## CONSTRUCTION

RBC stud type airframe track rollers have been designed for specific use on track type or cam-controlled equipment when cantilever mounting is desired.

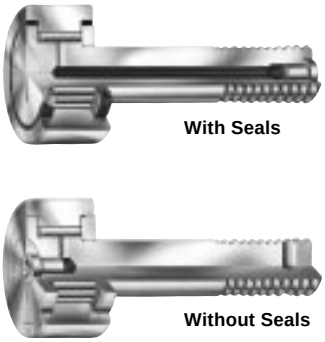
Each non-separable unit comprises an outer ring, a full complement of needle rollers, stud, and washer. The O.D. of the outer ring is chromium plated in accordance with the AMS-QQ-C-320, Class 2 specifications to a minimum thickness of .0004 in. All other exposed surfaces are cadmium or zinc-nickel plated. The sealed track rollers have seals made from a special plastic or acetal resin.

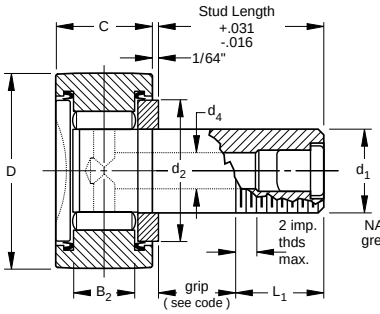
Track rollers are available with cylindrical or crowned outer rings. Crowned track rollers reduce the effect of uneven bearing loading resulting from deflection, bending, or misalignment in mounting. A track roller with a cylindrical outer ring is identified by the prefix letters HRS. A track roller with a crowned outer ring has a letter "C" added to the end of the prefix code (i.e., HRSC).

Normally, the track rollers are prepackaged with a low temperature aircraft grease meeting MIL-PRF-81322 specification, when specified.

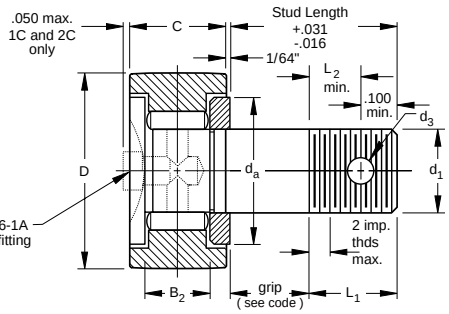
## DIMENSIONS

Dimensions are for the finished bearing after chrome and cadmium plating. No standard stud length is shown in the tables because the grip length is variable in 1/16 in. increments, coded in the bearing number. Since many combinations of length and type are possible for each track roller size, almost every track roller ordered is a special bearing. See note 3 below for thread specifications.




HRS (C) Type
CTR Construction Refinements




HRS (C) Type
CF Construction Refinements

# SPECIFICATIONS AND ORDERING INFORMATION

## BEARING DIMENSIONS

| Bearing Designation | MS21432 Dash No.(4) | Former NAS 562 Number | $d_1$ Stud Diam. +.0000 -.0015 in. | $d_1$ Stud Diam. +.000 -.038 mm | D O.D.(1) +0.0010 -.0005 in. | D O.D.(1) +.025 -.013 mm | C O.R. Width +.000 -.005 in. | C O.R. Width +.000 -.13 mm | $L_2$ min | $d_2$ min. | $B_2$ Track Contact Width(2) min. | Preferred Max. Grip Length | $L_1$ Thread Length (ref.) | Thread Size(3) | $d_3$ Cotter Pin Hole Diam. (ref.) | $d_4$ dia. (ref.) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| HRS1C HRSC1C | MS 21432-3 | NAS 562-3 | 0.1900 | 4.826 | 0.5000 | 12.700 | 0.281 | 7.14 | 0.211 | 0.323 | 0.230 | 5/8 | 0.344 | 10-32 | 0.070 | none |
| HRS2C HRSC2C | MS 21432-4 | NAS 562-4 | 0.2500 | 6.350 | 0.6875 | 17.463 | 0.281 | 7.14 | 0.224 | 0.418 | 0.230 | 15/16 | 0.344 | 1/4-28 | 0.076 | 0.076 |
| HRS3C HRSC3C | MS 21432-5 | NAS 562-5 | 0.3120 | 7.925 | 0.7500 | 19.050 | 0.344 | 8.74 | 0.234 | 0.494 | 0.290 | 1 1/4 | 0.359 | 5/16-24 | 0.076 | 0.076 |
| HRS4C HRSC4C | MS 21432-6 | NAS 562-6 | 0.3750 | 9.525 | 0.8750 | 22.225 | 0.469 | 11.91 | 0.265 | 0.575 | 0.380 | 1 5/8 | 0.359 | 3/8-24 | 0.106 | 0.106 |
| HRS5C HRSC5C | MS 21432-7 | NAS 562-7 | 0.4370 | 11.100 | 1.0000 | 25.400 | 0.531 | 13.49 | 0.283 | 0.680 | 0.430 | 1 3/4 | 0.422 | 7/16-20 | 0.106 | 0.106 |
| HRS6C HRSC6C | MS 21432-8 | NAS 562-8 | 0.5000 | 12.700 | 1.1250 | 28.575 | 0.656 | 16.66 | 0.314 | 0.744 | 0.530 | 1 3/4 | 0.422 | 1/2-20 | 0.106 | 0.106 |

(1) Tolerance for crowned outer ring O.D. is +.0010,-.0015.

(2) Applies to cylindrical outer ring design only.

(3) All threads conform to SAE AS-8879 specification, UNJF series and Class 3A. The last two threads on the stud are imperfect threads.

(4) HRSC bearings meet the requirements of SAE AS-21447.



### BEARING NUMBER

Bearing numbers for RBC Airframe HRSC and HRS track rollers are based on the ABMA identification system. Each complete bearing number comprises three sections of letter and numeral codes which indicate, in this order, basic type and size, construction refinements, and grip length. The sections of the number are contiguous and not separated by spaces or dashes. Designers should familiarize themselves with the numbering system and use the proper sequence of letters and numerals in print specifications and correspondence.

**Section 1 : Basic Bearing Number** The letters HRS and HRSC followed by size designations (1C, 2C, etc.) relate to the dimensions given in the tabulation above.

**Section 2: Construction Refinements** Additional letters, which must appear in the sequence below, indicate special optional features:

F– lubricator in flanged end of stud.

T– lubricator in threaded end of stud; cotter pin hole omitted. (Note: the HRS1C stud is too small to permit lubrication through the threaded end.)

K– stud slotted to receive an MS 27111 washer.

A– no cotter pin hole.

R– sealed.

**Section 3: Grip Length Number** A number indicating the grip length in increments of 1/16 in. Tolerance on grip length is ±.016 in. The nominal stud length is the sum of the nominal grip length and thread length (column L1).

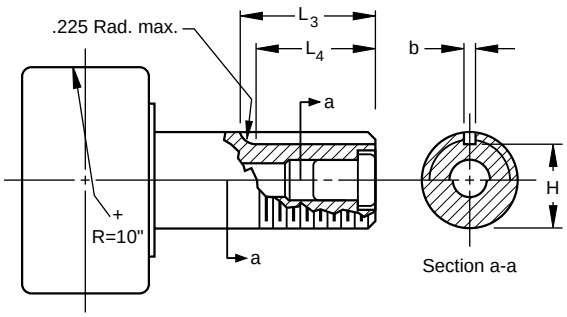
## MOUNTING

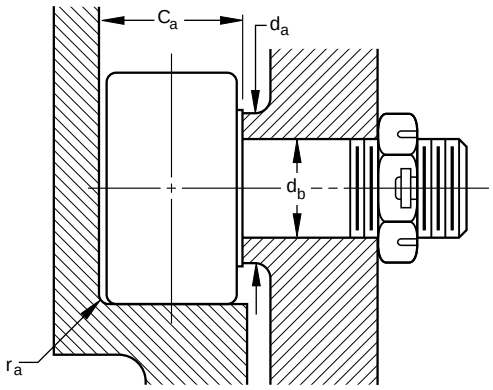
The bore diameter for the stud is listed in column $d_b$. Other mounting requirements are track fillet radius ($r_a$), minimum overhang space ($C_a$) and minimum clamping diameter ($d_a$). See footnotes 1 and 2 below for additional requirements.

## LOAD RATINGS

To utilize a track roller properly, three different capacities must be considered: the capacity of the material on which the track roller will roll (see Note 3), the capacity of the bearing elements to carry the load (see Note 4), and the capacity of the bearing elements to withstand the maximum radial loads (see Note 5).

Before final bearing selection is made please consult the RBC Aerospace Engineering Department.




## SPECIFICATIONS AND ORDERING INFORMATION

### MOUNTING DIMENSIONS

| $L_4$ +0.030 -.000 | $L_3$ (ref.) | b ±.0020 | H ±.0030 | Weight, Pounds Approx. gln=Grip Length Number | $d_b$ Bore Diameter for stud max. | $d_b$ Bore Diameter for stud min. | Mounting Dimensions, Inches: $r_a$ Track Fillet Radius (max.) | Rec. Clamping Torque (max.) lb.-in.[1] | $C_a$* Min. Overhang Space | $d_a$ Clamping Diameter (min.) | Bearing Size No. | Load Ratings, Pounds: Bearing Capacity: Track Capacity 40HRc Steel[3] | as a Track Roller[4] | Limit Load Rating[5] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| n.a. | n.a. | n.a. | n.a. | .014 + (gln x .0005) | 0.1905 | 0.1900 | 0.010 | 8 | 0.313 | 0.297 | 1 | 385 | 395 | 790 |
| 0.375 | 0.534 | 0.0635 | 0.2143 | .031 + (gln x .0009) | 0.2505 | 0.2500 | 0.010 | 20 | 0.313 | 0.359 | 2 | 525 | 470 | 940 |
| 0.390 | 0.546 | 0.0635 | 0.2768 | .043 + (gln x .0014) | 0.3120 | 0.2500 | 0.010 | 40 | 0.376 | 0.422 | 3 | 725 | 830 | 1660 |
| 0.390 | 0.572 | 0.0947 | 0.3236 | .081 + (gln x .0020) | 0.3755 | 0.3750 | 0.025 | 55 | 0.501 | 0.500 | 4 | 1100 | 1360 | 2720 |
| 0.453 | 0.635 | 0.0947 | 0.3861 | .125 + (gln x. .0026) | 0.4375 | 0.4370 | 0.025 | 150 | 0.563 | 0.562 | 5 | 1425 | 1930 | 3860 |
| 0.453 | 0.662 | 0.1260 | 0.4330 | .190 + (gln x. .0035) | 0.5005 | 0.5000 | 0.040 | 205 | 0.688 | 0.625 | 6 | 1975 | 3040 | 6080 |

[1] The maximum recommended clamping torque is based on lubricated threads. If threads are dry, the torque values listed may be doubled.

[2] The edge of the housing which supports the stud shank should be as sharp as possible, without burrs, and square with the stud centerline.

[3] Track capacity is critical with respect to bearing rolling capacity. Increase in track hardness will increase track capacity. Never exceed bearing capacity as a track roller under dynamic conditions.

[4] The highest load that can be applied to a bearing for a life of 20,000 revolutions, L10.

[5] The limit load is the maximum radial load which can be applied to a bearing without impairing the subsequent functioning of the bearing in airframe applications. To realize this rating fully, compensation must be provided for stud deflection in order to assure full track contact under load. The static fracture load (Aircraft Static Capacity) is not less than 1.5 times the limit load rating.

### BEARING NUMBER EXAMPLES (RBC WITH MS EQUIVALENTS)

**RBC-ABMA HRS3CT7 — equivalent to MS 21432-5T7**

Track roller with .7500 in. outer ring O.D.; .344 in. outer ring width; .3120 in. stud diameter; lubricator in threaded end of stud; cotter pin hole omitted; and a 7 /16 in. grip length.

**RBC-ABMA HRSC4CFR6 — equivalent to MS 21477-6F6**

Track roller with .8750 in. outer ring O.D.; .469 in. outer ring width; .3750 in. stud diameter; lubricator in threaded end of stud; .106 in. diameter cotter pin hole located in threaded end of stud; sealed; and a 6 /16 in. grip length.

**RBC-ABMA HRS2CTK3 — no equivalent to MS 21432**

Track roller with .6875 in. outer ring O.D.; .281 in. outer ring width; .2500 in. stud diameter; lubricator in threaded end of stud. Stud slotted to receive an MS 27111 key washer; and a 3 /16 in. grip length.

*The NAS 516-1A grease fitting is flush or indented on all sizes except HRS1CF and HRS2CF, where it protrudes .050 in. Accordingly, when these two sizes are mounted, dimension Ca must be adjusted to accommodate the slight protrusion.