91

- 1.29.3 For each of the six studs: remove the adjustable parallel, adjust it for 1.8 mm of compression, and return the adjustable parallel into position under the Belleville washer holder. Record the adjusted heights of the adjustable parallels. Units are mm.

A 15.10 B 15.32 C 15.00 D 15.48 E 15.16 F 15.11

- 1.29.4 Using the sequence A through F in Figure 1.32.2, sequentially tighten the loading nuts ¼ turn until the total compression is 1.8 mm at each of the six locations. As each loading nut is tightened ¼ turn, check off the appropriate line.

A	<input checked="" type="checkbox"/>	B	<input checked="" type="checkbox"/>	C	<input checked="" type="checkbox"/>	D	<input checked="" type="checkbox"/>	E	<input checked="" type="checkbox"/>	F	<input checked="" type="checkbox"/>
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A B C D E F
 A B C D E F
 A B C D E F
 A B C D E F
 A _____ B _____ C _____ D _____ E _____ F _____
 A _____ B _____ C _____ D _____ E _____ F _____

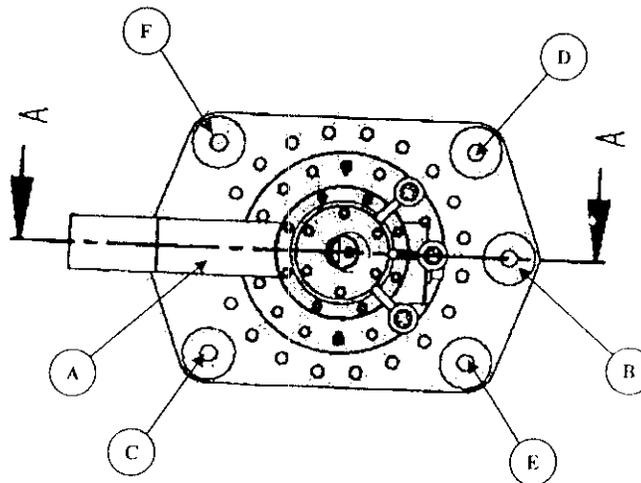


Figure 1.32.2 The specified sequence for tightening the Belleville washer assemblies.

1.29.5 Remove the adjustable parallels from under each Belleville washer assembly, then replace them and measure the final gaps 'y' in Figure 1.31a. Units are mm.

A 14.70 B 15.43 C 14.98 D 15.67 E 15.21 F 14.70

1.29.6 Attach a Conflat flange with a pressure gauge and a fill valve to the gas outlet port. Pressurize to 10 psig. The seal is acceptable if the pressure loss is less than 1 psi after 2 minutes.

1.30 Reduce compression of Belleville washer assemblies.

1.30.1 Remove the Teflon centering ring from the installed power lead.

1.30.2 Back off the loading nuts sequentially to reduce the Belleville compression to 0.75 mm (0.030 in).

1.31 Tighten down the jam nuts to secure the loading nuts on the installed Belleville washer assemblies.

Lead DFLX _____



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Box "D"



FERMILAB
Technical Division

Installation of the LHC HTS Current Leads

Lead: DFLX 15

Pos. 3

Signed Wayne E. Johnson

Date 1-7-05



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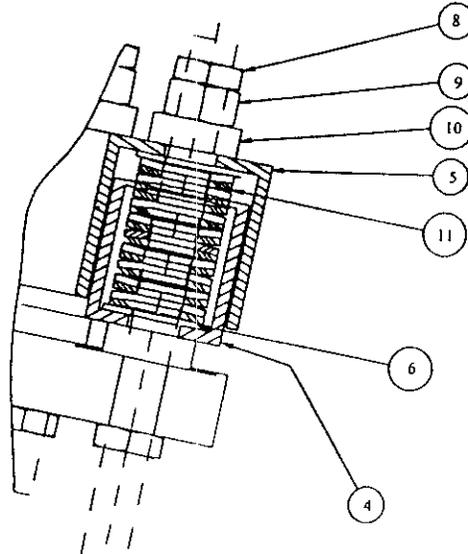


Figure 1.31b An installed Belleville washer assembly.

- 1.29 Tighten the 6 Belleville washer assemblies to apply load to the PEEK seal.
- 1.29.1 Back down the tensioning rod nuts used in Step 1.25 so they are about 5 mm below the power lead flange.
- 1.29.2 Tighten the 6 loading nuts finger-tight. With adjustable parallels, measure and record the gap 'y' indicated in Figure 1.31a between Item 5 (Belleville washer holder upper half) and the power lead top flange at the 6 locations specified in Figure 1.32.2. Units are mm.

A 16.70 B 17.12 C 16.67 D 17.47 E 17.53 F 17.31

- 1.29.3 For each of the six studs: remove the adjustable parallel, adjust it for 1.8 mm of compression, and return the adjustable parallel into position under the Belleville washer holder. Record the adjusted heights of the adjustable parallels. Units are mm.

A 14.90 B 15.32 C 14.87 D 15.67 E 15.73 F 15.51

- 1.29.4 Using the sequence A through F in Figure 1.32.2, sequentially tighten the loading nuts ¼ turn until the total compression is 1.8 mm at each of the six locations. As each loading nut is tightened ¼ turn, check off the appropriate line.

A ✓ B ✓ C ✓ D ✓ E ✓ F ✓

A ✓ B ✓ C ✓ D ✓ E ✓ F ✓

Lead DFLX _____



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A ✓ B ✓ C ✓ D ✓ E ✓ F ✓
 A ✓ B ✓ C ✓ D ✓ E ✓ F ✓
 A ✓ B ✓ C ✓ D ✓ E ✓ F ✓
 A ✓ B ✓ C D ✓ E F ✓
 A B C D ✓ E F ✓
 A B C D E F

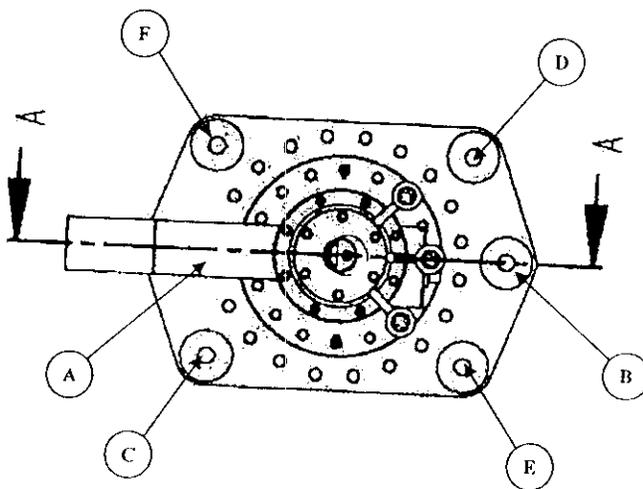


Figure 1.32.2 The specified sequence for tightening the Belleville washer assemblies.

1.29.5 Remove the adjustable parallels from under each Belleville washer assembly, then replace them and measure the final gaps 'y' in Figure 1.31a. Units are mm.

A 15.00 B 15.53 C 14.43 D 15.55 E 15.98 F 15.82

1.29.6 Attach a Conflat flange with a pressure gauge and a fill valve to the gas outlet port. Pressurize to 10 psig. The seal is acceptable if the pressure loss is less than 1 psi after 2 minutes.

1.30 Reduce compression of Belleville washer assemblies.

1.30.1 Remove the Teflon centering ring from the installed power lead.

1.30.2 Back off the loading nuts sequentially to reduce the Belleville compression to 0.75 mm (0.030 in).

1.31 Tighten down the jam nuts to secure the loading nuts on the installed Belleville washer assemblies.



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Box "D"



FERMILAB
Technical Division

Installation of the LHC HTS Current Leads

Lead: DFLX 15

FLANGE STAMPED "38"

Pos. 3

Signed

Wayne E. John

Date

7-7-04



FERMILAB
Technical
Division

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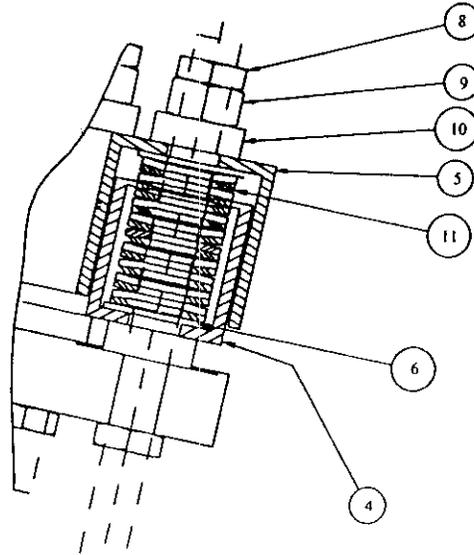


Figure 1.31b An installed Belleville washer assembly.

- 1.29 Tighten the 6 Belleville washer assemblies to apply load to the PEEK seal.
- 1.29.1 Back down the tensioning rod nuts used in Step 1.25 so they are about 5 mm below the power lead flange.
- 1.29.2 Tighten the 6 loading nuts finger-tight. With adjustable parallels, measure and record the gap 'y' indicated in Figure 1.31a between Item 5 (Belleville washer holder upper half) and the power lead top flange at the 6 locations specified in Figure 1.32.2. Units are mm.

A 17.29 B 17.24 C 16.89 D 16.98 E 17.64 F 16.98

- 1.29.3 For each of the six studs: remove the adjustable parallel, adjust it for 1.8 mm of compression, and return the adjustable parallel into position under the Belleville washer holder. Record the adjusted heights of the adjustable parallels. Units are mm.

A 15.49 B 15.44 C 15.09 D 15.18 E 15.84 F ~~15.18~~ 15.18

- 1.29.4 Using the sequence A through F in Figure 1.32.2, sequentially tighten the loading nuts ¼ turn until the total compression is 1.8 mm at each of the six locations. As each loading nut is tightened ¼ turn, check off the appropriate line.

A	<input checked="" type="checkbox"/>	B	<input checked="" type="checkbox"/>	C	<input checked="" type="checkbox"/>	D	<input checked="" type="checkbox"/>	E	<input checked="" type="checkbox"/>	F	<input checked="" type="checkbox"/>
A	<input checked="" type="checkbox"/>	B	<input checked="" type="checkbox"/>	C	<input checked="" type="checkbox"/>	D	<input checked="" type="checkbox"/>	E	<input checked="" type="checkbox"/>	F	<input checked="" type="checkbox"/>

Lead DFLX _____



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A ✓ B ✓ C ✓ D ✓ E ✓ F ✓
 A ✓ B ✓ C ✓ D ✓ E ✓ F ✓
 A ✓ B ✓ C ✓ D ✓ E ✓ F ✓
 A ✓ B ✓ C ✓ D ✓ E ✓ F ✓
 A _____ B _____ C _____ D _____ E _____ F _____
 A _____ B _____ C _____ D _____ E _____ F _____

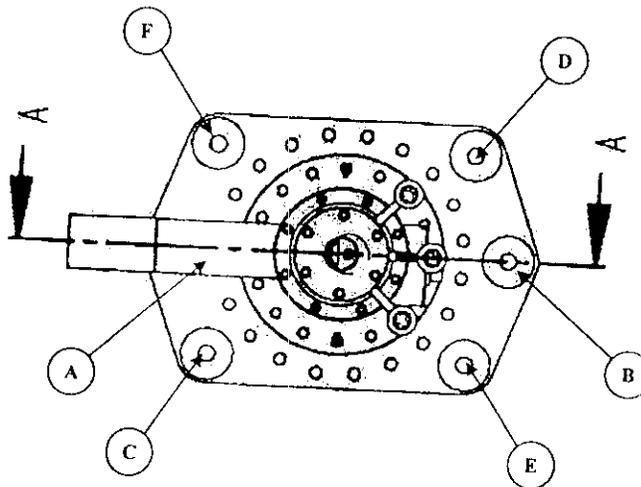


Figure 1.32.2 The specified sequence for tightening the Belleville washer assemblies.

1.29.5 Remove the adjustable parallels from under each Belleville washer assembly, then replace them and measure the final gaps 'y' in Figure 1.31a. Units are mm.

A 15.36 B 15.52 C 14.97 D 15.33 E 15.99 F 15.34

1.29.6 Attach a Conflat flange with a pressure gauge and a fill valve to the gas outlet port. Pressurize to 10 psig. The seal is acceptable if the pressure loss is less than 1 psi after 2 minutes.

1.30 Reduce compression of Belleville washer assemblies.

1.30.1 Remove the Teflon centering ring from the installed power lead.

1.30.2 Back off the loading nuts sequentially to reduce the Belleville compression to 0.75 mm (0.030 in).

1.31 Tighten down the jam nuts to secure the loading nuts on the installed Belleville washer assemblies.



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Box "D"



FERMILAB
Technical Division

Installation of the LHC HTS Current Leads

Lead: DFLX 12

Pos. 4

Signed Wayne E Johnson

Date 1-7-05



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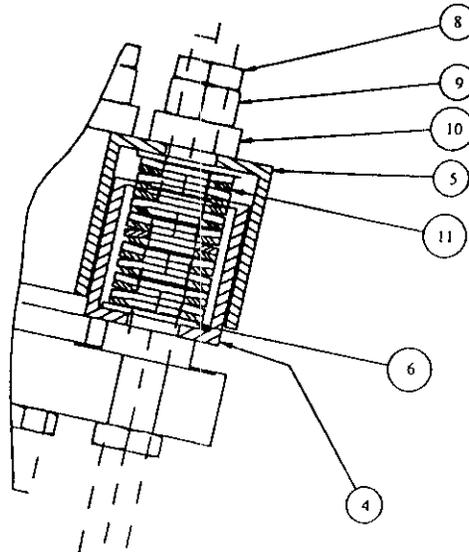


Figure 1.31b An installed Belleville washer assembly.

- 1.29 Tighten the 6 Belleville washer assemblies to apply load to the PEEK seal.
- 1.29.1 Back down the tensioning rod nuts used in Step 1.25 so they are about 5 mm below the power lead flange.
- 1.29.2 Tighten the 6 loading nuts finger-tight. With adjustable parallels, measure and record the gap 'y' indicated in Figure 1.31a between Item 5 (Belleville washer holder upper half) and the power lead top flange at the 6 locations specified in Figure 1.32.2. Units are mm.

A 16.94 B 17.18 C 16.80 D 17.05 E 17.61 F 16.71

- 1.29.3 For each of the six studs: remove the adjustable parallel, adjust it for 1.8 mm of compression, and return the adjustable parallel into position under the Belleville washer holder. Record the adjusted heights of the adjustable parallels. Units are mm.

A 15.14 B 15.38 C 15.00 D 15.25 E 15.81 F 14.91

- 1.29.4 Using the sequence A through F in Figure 1.32.2, sequentially tighten the loading nuts ¼ turn until the total compression is 1.8 mm at each of the six locations. As each loading nut is tightened ¼ turn, check off the appropriate line.

A ✓ B ✓ C ✓ D ✓ E ✓ F ✓

A ✓ B ✓ C ✓ D ✓ E ✓ F ✓

Lead DFLX _____



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- A B C D E F
- A B C D E F
- A B C D E F
- A B C D E F
- A B C D E F
- A B C D E F

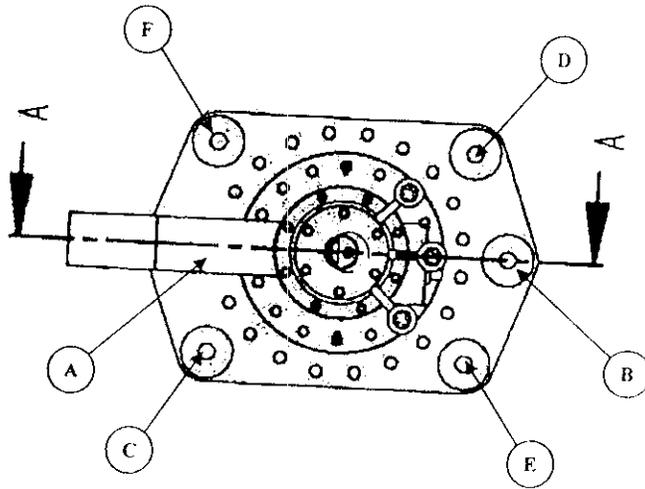


Figure 1.32.2 The specified sequence for tightening the Belleville washer assemblies.

1.29.5 Remove the adjustable parallels from under each Belleville washer assembly, then replace them and measure the final gaps 'y' in Figure 1.31a. Units are mm.

A 15.10 B 15.37 C 15.15 D 15.06 E 15.35 F 15.56

1.29.6 Attach a Conflat flange with a pressure gauge and a fill valve to the gas outlet port. Pressurize to 10 psig. The seal is acceptable if the pressure loss is less than 1 psi after 2 minutes.

1.30 Reduce compression of Belleville washer assemblies.

1.30.1 Remove the Teflon centering ring from the installed power lead.

1.30.2 Back off the loading nuts sequentially to reduce the Belleville compression to 0.75 mm (0.030 in).

1.31 Tighten down the jam nuts to secure the loading nuts on the installed Belleville washer assemblies.

Lead DFLX _____



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Technical Division

Installation of the LHC HTS Current Leads

Lead: **DFLX 12**

FLANGE STAMPED "31"

Pos. 4

Signed Wayne E. Johnson Date 7-10-04



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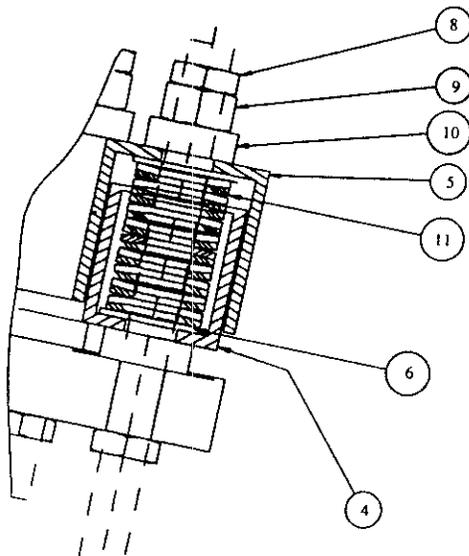


Figure 1.31b An installed Belleville washer assembly.

- 1.29 Tighten the 6 Belleville washer assemblies to apply load to the PEEK seal.
- 1.29.1 Back down the tensioning rod nuts used in Step 1.25 so they are about 5 mm below the power lead flange.
- 1.29.2 Tighten the 6 loading nuts finger-tight. With adjustable parallels, measure and record the gap 'y' indicated in Figure 1.31a between Item 5 (Belleville washer holder upper half) and the power lead top flange at the 6 locations specified in Figure 1.32.2. Units are mm.

A 16.69 B 17.03 C 16.97 D 16.91 E 17.48 F 16.95

- 1.29.3 For each of the six studs: remove the adjustable parallel, adjust it for 1.8 mm of compression, and return the adjustable parallel into position under the Belleville washer holder. Record the adjusted heights of the adjustable parallels. Units are mm.

A 14.89 B 15.23 C 15.17 D 15.11 E 15.68 F 15.15

- 1.29.4 Using the sequence A through F in Figure 1.32.2, sequentially tighten the loading nuts ¼ turn until the total compression is 1.8 mm at each of the six locations. As each loading nut is tightened ¼ turn, check off the appropriate line.

A ✓ B ✓ C ✓ D ✓ E ✓ F ✓

A ✓ B ✓ C ✓ D ✓ E ✓ F ✓

Lead DFLX



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A ✓ B ✓ C ✓ D ✓ E ✓ F ✓
 A ✓ B ✓ C ✓ D ✓ E ✓ F ✓
 A ✓ B ✓ C ✓ D ✓ E ✓ F ✓
 A ✓ B ✓ C ✓ D ✓ E ✓ F ✓
 A _____ B _____ C _____ D _____ E _____ F _____
 A _____ B _____ C _____ D _____ E _____ F _____

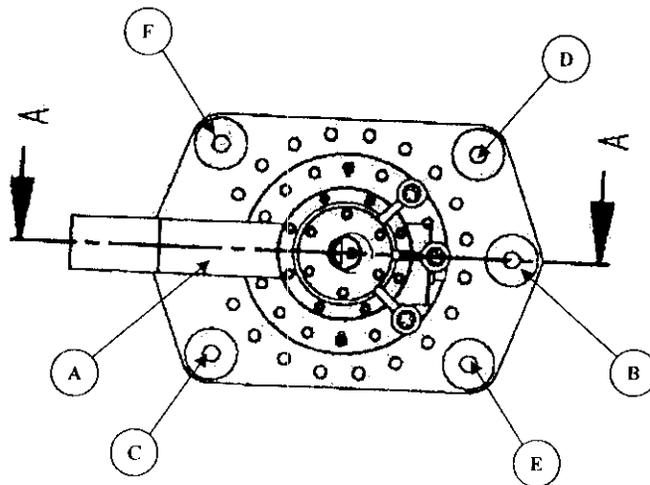


Figure 1.32.2 The specified sequence for tightening the Belleville washer assemblies.

1.29.5 Remove the adjustable parallels from under each Belleville washer assembly, then replace them and measure the final gaps 'y' in Figure 1.31a. Units are mm.

A 14.64 B 15.33 C 15.34 D 15.09 E 15.67 F 15.13

1.29.6 Attach a Conflat flange with a pressure gauge and a fill valve to the gas outlet port. Pressurize to 10 psig. The seal is acceptable if the pressure loss is less than 1 psi after 2 minutes.

1.30 Reduce compression of Belleville washer assemblies.

1.30.1 Remove the Teflon centering ring from the installed power lead.

1.30.2 Back off the loading nuts sequentially to reduce the Belleville compression to 0.75 mm (0.030 in).

1.31 Tighten down the jam nuts to secure the loading nuts on the installed Belleville washer assemblies.



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Box "D"



FERMILAB
Technical Division

Installation of the LHC HTS Current Leads

Lead: DFLX 13

Pos. 5

Signed Wayne E. Johnson Date 1-7-05



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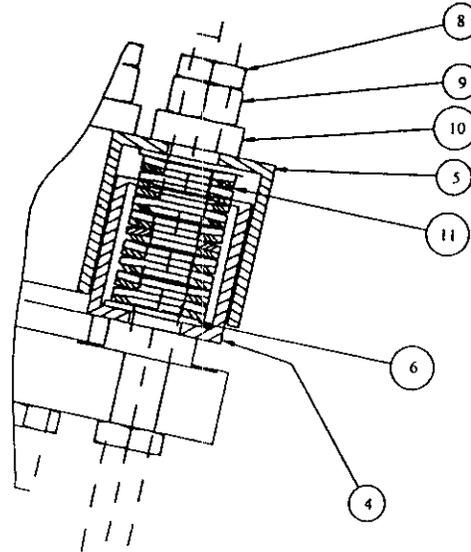


Figure 1.31b An installed Belleville washer assembly.

- 1.29 Tighten the 6 Belleville washer assemblies to apply load to the PEEK seal.
- 1.29.1 Back down the tensioning rod nuts used in Step 1.25 so they are about 5 mm below the power lead flange.
- 1.29.2 Tighten the 6 loading nuts finger-tight. With adjustable parallels, measure and record the gap 'y' indicated in Figure 1.31a between Item 5 (Belleville washer holder upper half) and the power lead top flange at the 6 locations specified in Figure 1.32.2. Units are mm.

A 16.92 B 17.10 C 17.21 D 17.22 E 17.57 F 17.28

- 1.29.3 For each of the six studs: remove the adjustable parallel, adjust it for 1.8 mm of compression, and return the adjustable parallel into position under the Belleville washer holder. Record the adjusted heights of the adjustable parallels. Units are mm.

A 15.12 B 15.30 C 15.41 D 15.42 E 15.77 F 15.48

- 1.29.4 Using the sequence A through F in Figure 1.32.2, sequentially tighten the loading nuts ¼ turn until the total compression is 1.8 mm at each of the six locations. As each loading nut is tightened ¼ turn, check off the appropriate line.

A ✓ B ✓ C ✓ D ✓ E ✓ F ✓

A ✓ B ✓ C ✓ D ✓ E ✓ F ✓



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A B C D E F
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 A B C D E F
 A B C D E F
 A B C D E F
 A B C D E F

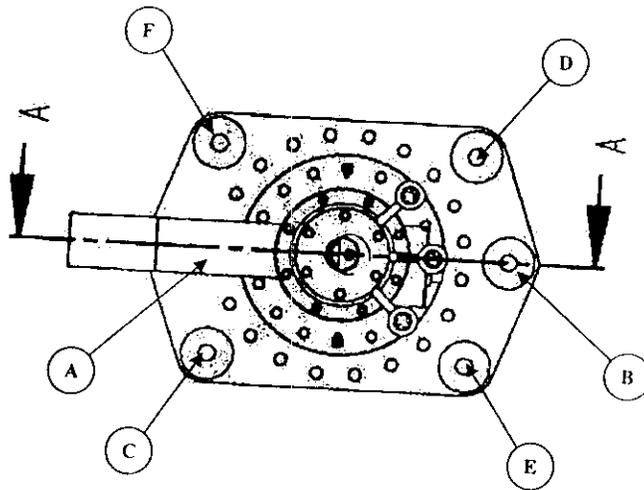


Figure 1.32.2 The specified sequence for tightening the Belleville washer assemblies.

1.29.5 Remove the adjustable parallels from under each Belleville washer assembly, then replace them and measure the final gaps 'y' in Figure 1.31a. Units are mm.

A 15.22 B 15.38 C 14.76 D 14.83 E 15.81 F 15.50

1.29.6 Attach a Conflat flange with a pressure gauge and a fill valve to the gas outlet port. Pressurize to 10 psig. The seal is acceptable if the pressure loss is less than 1 psi after 2 minutes.

1.30 Reduce compression of Belleville washer assemblies.

1.30.1 Remove the Teflon centering ring from the installed power lead.

1.30.2 Back off the loading nuts sequentially to reduce the Belleville compression to 0.75 mm (0.030 in).

1.31 Tighten down the jam nuts to secure the loading nuts on the installed Belleville washer assemblies.



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Box "D"



FERMILAB
Technical Division

Installation of the LHC HTS Current Leads

Lead: DFLX 13

FLANGE STAMPED "16"

Pos. 5

Signed Wayne P. Johnson Date 7-10-04



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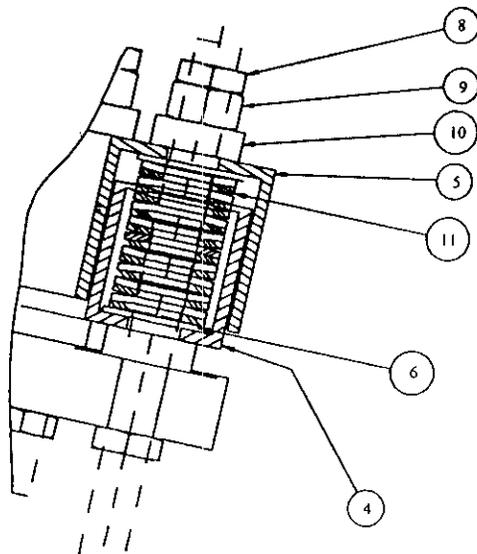


Figure 1.31b An installed Belleville washer assembly.

1.29 Tighten the 6 Belleville washer assemblies to apply load to the PEEK seal.
1.29.1 Back down the tensioning rod nuts used in Step 1.25 so they are about 5 mm below the power lead flange.

1.29.2 Tighten the 6 loading nuts finger-tight. With adjustable parallels, measure and record the gap 'y' indicated in Figure 1.31a between Item 5 (Belleville washer holder upper half) and the power lead top flange at the 6 locations specified in Figure 1.32.2. Units are mm.

A 16.96 B 16.95 C 16.84 D 17.32 E 17.52 F 17.56

1.29.3 For each of the six studs: remove the adjustable parallel, adjust it for 1.8 mm of compression, and return the adjustable parallel into position under the Belleville washer holder. Record the adjusted heights of the adjustable parallels. Units are mm.

A 15.14 B 15.15 C 15.04 D 15.52 E 15.72 F 15.74

1.29.4 Using the sequence A through F in Figure 1.32.2, sequentially tighten the loading nuts ¼ turn until the total compression is 1.8 mm at each of the six locations. As each loading nut is tightened ¼ turn, check off the appropriate line.

A ✓ B ✓ C ✓ D ✓ E ✓ F ✓
A ✓ B ✓ C ✓ D ✓ E ✓ F ✓



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A	✓	B	✓	C	✓	D	✓	E	✓	F	✓
A	✓	B	✓	C	✓	D	✓	E	✓	F	✓
A	✓	B	✓	C	✓	D	✓	E	✓	F	✓
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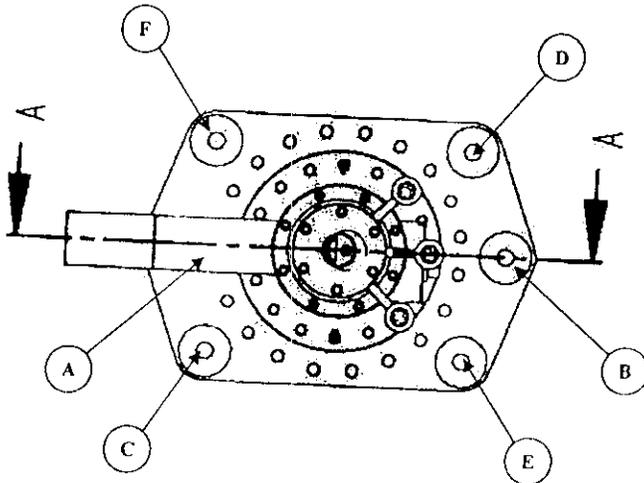


Figure 1.32.2 The specified sequence for tightening the Belleville washer assemblies.

1.29.5 Remove the adjustable parallels from under each Belleville washer assembly, then replace them and measure the final gaps 'y' in Figure 1.31a. Units are mm.

A 15.09 B 15.08 C 14.32 D 15.55 E 15.64 F 15.76

1.29.6 Attach a Conflat flange with a pressure gauge and a fill valve to the gas outlet port. Pressurize to 10 psig. The seal is acceptable if the pressure loss is less than 1 psi after 2 minutes. **MAKE SURE D H LINE HAS VALVE STEMS INSTALLED**

1.30 Reduce compression of Belleville washer assemblies.

1.30.1 Remove the Teflon centering ring from the installed power lead.

1.30.2 Back off the loading nuts sequentially to reduce the Belleville compression to 0.75 mm (0.030 in).

1.31 Tighten down the jam nuts to secure the loading nuts on the installed Belleville washer assemblies.

Lead DFLX _____



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Box "D"



FERMILAB
Technical Division

Installation of the LHC HTS Current Leads

Lead: DFLX 14

Pos. 6

Signed Wayne E. Johnson

Date 1-7-05



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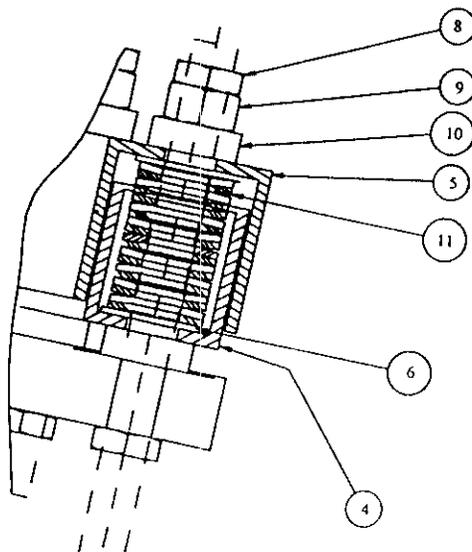


Figure 1.31b An installed Belleville washer assembly.

- 1.29 Tighten the 6 Belleville washer assemblies to apply load to the PEEK seal.
- 1.29.1 Back down the tensioning rod nuts used in Step 1.25 so they are about 5 mm below the power lead flange.
- 1.29.2 Tighten the 6 loading nuts finger-tight. With adjustable parallels, measure and record the gap 'y' indicated in Figure 1.31a between Item 5 (Belleville washer holder upper half) and the power lead top flange at the 6 locations specified in Figure 1.32.2. Units are mm.

A 17.11 B 17.46 C 16.72 D 17.15 E 17.64 F 17.18

- 1.29.3 For each of the six studs: remove the adjustable parallel, adjust it for 1.8 mm of compression, and return the adjustable parallel into position under the Belleville washer holder. Record the adjusted heights of the adjustable parallels. Units are mm.

A 15.31 B 15.66 C 14.92 D 15.35 E 15.84 F 15.38

- 1.29.4 Using the sequence A through F in Figure 1.32.2, sequentially tighten the loading nuts ¼ turn until the total compression is 1.8 mm at each of the six locations. As each loading nut is tightened ¼ turn, check off the appropriate line.

A ✓ B ✓ C ✓ D ✓ E ✓ F ✓
A ✓ B ✓ C ✓ D ✓ E ✓ F ✓

Lead DFLX _____



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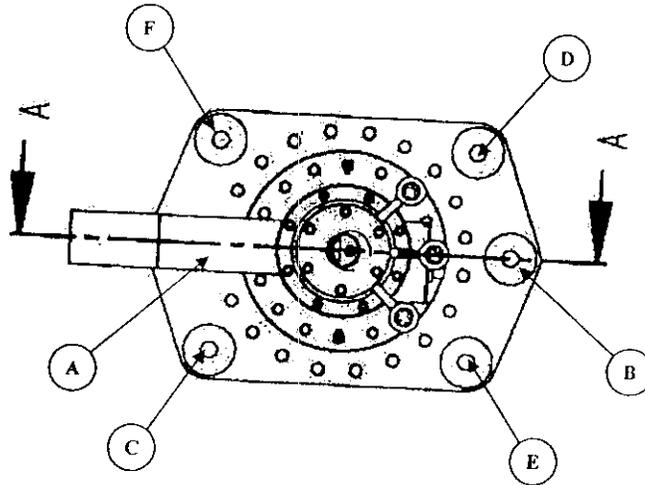


Figure 1.32.2 The specified sequence for tightening the Belleville washer assemblies.

1.29.5 Remove the adjustable parallels from under each Belleville washer assembly, then replace them and measure the final gaps 'y' in Figure 1.31a. Units are mm.

A 15.09 B 15.61 C 15.07 D 15.10 E 15.95 F 15.81

1.29.6 Attach a Conflat flange with a pressure gauge and a fill valve to the gas outlet port. Pressurize to 10 psig. The seal is acceptable if the pressure loss is less than 1 psi after 2 minutes.

1.30 Reduce compression of Belleville washer assemblies.

1.30.1 Remove the Teflon centering ring from the installed power lead.

1.30.2 Back off the loading nuts sequentially to reduce the Belleville compression to 0.75 mm (0.030 in).

1.31 Tighten down the jam nuts to secure the loading nuts on the installed Belleville washer assemblies.

Lead DFLX



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Box "D"



FERMILAB
Technical Division

Installation of the LHC HTS Current Leads

Lead: DFLX 14

FLANGE STAMPED "28"

Pos. 6

Signed

Way E. Johns

Date

7-8-04



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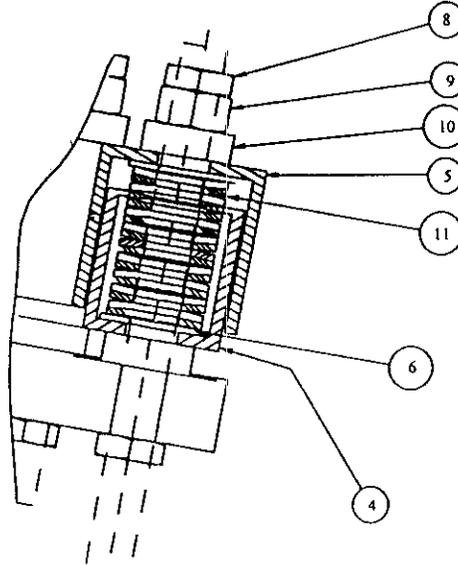


Figure 1.31b An installed Belleville washer assembly.

1.29 Tighten the 6 Belleville washer assemblies to apply load to the PEEK seal.

1.29.1 Back down the tensioning rod nuts used in Step 1.25 so they are about 5 mm below the power lead flange.

1.29.2 Tighten the 6 loading nuts finger-tight. With adjustable parallels, measure and record the gap 'y' indicated in Figure 1.31a between Item 5 (Belleville washer holder upper half) and the power lead top flange at the 6 locations specified in Figure 1.32.2. Units are mm.

A 16.71 B 17.20 C 16.55 D 17.10 E 17.36 F 16.73

1.29.3 For each of the six studs: remove the adjustable parallel, adjust it for 1.8 mm of compression, and return the adjustable parallel into position under the Belleville washer holder. Record the adjusted heights of the adjustable parallels. Units are mm.

A 14.91 B 15.40 C 14.75 D 15.30 E 15.56 F 14.93

1.29.4 Using the sequence A through F in Figure 1.32.2, sequentially tighten the loading nuts ¼ turn until the total compression is 1.8 mm at each of the six locations. As each loading nut is tightened ¼ turn, check off the appropriate line.

A ✓ B ✓ C ✓ D ✓ E ✓ F ✓

A ✓ B ✓ C ✓ D ✓ E ✓ F ✓

Lead DFLX _____



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A ✓ B ✓ C ✓ D ✓ E ✓ F ✓
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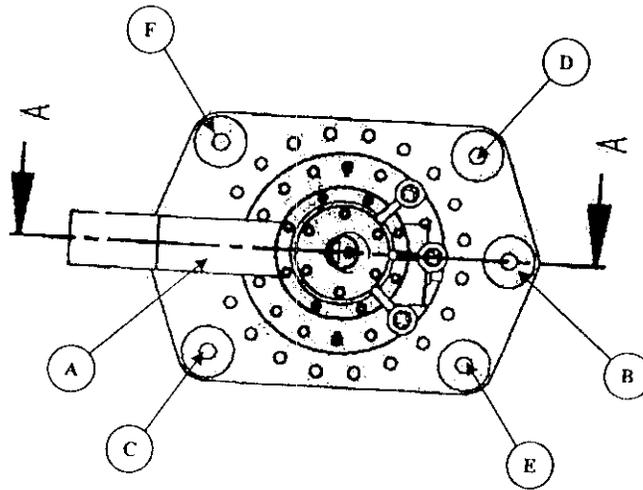


Figure 1.32.2 The specified sequence for tightening the Belleville washer assemblies.

1.29.5 Remove the adjustable parallels from under each Belleville washer assembly, then replace them and measure the final gaps 'y' in Figure 1.31a. Units are mm.

A 15.06 B 15.52 C 14.57 D 15.24 E 15.41 F 15.00

1.29.6 Attach a Conflat flange with a pressure gauge and a fill valve to the gas outlet port. Pressurize to 10 psig. The seal is acceptable if the pressure loss is less than 1 psi after 2 minutes.

1.30 Reduce compression of Belleville washer assemblies.

1.30.1 Remove the Teflon centering ring from the installed power lead.

1.30.2 Back off the loading nuts sequentially to reduce the Belleville compression to 0.75 mm (0.030 in).

1.31 Tighten down the jam nuts to secure the loading nuts on the installed Belleville washer assemblies.