Xi'an Jiaotong-Liverpool University
西交利物浦大學

General Operating Procedure for:

Avanti J-26S XPI

High-performance Centrifuge

Department of Health and Environmental Sciences

By Yili Cheng

Contents

1. Purpose

The purpose of this GOP is to regulate the operation of Avanti J-26S XPI high-performance centrifuge.

2. Scope

This GOP applies to all personnel using and managing Avanti J-26S XPI high-performance centrifuge.

3. Rotors introduction

3.1 Assembly drawing for different rotors (fig.1).

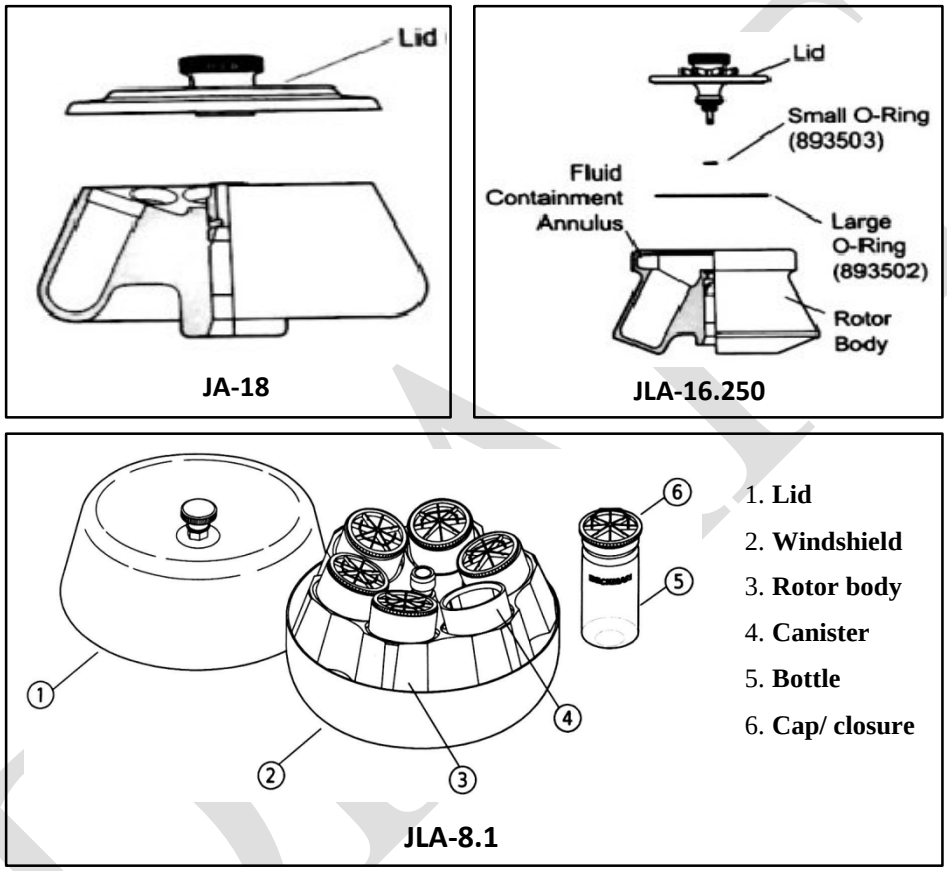

Fig.1 Rotors available in lab

3.2 Key parameters (table.1).

Table 1 Key parameters for available rotors

Rotor name:	**Maximum speed /rpm**	Critical speed range / rpm	Maximum solution density / g/mL	**Maximum allowable imbalance of opposing loads / grams**	Nominal tube capacity / mL
JA-18	**18000**	600 to 800	1.2	**2**	100
JLA-16.250	**16000**	600 to 800	1.2	**10**	250
JLA-8.1	**8000**	200 to 400	1.2	**30**	1000

4. Safety notice:

Read all safety notice before using the rotor and centrifuge.

- Do not run toxic, pathogenic, or radioactive materials in this centrifuge without taking appropriate safety precautions.
- Do not use the centrifuge in the vicinity of flammable liquids or vapors, and do not run such materials in the centrifuge.
- Only the components and accessories listed in the applicable rotor manual could be used in the corresponding rotor.
- Make sure that filled containers are loaded symmetrically into the rotor and that opposing tubes are filled to the same level with liquid of the same density.
- If disassembly reveals evidence of leakage and pathogenic or radioactive materials are involved, apply appropriate decontamination procedures to the centrifuge and accessories.
- Never exceed the maximum rated speed of the rotor and lab ware in use.
- Do not use sharp tools on the rotor that could cause scratches.
- Do not lean on the centrifuge or place items on it while it is operating.
- ***For JA-18:*** Do not run an empty rotor. Place filled tubes in at least two opposing cavities.

5. Procedure

5.1Switching on the system

5.1.1 Press the power switch to on (I).

5.1.2 Depress the foot pedal to open the chamber door (fig.2).

Fig. 2 Centrifuge

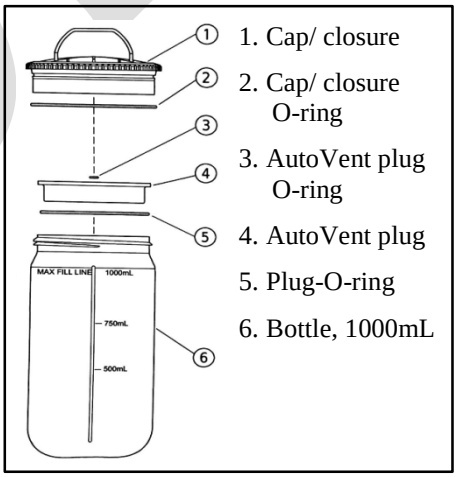

Fig.3 1000-mL bottle assemblies used in JLA-8.1

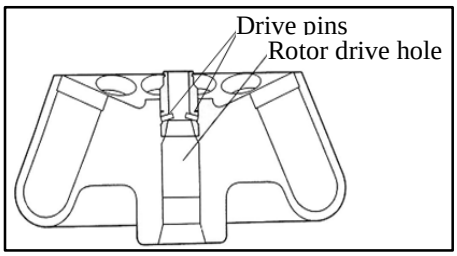

Fig.4 Rotor drive pin location

5.2 Prerun safety check

- Make sure that the rotor, lid, and all tubes or bottles are clean and show no signs of corrosion or cracking.
- ***For JLA-8.1*:** Before each use, inspects the canister, adapter (if needed), each bottle, cap/ closure, and plug (fig.3) for cracks or damage. Do not use damaged components.
- ***For JLA-8.1:*** Make sure that the plug and cap/closure O-rings (fig.3) are in good condition, are properly installed, and are completely dry and unlubricated.
- Inspect the rotor drive pins (fig.4) to ensure that they are not damaged.
- Check the chemical compatibilities of all materials used.
- Verify that the tubes and bottles being used are listed in the applicable rotor manual.
- If fluid containment is required, use capped tubes or bottles.

  We strongly recommend capping all containers carrying physiological fluids to prevent leakage.

5.3 Rotor Preparation

- For low-temperature runs, precool the rotor, canisters (JLA-8.1), labware and sample in a refrigerator at the required temperature before use.
- Plastic labware has been centrifuge tested for use at temperatures between 2 and 25°C. For centrifugation at other temperatures, pretest tubes under anticipated run conditions.
- If plastic containers are frozen before use, make sure that they are thawed to at least 2°C prior to centrifugation.
- ***For JLA-8.1:*** For high-temperature runs, spray a light coating of PTFE spray (366772) on the top surface only of the plug and wait the plug to dry completely before use.

5.4 Loading samples

5.4.1 Load the filled containers symmetrically into the rotor (fig.5). Opposing tubes must be filled to the same level with liquid of the same density. **The maximum allowable imbalance of opposing loads is 2 grams for JA-18 and 10 grams for JLA-16.250.**

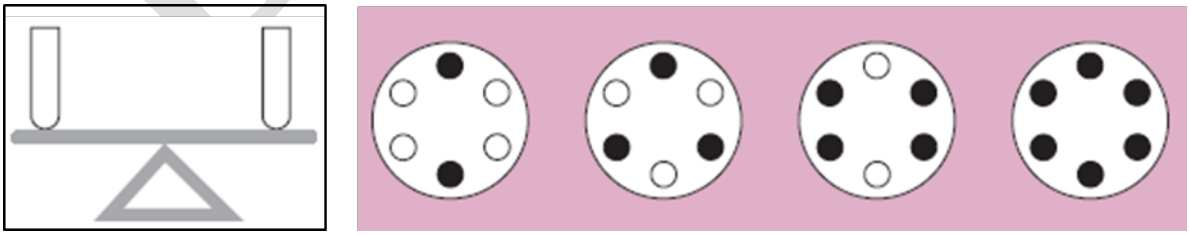

Fig.5 Loading samples symmetrically

5.4.2 Firmly close the chamber door.

For JLA-8.1:

- Load opposing canisters with the same type of labware containing the same amounts of fluid of equal density and place empty canisters in the other cavities. **Opposing filled canister, plus labware and sample, must weigh within 30 grams of each other.**
- Do not exceed the rated maximum sample load for any single canister, which is 1500 grams, including bottle, sample, plug, cap/closure and adapter.
- Six canisters must be run at all times, whether loaded or empty. Do not place cap/ closures on top of empty canister.
- Firmly close the chamber door.

Loading the 1000-mL bottle and labware assemblies:

a. Load sample into a bottle; do not fill above the maximum fill line marked on the bottle.

b. Place a plug on the bottle, then place a closure over the plug and tighten firmly, to where the scribe mark is as closely as possible aligned with the vent line on the bottle, or beyond the line if possible (fig.6).

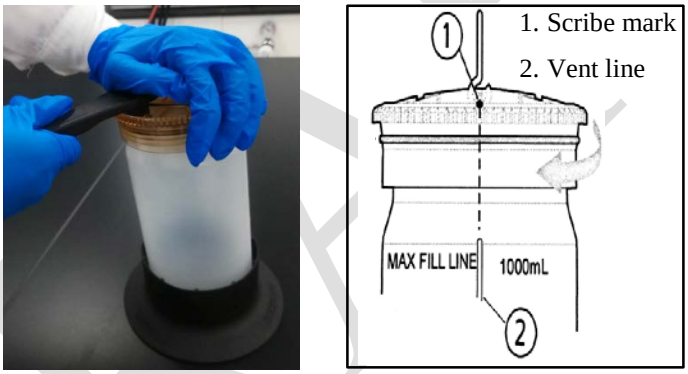

Fig.6 Tightening the closure

c. Place filled, sealed labware assemblies in canister. Never place a bottle directly into a canister.

Loading the 500-mL adapters:

a. Prepare the 500-mL adapter by making sure the two O-rings are in good condition, are properly installed, and are completely dry and unlubricated.

b. Fill and seal the bottles or tubes to be used in the 500-mL adapters.

c. If 500-mL bottles are uses, place each bottle directly into a 500- mL adapter.

d. For bottles of different sizes, first load the bottles into the adapter listed in JLA-8.1 rotor manual, then place the filled bottle/ adapter assembly into the 500-mL adapters.

e. Place the adapter cap on the adapter, push down and twist.

f. Hold the adapter by the adapter body and place the filled adapter into the canister.

5.5 Installing the rotor

5.5.1 Lubricate the rotor drive pins and metal threads (in the rotor or on the lid) with a thin, even coat of Spinkote lubricant (fig.7).

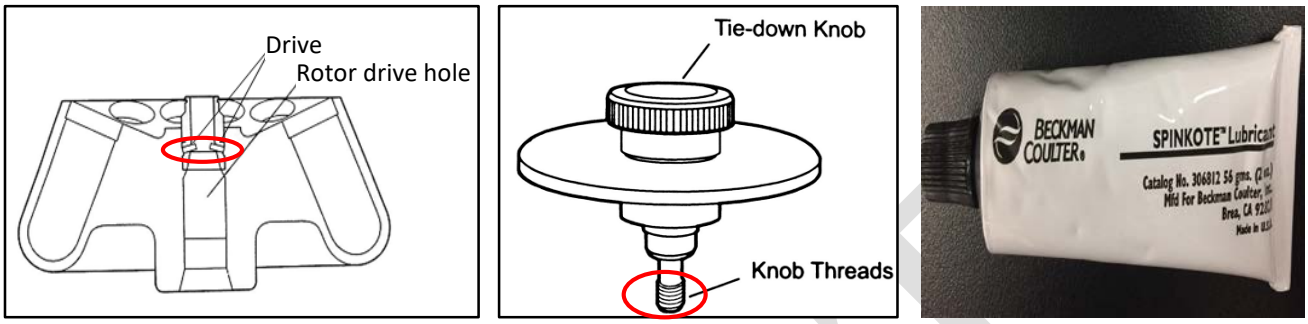

Fig.7 Lubrication area (Spinkote)

5.5.2 ***For JLA-16.250:*** Lightly coat the large and small lid O-rings with silicone vacuum grease (fig.8).

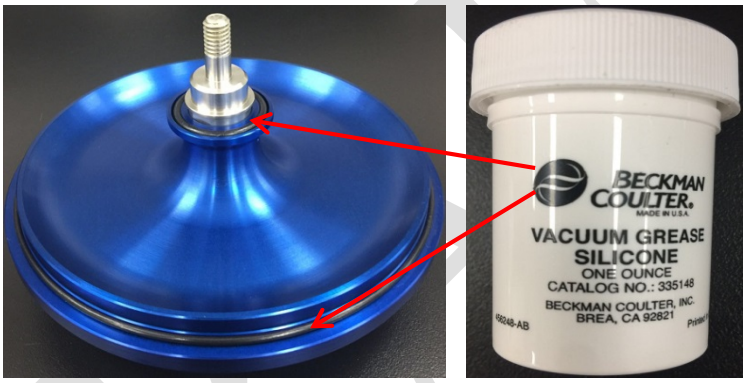

Fig.8 Lubrication area (vacuum grease silicone)

5.5.3 Turn the rotor until the BECKMAN COULTER name or 2 v-shaped indicator marks are horizontal to the drive hub teeth. Alternately, rotate the drive spindle to align the drive hub teeth with the drive pins (fig.9).

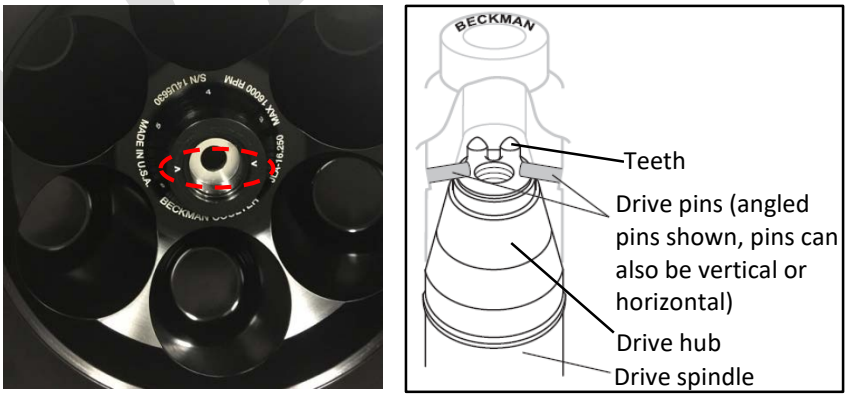

Fig. 9 Drive pins orientation

For JLA-8.1: Hold the rotor by the scalloped areas between the canister cavities (fig.10). Do not hold the rotor by the windshield during installation.

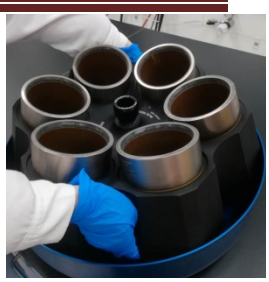

Fig.10 Holding the rotor JLA-8.1

5.5.4 Carefully lower the rotor straight down onto the drive spindle.

Caution: Do not drop the rotor onto the hub.

Be sure the pins in the rotor drive hole are not sitting on top of the teeth on the drive spindle hub.

5.5.5 Slowly turn the rotor, making sure that it is properly seated on the drive spindle hub.

5.5.6 Load samples.

5.5.7 Place the lid on the rotor. Press the lid knob down and turn it to the right until secure.

Caution*:*

- ***The lid of JA-18 cannot be locked, but it must be placed properly on the rotor.***
- **Before each run, make sure the rotor is seated on the centrifuge drive hub, with the rotor drive pins alongside the teeth on the top surface of the hub (fig.9), and that the lid knob is tight.**

5.6 Setting method and starting

5.6.1 For low-temperature runs, precool the rotor, labware and sample before use, especially before short runs. A suggested precooling cycle is a minimum of 30 min at 2000rpm at the required temperature.

5.6.2 Setting method (manual run) or choosing method (programed run).

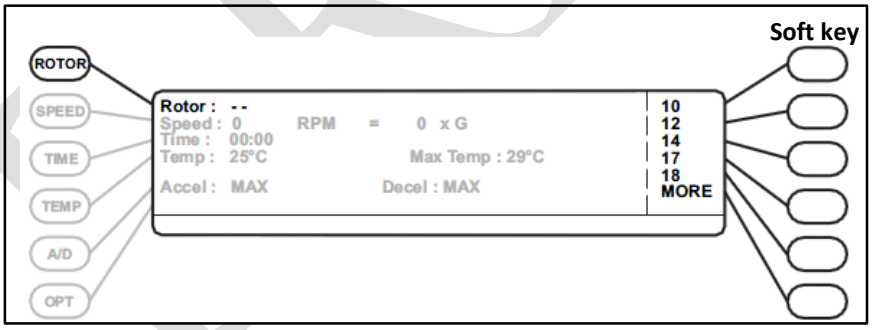

Fig.11 Operation panel

Manual run

- Press ROTOR, press the soft key to select rotor type, press the soft key to select the rotor name.
- Press TEMP then use the keypad to enter the required run temperature. Press ENTER.
- Press SPEED, press the soft key to select RPM or RCF mode, then use the keypad to enter the run speed (0 to 26,000 RPM).

- Press TIME press the soft key to select a time mode (HH:MM, Hold or w2t), then use the keypad to enter the run time or w2t value. (No entry is made in Hold mode.)
- Press A/D and press the MAX, SLOW, or TIME soft key. Or, skip this step and accept the default acceleration rate (MAX).
- Press A/D and press the MAX, SLOW, TIME, or OFF soft key. Or, skip this step and accept the default deceleration rate (MAX).

Or **programed run**

- Press OPT then use the keypad to enter the program number.

5.6.3 Check that all parameters are correct. Press ENTER.

5.6.4 Press the door firmly to make sure it is well locked (fig. 12).

5.6.5 Press START to run the machine.

Fig.12 Locking the door

5.7 Shutting down the system

5.7.1 Wait for the set time to count down to zero, or end the run by pressing STOP.

5.7.2 When the rotor stops, depress the foot pedal to open the chamber door.

5.8 Removal and sample recovery

5.7.2 Unscrew the rotor lid to release the rotor from the spindle hub.

5.7.3 Remove the rotor by lifting it straight up and off the drive spindle.

For JA-18:

If the rotor sticks to the drive spindle:

- Remove the lid and use an adjustable wrench to unscrew the tie-down bolt assembly from the rotor. Set the bolt assembly aside.
- Screw the larger end of the rotor removal tool into the threaded opening (Fig.13). As the removal tool tightens down, it pushes against the drive hub, forcing the rotor up and off of the hub.

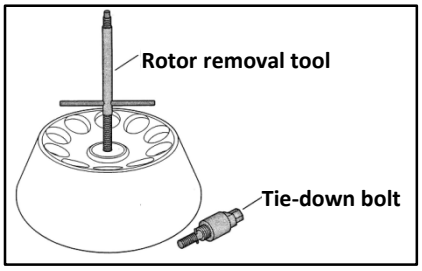

Fig.13 Using the rotor removal tool

- Unscrew the removal tool.
- Reassemble the tie-down bolt in the rotor and tighten it securely with the adjustable wrench.
- Remove the rotor from the centrifuge.

For JLA-8.1:

- Unscrew the rotor lid knob, remove the lid and set it aside.
- Grasp the metal handle on top of each closure and, using a lifting and twisting motion, lift the sealed bottle assemblies out of each canister.

- If required, place the sealed bottles under a safety hood before removing the closures and plugs.
- Use caution when opening the sealed assemblies. Tools are available to assist in loosening closures.
- Use the spatula provided to remove pellet from the bottle. Do not use a metal tool to remove pellet.

5.9 Cleaning

5.9.1 Clean the centrifuge and rotor immediately if salts or other corrosive materials are used or if spillage has occurred. Under normal use, clean the centrifuge and rotor frequently to prevent buildup of residues.

5.9.2 Frequently wiping the centrifuge and rotor with a cloth or paper towel.

5.9.3 For through cleaning, wash the centrifuge, rotor and lid with diluted solution 555 (10 parts water to 1 part detergent), thoroughly rinse with DI water and air dry. Do not use acetone.

Note: do not wash rotor in a dishwasher. Do not soak in detergent solution for long periods.

Reference:

1. Instructions for use Avanti J-26S XPI high-performance centrifuge, Beckman coulter, PN B10093AC, December 2013.

2. JA-18 fixed angle rotor, Beckman coulter, J-TB-035AP, February 2009.

3. J-Lite, JLA-16.250 fixed angle rotor, J-TB-072JA, February 2014.

4. Instructions for use J-Lite, JLA-8.1000 and JLA-9.1000 fixed-angle rotor assemblies, PN J-TB-073GB, July 2013.

Document information:

Document No:	GOP-centrifuge-01	Version No:	0.1 (draft)
Drafted/ modified by:	Yili Cheng	Effective date:	
Comments:			