

ROBINSON HELICOPTER COMPANY

R44 MAINTENANCE MANUAL AND INSTRUCTIONS FOR CONTINUED AIRWORTHINESS RTR 460 VOLUME I

Production Certificate Number 424WE

Type Certificate Number H11NM



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OFFICE HOURS

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Lunch hour is 11:30 a.m. to 12:30 p.m.

HOLIDAYS

Please visit <https://robinsonheli.com> for a list of holidays and company shutdowns.

CUSTOMER SUPPORT AND SPARES ORDERS

Please visit <https://robinsonheli.com> for Customer Support contact information. Procure parts from any R44 Dealer or Service Center, or order directly from RHC Customer Service via email, fax, or phone.

PUBLICATIONS

Viewing RHC Maintenance Manuals (MMs) and Illustrated Parts Catalogs (IPCs) online at <https://robinsonheli.com> is recommended to ensure use of current data. Viewing MMs and IPCs offline via paper or digital download requires verification that the data is current. Refer to the online MM or IPC Revision Log for the list of current pages.

SUBSCRIPTION ORDER AND RENEWAL FORMS

Subscription order and renewal forms are located at <https://robinsonheli.com>.

WARRANTY INFORMATION

Helicopter and parts warranty information is located at <https://robinsonheli.com>.

18-22 Weighing Procedure and Calculations

NOTE

- Arm is the distance in inches from datum.
- Datum is located 100 inches forward of main rotor centerline.
- CG (arm) is determined by dividing total moment by total weight.

1. Refer to § 18-20. Prepare helicopter for weighing per § 18-21.
2. Hoist helicopter per § 17-20 approximately one foot above ground. Have one person hold tail skid while hoisting to stabilize helicopter.
3. With main rotor blades oriented approximately fore and aft, raise both blades off droop stops to allow hub to teeter freely. Raise tail slightly, release, and allow to settle.
4. Refer to Figure 18-3. With aircraft hanging freely and steady, use a water level and measure difference in vertical height between tail rotor gearbox centerline and cabin belly at vertical firewall. Ensure no air bubbles in water level tube.

Record height difference: _____ inches

5. Slowly lower both main rotor blades. Determine uncorrected longitudinal center of gravity:

$$114.34 - [0.32 \times (\text{height difference from step 4})] = \text{_____ inches}$$

6. Place a 1000-lb capacity (minimum) scale under each skid. Locate center of scales approximately 6 inches forward of ground handling wheel supports.
7. Lower helicopter until it rests entirely on scales. Helicopter must be well balanced on scales before releasing tail. Be sure helicopter is level laterally by placing level on center of aft landing gear cross tube.
8. Determine uncorrected empty weight:

Right scale reading: _____ lb

Left scale reading: + _____ lb

Tare (leveling shims, hoist fixture, etc.): - _____ lb

Uncorrected empty weight: = _____ lb

9. Calculate CG with full fuel and 150 lb pilot:

$$\frac{[(CG \text{ from step 5}) \times (\text{Empty weight from step 8})] + 37333}{(\text{Empty weight from step 8}) + 436.2} = \text{_____ inches}$$

Adjust ballast per step 10 as required until calculated CG is between 101.5 and 102.5 inches.

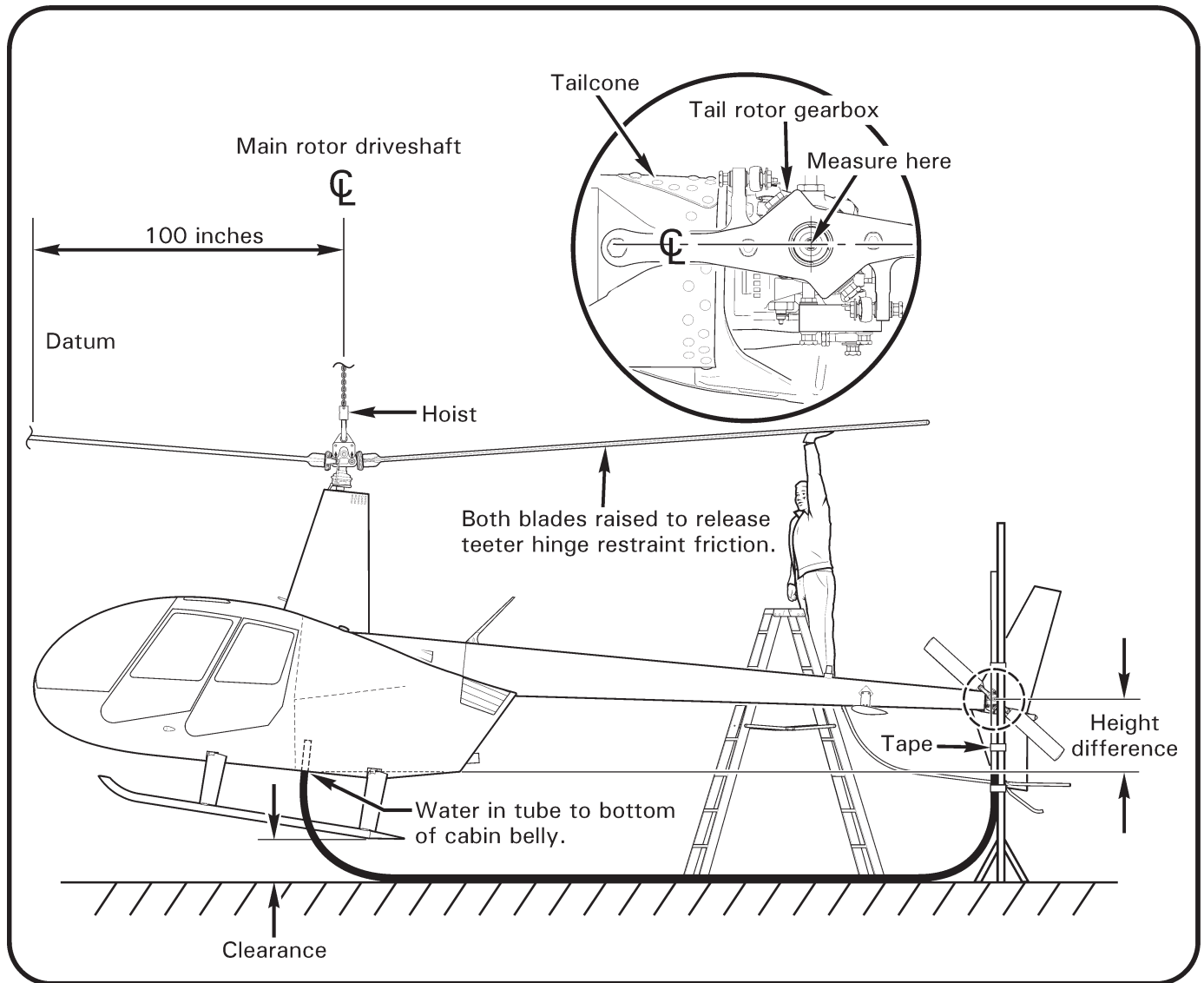


FIGURE 18-3 DETERMINING CG USING WATER LEVEL

18-22 Weighing Procedure and Calculations (continued)

10. a. If calculated CG from step 9 is aft of 102.5 inches, determine nose ballast required:

$$\frac{[(CG \text{ from step 5} - 102.5) \times (\text{Empty weight from step 8})] - 7378}{95.5} = \text{_____ lb}$$

Round ballast weight up to nearest 0.25 lb: _____ lb

Install nose ballast per § 18-31. Repeat steps 2 thru 10 and revise measurements and calculations.

b. If calculated CG from step 9 is forward of 101.5 inches and nose ballast is installed, determine nose ballast to remove:

$$\frac{(102.5 - \text{Calculated CG from step 9}) \times (\text{Empty weight from step 8} + 436.2)}{95.5} = \text{_____ lb}$$

Round ballast weight down to nearest 0.25 lb: _____ lb

Remove nose ballast per § 18-31. Repeat steps 2 thru 10 and revise measurements and calculations.

c. If calculated CG from step 9 is forward of 101.5 inches and nose ballast is not installed, install empennage ballast per § 18-32. Repeat steps 2 thru 10 and revise measurements and calculations.

11. Adjust weight and balance to correct for drained unusable fuel:

| Item | Weight (lb) | | Longitudinal CG (arm, inches) | | Moment (in.-lb) |
|---|-----------------|---|----------------------------------|---|-----------------|
| Helicopter as weighed | _____ | x | _____ | = | _____ |
| | <i>(step 8)</i> | | <i>(step 5)</i> | | |
| Unusable fuel (add): | +7.2 | x | 96.0 | = | +691 |
| Basic empty weight and CG (includes unusable fuel & full oil) | _____ | x | _____ | * | = _____ |

* CG location (arm) is determined by dividing total moment by total weight

CAUTION

Calculated CG with full fuel and 150 lb pilot must be at, or forward of, 102.5 inches aft CG limit.

12. Determine lateral center of gravity:

$$\frac{(\text{Right scale reading} - \text{Left scale reading})}{(\text{Right scale reading} + \text{Left scale reading})} \times 41.2 = \text{_____ inches}$$

13. Determine lateral moment:

(Basic Empty Weight) x (lateral CG) = _____ in.-lb

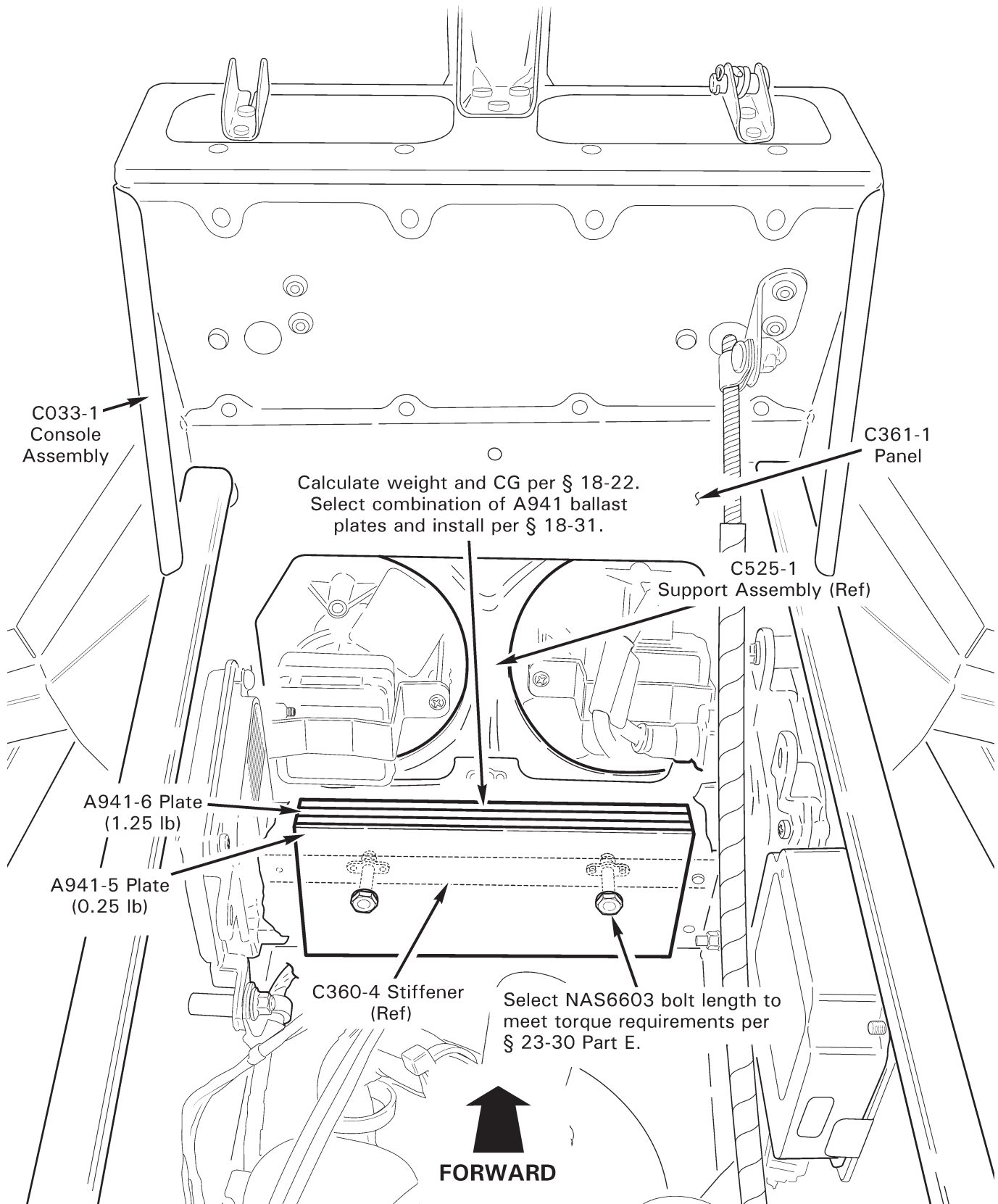


FIGURE 18-4 NOSE BALLAST
(View inside lower console assembly with upper console hinged aft)

REVISION LOG

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The R44 Maintenance Manual (MM) list of effective pages and effective dates are given below. If a previously issued page is not listed below, it is no longer an effective page and must be discarded. The issue or revision date is in bold at the top of each revision log page.

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| 14.20O..... | JUN 2014 | 14.54..... | AUG 2019 | 15.10..... | JAN 2021 |
| 14.20P..... | JUN 2014 | 14.55..... | AUG 2019 | 15.11..... | JAN 2021 |
| 14.20Q..... | JUN 2014 | 14.56..... | AUG 2019 | 15.12..... | JAN 2021 |
| 14.20R..... | JUN 2014 | 14.57..... | AUG 2019 | 15.13..... | JAN 2021 |
| 14.21..... | JUL 2021 | 14.58..... | AUG 2019 | 15.14..... | JAN 2021 |
| 14.22..... | JUL 2021 | 14.59..... | AUG 2019 | 15.15..... | DEC 2021 |
| 14.23..... | JUL 2021 | 14.60..... | AUG 2019 | 15.16..... | DEC 2021 |
| 14.24..... | JUL 2021 | 14.61..... | AUG 2019 | | |
| 14.25..... | AUG 2019 | 14.62..... | AUG 2019 | 16.i..... | FEB 2024 |
| 14.26..... | AUG 2019 | 14.62A..... | AUG 2022 | 16.ii..... | FEB 2024 |
| 14.27..... | 11 Jun 93 | 14.62B..... | AUG 2022 | 16.1..... | FEB 2024 |
| 14.28..... | 11 Jun 93 | 14.63..... | AUG 2022 | 16.2..... | FEB 2024 |

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| 16.3 | FEB 2024 | 20.2 | AUG 2019 | 23.26 | DEC 2021 |
| 16.4 | FEB 2024 | | | 23.27 | DEC 2021 |
| 16.5 | FEB 2024 | 21.i | AUG 2019 | 23.28 | DEC 2021 |
| 16.6 | FEB 2024 | 21.ii | AUG 2019 | 23.29 | SEP 2023 |
| 16.7 | FEB 2024 | 21.1 | AUG 2019 | 23.30 | SEP 2023 |
| 16.8 | FEB 2024 | 21.2 | AUG 2019 | 23.31 | SEP 2023 |
| | | | | 23.32 | SEP 2023 |
| 17.i | FEB 2024 | 22.i | AUG 2019 | 23.33 | SEP 2023 |
| 17.ii | FEB 2024 | 22.ii | AUG 2019 | 23.34 | SEP 2023 |
| 17.1 | FEB 2024 | 22.1 | AUG 2019 | 23.35 | DEC 2021 |
| 17.2 | FEB 2024 | 22.2 | AUG 2019 | 23.36 | DEC 2021 |
| 17.3 | FEB 2024 | | | 23.37 | FEB 2024 |
| 17.4 | FEB 2024 | 23.i | SEP 2023 | 23.38 | FEB 2024 |
| 17.5 | FEB 2024 | 23.ii | SEP 2023 | 23.39 | FEB 2024 |
| 17.6 | FEB 2024 | 23.1 | DEC 2021 | 23.40 | FEB 2024 |
| | | 23.2 | DEC 2021 | 23.41 | DEC 2021 |
| 18.i | FEB 2024 | 23.3 | DEC 2021 | 23.42 | DEC 2021 |
| 18.ii | FEB 2024 | 23.4 | DEC 2021 | 23.43 | DEC 2021 |
| 18.1 | FEB 2024 | 23.5 | AUG 2022 | 23.44 | DEC 2021 |
| 18.2 | FEB 2024 | 23.6 | AUG 2022 | 23.45 | FEB 2024 |
| 18.3 | FEB 2024 | 23.7 | SEP 2023 | 23.46 | FEB 2024 |
| 18.4 | FEB 2024 | 23.8 | SEP 2023 | | |
| 18.5 | MAR 2024 | 23.9 | SEP 2023 | 24.i | SEP 2023 |
| 18.6 | MAR 2024 | 23.10 | SEP 2023 | 24.ii | SEP 2023 |
| 18.7 | MAR 2024 | 23.11 | FEB 2024 | 24.1 | AUG 2022 |
| 18.8 | MAR 2024 | 23.12 | FEB 2024 | 24.2 | AUG 2022 |
| 18.9 | FEB 2024 | 23.13 | SEP 2023 | 24.3 | AUG 2022 |
| 18.10 | FEB 2024 | 23.14 | SEP 2023 | 24.4 | AUG 2022 |
| 18.11 | FEB 2024 | 23.15 | DEC 2021 | 24.5 | AUG 2022 |
| 18.12 | FEB 2024 | 23.16 | DEC 2021 | 24.6 | AUG 2022 |
| | | 23.17 | DEC 2021 | 24.7 | AUG 2022 |
| 19.i | AUG 2019 | 23.18 | DEC 2021 | 24.8 | AUG 2022 |
| 19.ii | AUG 2019 | 23.19 | DEC 2021 | 24.9 | AUG 2022 |
| 19.1 | AUG 2019 | 23.20 | DEC 2021 | 24.10 | AUG 2022 |
| 19.2 | AUG 2019 | 23.21 | DEC 2021 | 24.11 | SEP 2023 |
| | | 23.22 | DEC 2021 | 24.12 | SEP 2023 |
| 20.i | AUG 2019 | 23.23 | DEC 2021 | 24.13 | SEP 2023 |
| 20.ii | AUG 2019 | 23.24 | DEC 2021 | 24.14 | SEP 2023 |
| 20.1 | AUG 2019 | 23.25 | DEC 2021 | 24.15 | SEP 2023 |

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| 24.16 | SEP 2023 | 27.22 | SEP 2023 | 28.36 | DEC 2021 |
| | | | | 28.37 | DEC 2021 |
| 25.i | AUG 2019 | 28.i | DEC 2021 | 28.38 | DEC 2021 |
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| 25.2 | AUG 2019 | 28.2 | DEC 2021 | 28.41 | DEC 2021 |
| | | 28.3 | DEC 2021 | 28.42 | DEC 2021 |
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| 26.ii | FEB 2024 | 28.5 | DEC 2021 | 28.44 | DEC 2021 |
| 26.1 | FEB 2024 | 28.6 | DEC 2021 | | |
| 26.2 | FEB 2024 | 28.7 | DEC 2021 | 29.i | AUG 2019 |
| 26.3 | FEB 2024 | 28.8 | DEC 2021 | 29.ii | AUG 2019 |
| 26.4 | FEB 2024 | 28.9 | DEC 2021 | 29.1 | AUG 2019 |
| 26.5 | FEB 2024 | 28.10 | DEC 2021 | 29.2 | AUG 2019 |
| 26.6 | FEB 2024 | 28.11 | DEC 2021 | | |
| | | 28.12 | DEC 2021 | 30.i | DEC 2021 |
| 27.i | SEP 2023 | 28.13 | DEC 2021 | 30.ii | DEC 2021 |
| 27.ii | SEP 2023 | 28.14 | DEC 2021 | 30.1 | DEC 2021 |
| 27.1 | SEP 2023 | 28.15 | DEC 2021 | 30.2 | DEC 2021 |
| 27.2 | SEP 2023 | 28.16 | DEC 2021 | 30.3 | DEC 2021 |
| 27.3 | SEP 2023 | 28.17 | DEC 2021 | 30.4 | DEC 2021 |
| 27.4 | SEP 2023 | 28.18 | DEC 2021 | 30.5 | DEC 2021 |
| 27.5 | SEP 2023 | 28.19 | DEC 2021 | 30.6 | DEC 2021 |
| 27.6 | SEP 2023 | 28.20 | DEC 2021 | 30.7 | DEC 2021 |
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| 27.15 | SEP 2023 | 28.29 | DEC 2021 | 30.16 | DEC 2021 |
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| 27.18 | SEP 2023 | 28.32 | DEC 2021 | 30.19 | DEC 2021 |
| 27.19 | SEP 2023 | 28.33 | DEC 2021 | 30.20 | DEC 2021 |
| 27.20 | SEP 2023 | 28.34 | DEC 2021 | 30.21 | DEC 2021 |
| 27.21 | SEP 2023 | 28.35 | DEC 2021 | 30.22 | DEC 2021 |

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| 30.23 | DEC 2021 | 36.10 | AUG 2019 | 37.30 | AUG 2019 |
| 30.24 | DEC 2021 | | | 37.31 | AUG 2019 |
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| 31.i | AUG 2019 | 37.ii | FEB 2024 | 37.33 | FEB 2024 |
| 31.ii | AUG 2019 | 37.1 | JAN 2021 | 37.34 | FEB 2024 |
| 31.1 | AUG 2019 | 37.1A | JAN 2021 | | |
| 31.2 | AUG 2019 | 37.1B | SEP 2023 | 38.i | AUG 2019 |
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| 32.i | AUG 2019 | 37.2A | SEP 2023 | 38.1 | AUG 2019 |
| 32.ii | AUG 2019 | 37.2B | SEP 2023 | 38.2 | AUG 2019 |
| 32.1 | AUG 2019 | 37.2C | AUG 2022 | 38.3 | AUG 2019 |
| 32.2 | AUG 2019 | 37.2D | AUG 2022 | 38.4 | AUG 2019 |
| | | 37.3 | AUG 2019 | 38.5 | AUG 2019 |
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| 33.ii | AUG 2019 | 37.5 | AUG 2019 | 38.7 | AUG 2019 |
| 33.1 | AUG 2019 | 37.6 | AUG 2019 | 38.8 | AUG 2019 |
| 33.2 | AUG 2019 | 37.7 | DEC 2021 | 38.9 | AUG 2019 |
| | | 37.8 | DEC 2021 | 38.10 | AUG 2019 |
| 34.i | AUG 2019 | 37.9 | JAN 2021 | 38.11 | AUG 2019 |
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| 35.2 | AUG 2019 | 37.17 | DEC 2021 | 38.19 | AUG 2019 |
| | | 37.18 | DEC 2021 | 38.20 | AUG 2019 |
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| 36.ii | AUG 2019 | 37.20 | AUG 2019 | 38.22 | AUG 2019 |
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| 36.2 | AUG 2019 | 37.22 | AUG 2019 | 38.24 | AUG 2019 |
| 36.3 | SEP 2023 | 37.23 | AUG 2019 | 38.25 | AUG 2019 |
| 36.4 | SEP 2023 | 37.24 | AUG 2019 | 38.26 | AUG 2019 |
| 36.5 | SEP 2023 | 37.25 | AUG 2019 | 38.27 | AUG 2019 |
| 36.6 | SEP 2023 | 37.26 | AUG 2019 | 38.28 | AUG 2019 |
| 36.7 | JAN 2021 | 37.27 | AUG 2019 | 38.29 | AUG 2019 |
| 36.8 | JAN 2021 | 37.28 | AUG 2019 | 38.30 | AUG 2019 |
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| 39.1 | AUG 2019 | | | | |
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| | | | | | |
| 40.i | AUG 2019 | | | | |
| 40.ii | AUG 2019 | | | | |
| 40.1 | AUG 2019 | | | | |
| 40.2 | AUG 2019 | | | | |
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