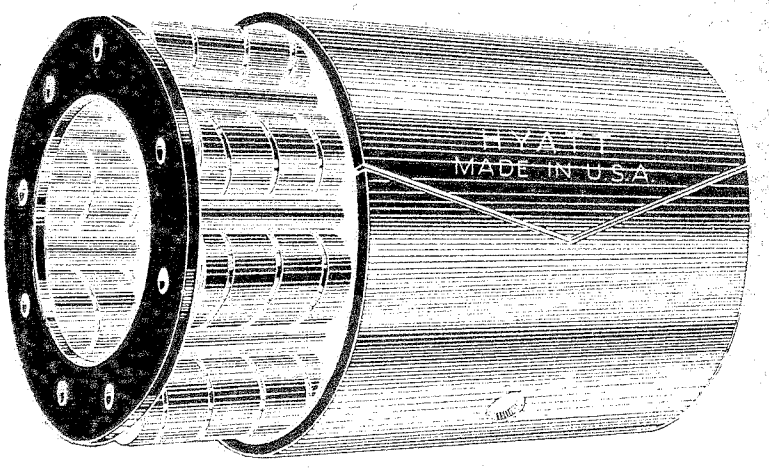
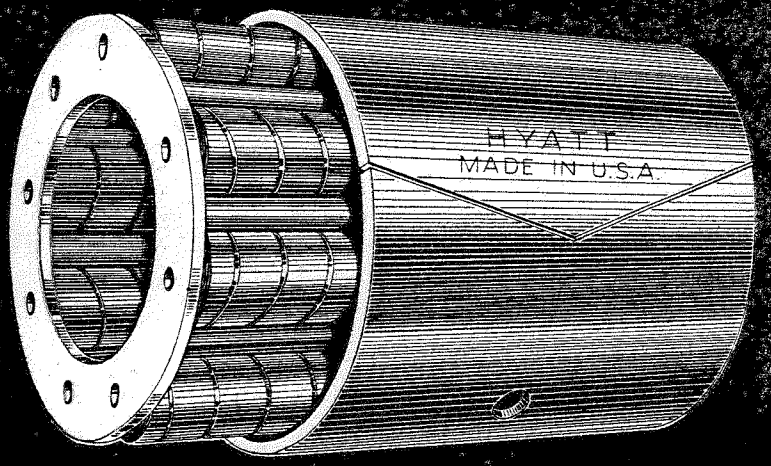
HYATT



WOUND ROLLER

SPLIT RACE BEARINGS

HYATT

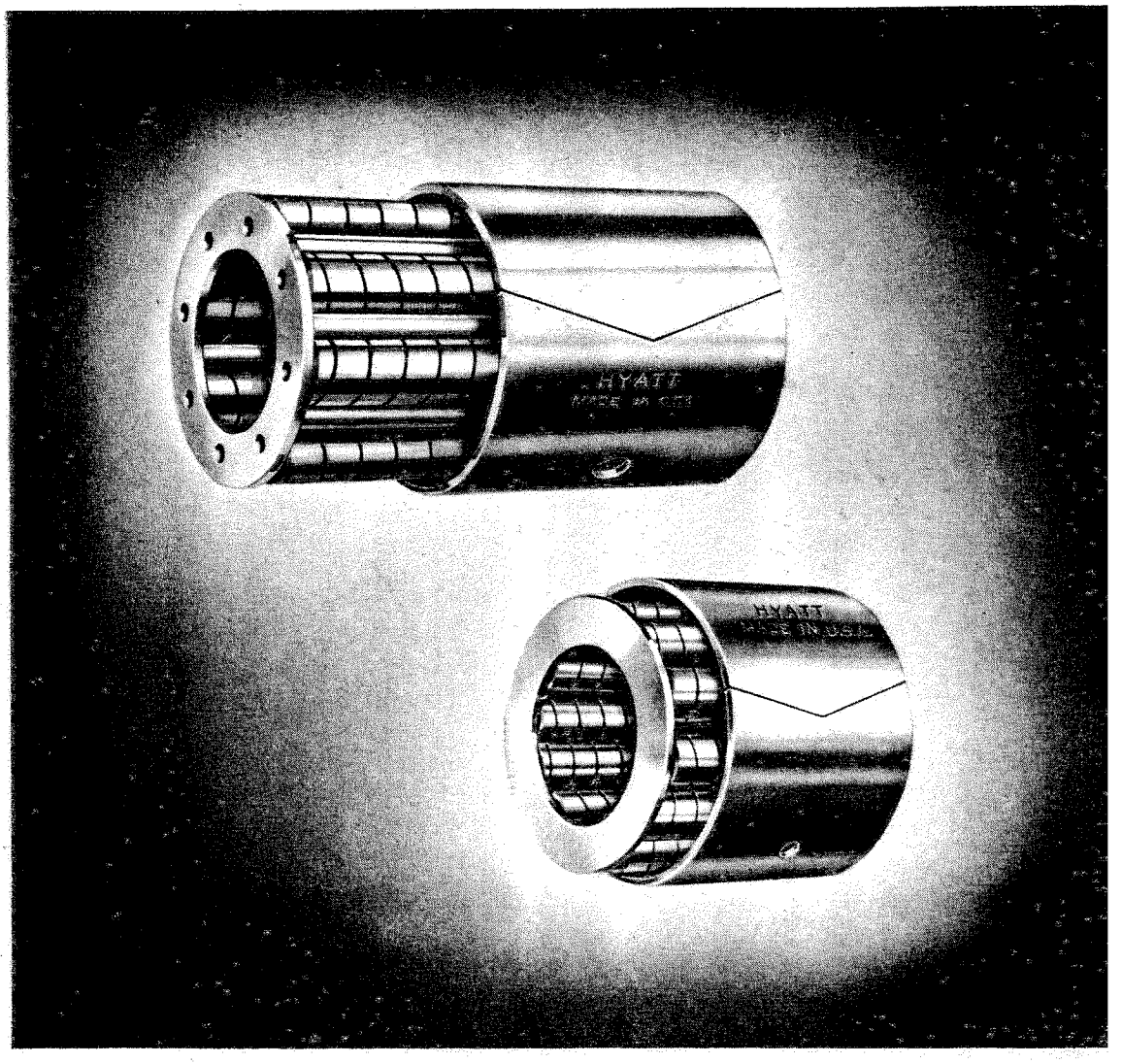


WOUND ROLLER
SPLIT RACE BEARINGS

HYATT
WOUND ROLLER SPLIT RACE BEARINGS
CATALOG NO. 346

HYATT BEARINGS DIVISION
GENERAL MOTORS CORPORATION
HARRISON, N. J.
CHICAGO
DETROIT
PITTSBURGH
OAKLAND, CALIF.

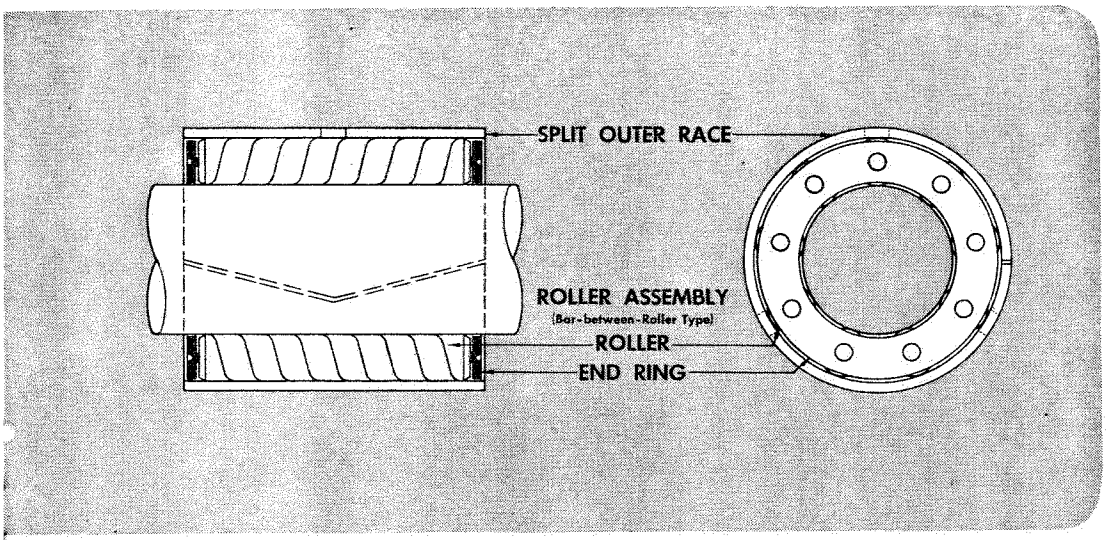
CONTENTS

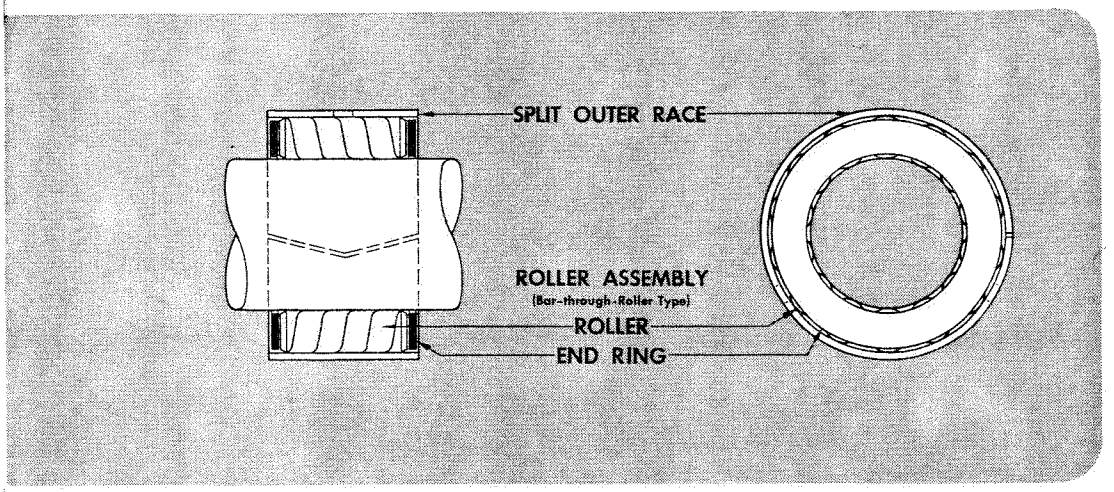


HYATT WOUND ROLLER SPLIT RACE BEARINGS

These bearings are designed to operate directly upon the surface of commercial fractional size shafting. They are of the separable type, being composed of a roller assembly and an outer race. The outer race assembles into the housing bore and serves as the outer operating surface for the rollers.

Bearings of this type have a long record of successful performance in industrial trucks, casters, conveyors, mine cars and similar types of equipment where bearing space is not at a premium and speeds do not exceed 1000 rpm.





Roller Assembly

The roller assembly consists of rollers and a cage. The rollers are spaced and held together by the cage.

There are two types of roller assembly: the alternate-bar-and-roller type, and the full-complement type—both shown in cross section above. In the former, the rollers and bars alternate, the rollers being assembled on projecting knobs punched in the end ring. Bearings of this type compose the 18,000 and 49,000 series.

In the full-complement type bearing, the bars pass through the hollow rollers. This permits a "full-complement" of rollers, thereby providing the maximum number of rollers that can be assembled in a given pitch circle. These bearings form the 40,000 series.

Rollers

The distinctive Hyatt rollers are hollow cylinders, formed by helically winding strips of alloy steel, which are then cut to length, heat treated and ground to close limits. This treatment results in high resistance to shocks, abrasion and fatigue.

The rollers are wound with both right hand and left hand turns and are assembled alternately in the bearing. This arrangement has the effect of sweeping the lubricant back and forth across the race surface.

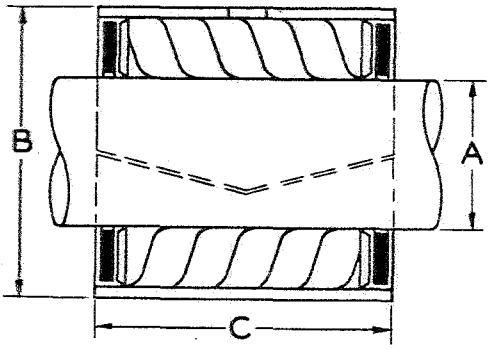
Cage

The rollers are kept in proper alignment and uniformly spaced by the cage or retainer. This consists of two pressed steel end rings, rigidly held in parallel and concentric position by round steel spacing bars. The ends of the bars are riveted in countersunk holes in the end rings.

Outer Race

The split outer race is made of a strip of specially finished medium carbon steel, rolled in cylindrical form. The joint is in the form of an obtuse angle so that the rollers pass over it without shock or noise. Before insertion in the housing bore, the split race will be found to have a slight outward spring which results in opening the joint somewhat. By pressing into the bore, the race is brought to true cylindrical form, the joint is closed to its proper width and the spring of the race practically eliminates any turning or creep in the bore.

SIZE DATA



BEARING NUMBER	DIMENSIONS									LOAD RATINGS				
	Shaft Diameter, Inches	Outside Diameter of Bearing, Inches	Bearing Width, Inches	SHAFT DIAMETER LIMITS		HOUSING BORE LIMITS		ROLLERS		These ratings are calculated for rotating shafts having a hardness of 169 Brinell. For stationary shafts and other shaft hardnesses see pages 6 and 7.				
				High Limit, Inches	Low Limit, Inches	High Limit, Inches	Low Limit, Inches	No.	Dia.	25 rpm	100 rpm	300 rpm	500 rpm	1000 rpm
	A	B	C											
18120			1							130	120	105	90	65
18122			1½							245	225	190	165	125
18125	1	1 15/16	2	1.000	0.997	1.940	1.938	7	3/8	350	325	275	240	180
18127			2½							465	430	365	315	235
18130			3							565	530	445	385	290
18135			4							780	730	610	530	400
18150			2							390	365	305	265	200
18152			2½							515	490	400	350	260
18155	1 1/8	2 3/16	3	1.125	1.122	2.190	2.188	8	7/16	630	600	490	425	320
18160			4							865	810	680	590	440
18175			2							405	380	315	275	200
18177			2½							535	500	415	360	265
18180	1 3/16	2 3/8	3	1.188	1.185	2.377	2.375	7	½	660	615	510	445	330
18185			4							910	855	710	610	455
18195			2							425	400	330	285	210
18197			2½							560	530	435	375	280
18200	1 1/4	2 7/16	3	1.250	1.247	2.440	2.438	8	½	690	645	535	460	340
18205			4							950	890	740	635	470
18220			2							465	435	355	305	225
18222			2½							615	570	470	405	295
18225	1 3/8	2 9/16	3	1.375	1.372	2.565	2.563	8	½	750	700	580	500	360
18230			4							1,040	970	800	690	500
18245			2							485	450	370	315	235
48247			2½							640	600	490	420	310
18250	1 7/16	2 3/4	3	1.438	1.435	2.752	2.750	8	9/16	790	730	600	515	380
18255			4							1,085	1,010	830	710	520
18260			5							1,390	1,295	1,060	905	670
18270			2							505	470	385	330	240
18272			2½							670	620	510	435	320
18275	1½	2 13/16	3	1.500	1.497	2.815	2.813	8	9/16	820	760	620	530	390
18280			4							1,130	1,050	860	735	540
18285			5							1,440	1,340	1,090	935	690
18295			2							540	500	405	350	255
18297			2½							715	660	540	465	340
18300	1 5/8	2 15/16	3	1.625	1.622	2.940	2.938	8	9/16	880	815	660	570	415
18305			4							1,210	1,125	915	785	575

BEARING NUMBER	DIMENSIONS									LOAD RATINGS				
	Shaft Diameter, Inches	Outside Diameter of Bearing, Inches	Bearing Width, Inches	SHAFT DIAMETER LIMITS		HOUSING BORE LIMITS		ROLLERS		These ratings are calculated for rotating shafts having a hardness of 169 Brinell. For stationary shafts and other shaft hardnesses see pages 6 and 7.				
				High Limit, Inches	Low Limit, Inches	High Limit, Inches	Low Limit, Inches	No.	Dia.	25 rpm	100 rpm	300 rpm	500 rpm	1000 rpm
	A	B	C											
18315			2							560	520	420	360	260
18320	1 11/16	3	3	1.688	1.685	3.003	3.000	9	9/16	910	840	680	585	420
18325			4							1,260	1,170	945	810	585
18340			2							580	535	435	370	265
18350	1 3/4	3 1/16	4	1.750	1.747	3.066	3.063	9	9/16	1,300	1,200	975	830	600
18355			5							1,650	1,515	1,240	1,060	765
18375	1 7/8	3 3/16	4	1.875	1.872	3.191	3.188	10	9/16	1,380	1,280	1,030	870	625
18380			5							1,770	1,640	1,320	1,120	800
18390			2							635	585	470	400	285
18395			3							1,030	950	765	650	465
18400	1 15/16	3 7/16	4	1.938	1.935	3.441	3.438	10	5/8	1,430	1,350	1,050	900	645
18405			5							1,820	1,680	1,350	1,140	820
18410			6							2,210	2,045	1,640	1,390	1,000
18420			3							1,060	980	785	665	475
18425	2	3 1/2	4	2.000	1.997	3.503	3.500	9	5/8	1,470	1,380	1,080	915	670
18430			5							1,870	1,725	1,380	1,170	840
49470	2 3/16	4 3/16	3	2.188	2.185	4.191	4.188	8	7/8	1,150	1,060	845	715	510
49480			5							2,020	1,860	1,480	1,250	890
49495			3							1,180	1,090	870	730	515
49500	2 1/4	4 1/4	4	2.250	2.247	4.253	4.250	8	7/8	1,630	1,505	1,200	1,000	715
49505			5							2,070	1,910	1,525	1,280	910
49510			6							2,500	2,315	1,850	1,550	1,100
49555	2 7/16	4 9/16	5	2.438	2.435	4.566	4.563	8	15/16	2,230	2,055	1,625	1,350	950
49573			3							1,300	1,200	940	780	550
49580	2 1/2	4 5/8	5	2.500	2.497	4.628	4.625	8	15/16	2,290	2,100	1,650	1,380	965
49585			6							2,800	2,570	2,020	1,680	1,175
49590			7							3,280	3,025	2,380	1,980	1,385
49650			4							1,940	1,775	1,385	1,160	790
49655	2 3/4	4 7/8	5	2.750	2.747	4.878	4.875	9	15/16	2,470	2,260	1,760	1,475	1,000
49660			6							3,000	2,750	2,150	1,800	1,225
49725			4							2,100	1,915	1,480	1,290	845
49730	3	5 1/4	5	3.000	2.996	5.254	5.250	9	1	2,680	2,450	1,890	1,570	1,070
49735			6							3,260	2,975	2,300	1,915	1,300
49740			7							3,840	3,505	2,710	2,260	1,525
40010			4							2,860	2,570	1,980	1,650	
40015	3 1/2	6 1/8	5	3.500	3.496	6.129	6.125	12	1 1/8	3,650	3,300	2,530	2,110	
40025			7							5,240	4,740	3,630	3,020	
40061			4							3,370	3,040	2,310	1,885	
40066	4	6 5/8	5	4.000	3.996	6.629	6.625	14	1 1/8	4,300	3,880	2,950	2,420	
40071			6							5,250	4,700	3,590	2,925	
40075			7							6,170	5,570	4,225	3,460	
40360			4							3,730	3,300	2,510	2,050	
40365	4 1/2	7 3/8	5	4.500	4.496	7.380	7.375	14	1 1/4	4,740	4,260	3,190	2,610	
40370			6							5,780	5,140	3,880	3,180	
40374			7							6,800	6,100	4,580	3,740	
40410			4							3,940	3,520	2,610	2,110	
40415	5	7 7/8	5	5.000	4.995	7.880	7.875	15	1 1/4	5,040	4,480	3,340	2,700	
40420			6							6,120	5,420	4,060	3,280	
40424			7							7,200	6,400	4,780	3,870	
40265			5							6,370	5,600	4,050	3,200	
40270	6	8 7/8	6	6.000	5.995	8.880	8.875	18	1 1/4	7,750	6,770	5,030	3,900	
40274			7							9,170	7,900	5,830	4,450	
40498	7	10 1/8	7	7.000	6.995	10.130	10.125	18	1 3/8	9,520	8,000	5,900	4,500	

ALL SIZES LISTED ARE IN PRODUCTION

BEARING SELECTION

Select bearings which will fulfill the load requirements of the application at the operating speed to be encountered from the tables on pages 4 and 5. The load ratings are based upon a shaft hardness of 169 Brinell, and upon a revolving shaft. When other conditions exist, and when temperature or service requirements may be severe, modifying factors must be used . . .

Shaft Hardness Factor

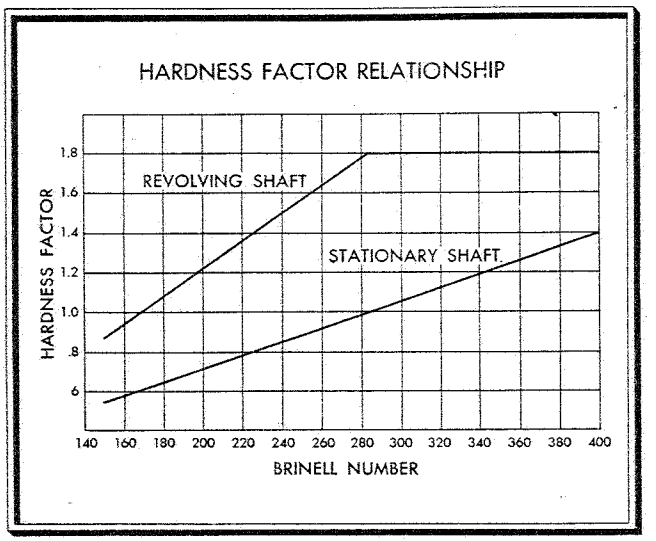
For shaft hardnesses other than 169 Brinell, a Hardness Factor corresponding to the shaft hardness is taken from the chart at right. This factor will depend upon whether the shaft is stationary or rotating. In either case, the applied load is divided by the Hardness Factor in order to determine the required bearing load rating.

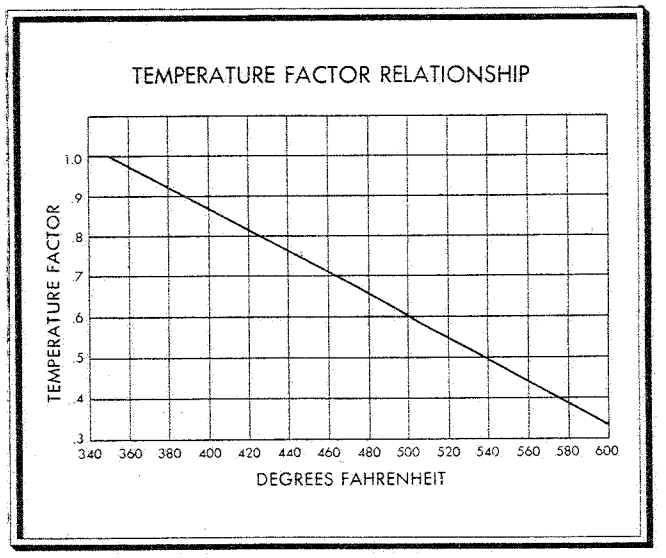
Temperature Factor

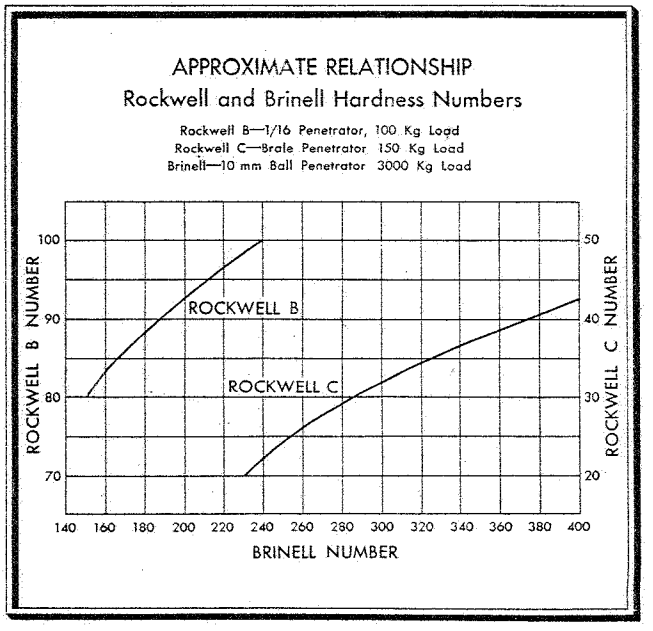
Temperatures up to approximately 350°F, have little or no effect upon the hardness of Hyatt Wound Roller Bearing parts. Above this, the temper of the material becomes affected with consequent decrease in hardness and in strength. It is therefore necessary to apply modifying factors to the bearing ratings, when temperatures above 350°F are encountered. The modifying factors are shown in the chart at right.

Service Factor

The Service Factor is intended to compensate for the type of load—whether continuous or variable, the presence of shocks or overloads, the degree to which the







bearing is protected from foreign matter, and the attention which it will receive. It is not possible to generalize service conditions into definite factors, so the accompanying table can serve only as a guide. When selecting a bearing size, the value of the applied load should be divided by the service factor.

Required Bearing Load Rating

The bearing load rating required for satisfactory bearing performance, is found by means of the following equation:

$$R = \frac{L}{AxBxC}$$

where

R = Required bearing load rating
L = Load imposed on bearing
A = Shaft hardness factor
B = Temperature factor
C = Service Factor

SERVICE FACTORS

Type of Equipment	Service Factor
Agricultural Implements	1.00 to 1.50
Belt Conveyors:	
Idlers with revolving shafts	.35 to .50
Idlers with stationary shafts	.25 to .35
Head, Tail, Bend Pulleys, etc.	1.0
Countershafts	1.0
Clutches	1.0
Crane: Hand Operated	1.0 to 2.5
Crane: Power Operated	1.0
Hoists	1.0 to 1.25
Industrial Cars	1.0 to 2.0
Pulleys	1.0
Textile equipment	1.0
Trolleys	.75 to 1.5
Trucks: Hand, 2 or 4 wheel	1.5 to 2.5
Trucks: Trailers	1.0 to 1.5
Trucks: Casters	1.5 to 2.0

LIST OF COMPONENT PARTS

The component parts, as well as complete bearings, are obtainable. This table lists the outer race and roller assembly number of each bearing.

Bearing Number	Roller Assembly Number	Outer Race	Bearing Number	Roller Assembly Number	Outer Race	Bearing Number	Roller Assembly Number	Outer Race
18120	17585	4400	18295	01185	4795	49573	46904	4716
18122	01076	4401	18297	01129	4796	49580	04341	4574
18125	16962	4430	18300	01105	4459	49585	04045	4617
18127	16965	4445	18305	16868	4509	49590	04030	4653
18130	16984	4466						
18135	01165	4537	18315	01097	4793	49650	04350	4930
			18320	01188	4467	49655	04351	4578
18150	01078	4425	18325	01190	4510	49660	04352	4621
18152	16959	4446						
18155	16845	4450	18340	16857	4791	49725	04003	4534
18160	16896	4500	18350	01142	4512	49730	04362	4582
			18355	01093	4560	49735	04032	4625
18175	01079	4426				49740	04037	4661
18177	01169	4447	18375	01046	4508			
18180	01085	4451	18380	01198	4556	40010	00386	4272
18185	01044	4501				40015	00387	4300
			18390	01200	4789	40025	00389	4349
18195	01173	4431	18395	01201	4469			
18197	01084	4448	18400	01203	4515	40061	00398	4273
18200	16963	4452	18405	01204	4563	40066	00376	4301
18205	16989	4502	18410	01205	4606	40071	00400	4331
						40075	00401	4350
18220	17927	4432	18420	01065	4470			
18222	16855	4438	18425	01208	4517	40360	00417	4274
18225	01042	4454	18430	01081	4565	40365	00418	4302
18230	16894	4504				40370	00419	4332
			49470	04327	4477	40374	00420	4347
18245	01176	4449	49480	46905	4568			
48247	46853	4799				40410	00429	4275
18250	01177	4456	49495	04334	4719	40415	00430	4303
18255	01179	4506	49500	04048	4522	40420	00431	4333
18260	01180	4554	49505	04083	4570	40424	00432	4348
			49510	04031	4613			
18270	16873	4435				40265	00490	4307
18272	17926	4797	49555	04029	4572	40270	00491	4312
18275	01075	4455				40274	00492	4357
18280	01087	4505						
18285	01183	4553				40498	00507	4235

INSTRUCTIONS FOR MOUNTING

Retainment of Bearing Parts in Correct Operating Position

Provision must be made in the housing design to retain the bearing in its proper position since both rollers and races are straight cylinders. This is done by providing a flat smooth surface, on both sides of the bearing, which extends sufficiently to cover approximately two-thirds of the roller diameter.

When the retaining surfaces project inward from the outer race or housing bore, the retainment is said to be of the "housing or outer race type." When the retaining surfaces project outward from the shaft the retainment is said to be of the "shaft or inner race type." The housing type retainment is simpler and more economical, but the design of adjacent parts usually determines which type should be adopted.

Care should be exercised to guard against diagonal or cross retainment where the retaining surface on one side is of the housing type and on the other side of the shaft type. With such incorrect retainment any considerable movement of the shaft, axially, will pinch the roller assembly between the two retainment surfaces and prevent the bearing from functioning properly. This is shown below.

Endwise Location of Shafts

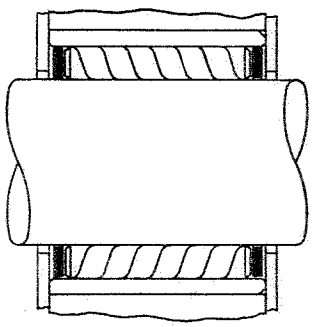
The Hyatt Bearing, of itself, provides no means of taking end thrust, being designed for radial loads only. It is necessary, therefore, to provide some means outside the bearing itself to locate the shaft in its correct lengthwise position. Plain thrust surfaces, preferably steel against cast iron, are sufficient for most applications.

Wheel and Pulley Stability

When Hyatt bearings are mounted in a wheel or pulley hub, the question of lateral stability of the wheel or pulley frequently supersedes the ordinary consideration of load. The two new elements to be considered are the diameter of the pulley or wheel, and the width of the pulley face. If a single bearing is used in a loose pulley hub, it must be at least as wide as the pulley face, must be placed centrally with respect to the face, and must not be shorter than 1/3 of the pulley diameter. A single bearing in a plain tread wheel or single flanged wheel must not be shorter than 1/3 of the wheel diameter, and if this ratio is used with single flanged wheels, the center line of the bearing must coincide with the track gauge line. If the bearing is as long as ½ the wheel diameter or longer, the center line of bearing must coincide with the center line of track.

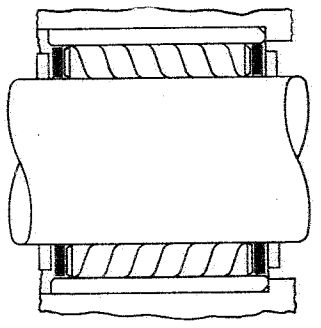
When the observance of these rules requires the use of a bearing longer than those available, two bearings with a spacer between are substituted. If the spacer width is equal to or greater than the width of one of the bearings, the permissible diameter of the wheel or pulley may be five times the combined width of both bearings and spacer. The permissible width of pulley face is the sum of the widths of the two bearings plus the width of the spacer.

TYPES OF RETAINMENT



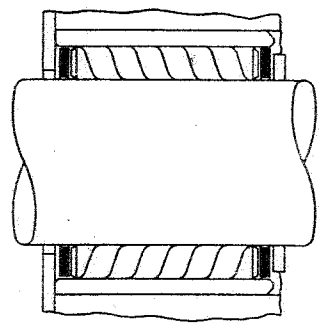
Housing or outer race type retainment

CORRECT



Shaft or inner race type retainment

CORRECT



Diagonal or cross retainment

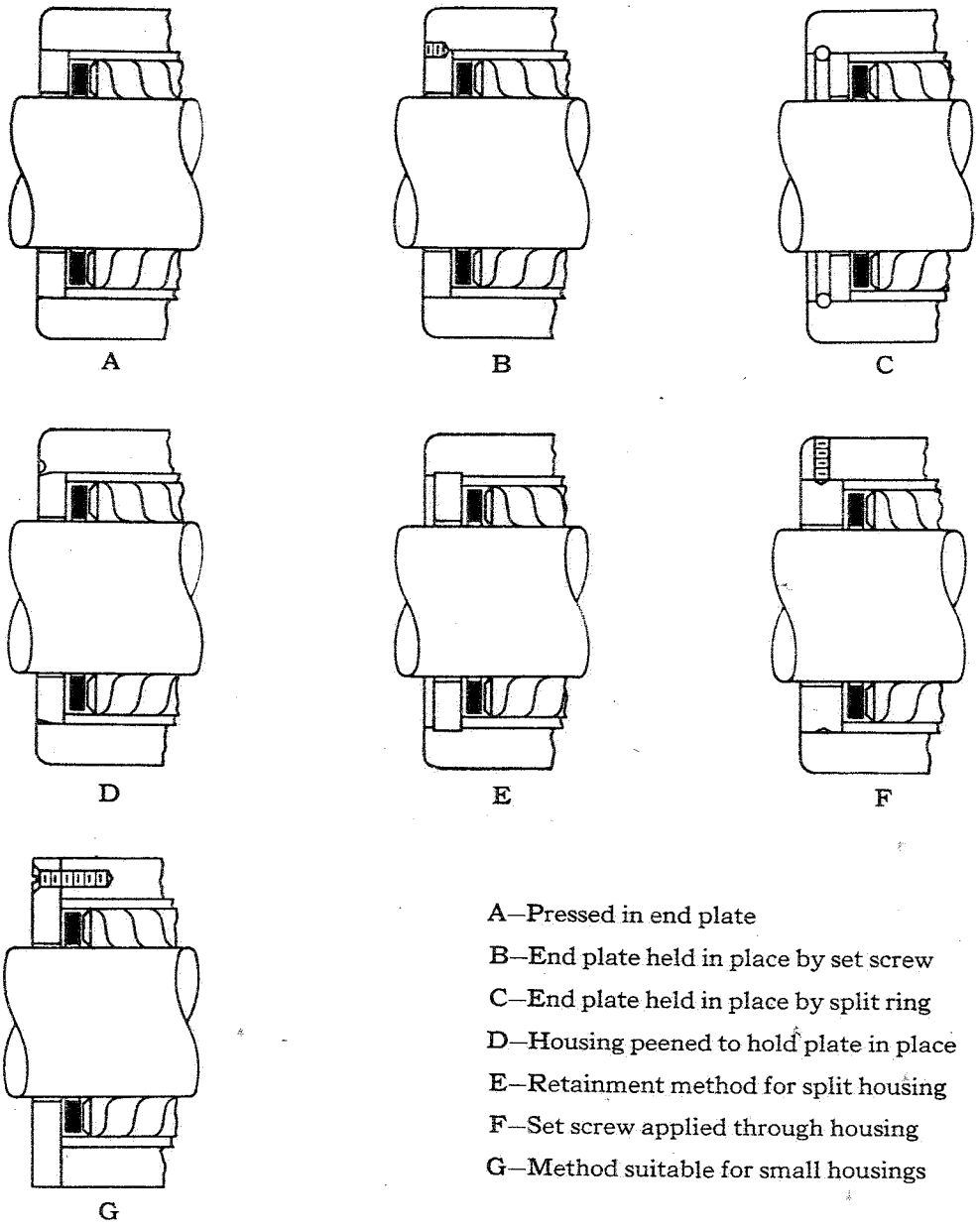
INCORRECT

Lubrication and Sealing

End plates which locate the outer race and roller assembly, also serve as seals to prevent the escape of lubricant and the entry of dust or dirt. Some methods of holding the end plates in the housing are shown here, the particular type to be used depending upon the circumstances of the application.

Plates may be stamped or cast and turned to size. A clearance of from $\frac{1}{64}$" to $\frac{1}{16}$" should be provided around the shaft, depending on shaft size. Where loose washers or plates are used outside the housing, the diameter of such plates should be large enough to bear not only on the bearing retainment plate, but also on the housing itself.

POSITIONING OF END PLATES IN HOUSING



A—Pressed in end plate

B—End plate held in place by set screw

C—End plate held in place by split ring

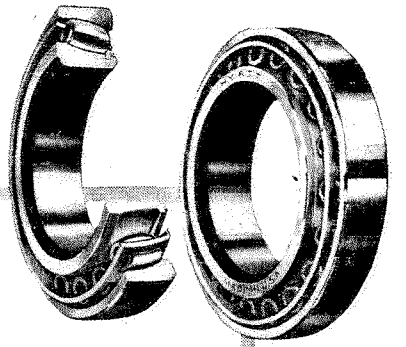
D—Housing peened to hold plate in place

E—Retainment method for split housing

F—Set screw applied through housing

G—Method suitable for small housings

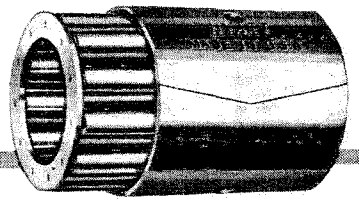
MORE THAN 7 TYPES MORE THAN 3,500 SIZES....



Hyatt Spherangular Roller Bearings

An angular contact, self-aligning bearing designed to sustain both radial and thrust loads. The operating surface of the outer race has a spherical contour, and the rollers and races make angular contact, insuring ideal distribution of load on roller and race surfaces even under conditions of misalignment or shaft deflection.

All radial and thrust loads are distributed on the curved roller paths over large areas of contact with the greatest load concentrated at the center or major diameter of the rollers. The absence of race shoulders avoids destructive pressures on roller ends.



Hyatt 90,000 Series Bearings

HP-90,000 series are two part bearings with split outer races and solid roller assemblies. They may operate directly upon the unmachined surface of cold rolled shafting. Maximum load rating may be realized with shafts of 400 Brinell hardness.

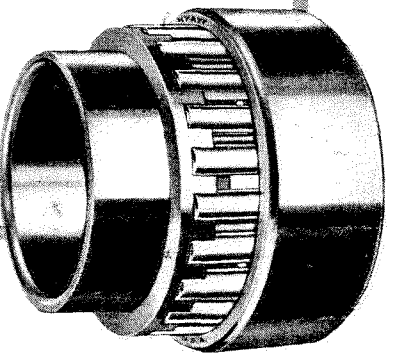
S-90,000 series are two part bearings composed of solid cylindrical, hardened and ground outer races and solid roller assemblies. Suitable for applications requiring higher load rating and accuracy than the HP-90,000 series. Commonly applied to ground shafts of 55C Rockwell hardness.

Roller assemblies only of both series are also available. Recommended where both operating surfaces may be hardened to 55C Rockwell minimum hardness, and ground to close limits.

Hyatt Industrial Inch Series Bearings

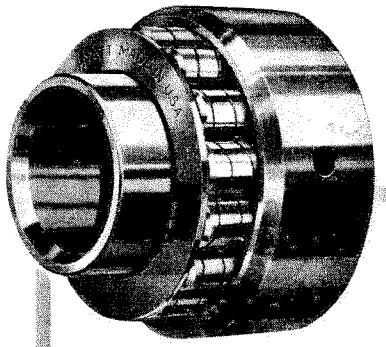
Designed for slow moving, heavily loaded machinery where, as in oil well or steel mill equipment, large diameter shafts are the rule. Available in fractional size bores for shafts from 4" diameter upwards.

Made up of three separable parts: outer race, roller assembly and inner race. Rollers are retained by a cage made up of bronze end rings held together and properly spaced by steel bars.



Hy-Load Solid Roller Bearings

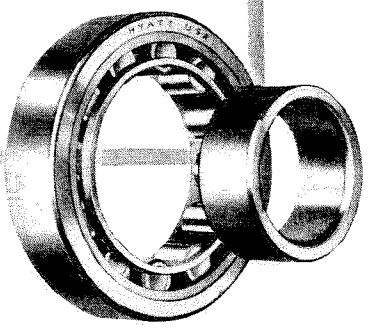
High capacity cylindrical roller bearings made in three dimensional series, wide and narrow widths, to standard AFBMA dimensions. There are ten major types—for radial loads, or light or intermittent thrust loads. Of the ten types, two have non-separable component parts, four have separable inner races, four have separable outer races, thus permitting flexibility in machine design and assembly procedures. Separable race can be omitted, and rollers operated directly on the machine surfaces, in instances where shaft or housing bore is of suitable hardness and finish.



Wound Roller Bearings With Solid Outer Races

Contains the distinctive Hyatt wound roller, formed by helically winding strips of alloy steel, heat treating and grinding to close limits. The races are straight cylinders of alloy steel. This combination results in a bearing possessing maximum resistance to shock, abrasion and fatigue effects, making it particularly suitable for the severest kinds of service.

Either or both races may be omitted by providing operating surfaces of sufficient hardness and suitable finish.

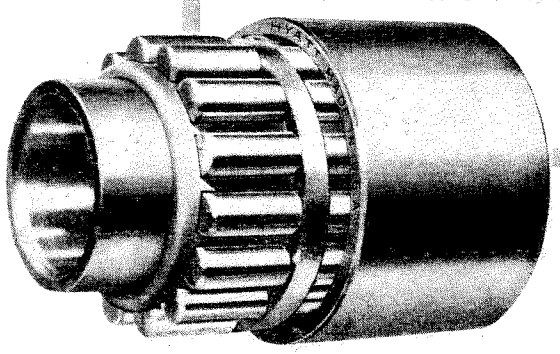


Hyatt Type J Railroad Bearings

Consist of cylindrical races and solid rollers operating in one-piece bronze separators. Rollers are formed from alloy bar stock and races from alloy steel forgings, properly heat-treated and ground to close limits.

The inner race is shrunk on the journal portion of the axle, and becomes an integral part of the axle. Wheel work may be done without disturbing the race.

There are two roller assemblies to each journal. The roller separators are bronze castings of wear-resisting alloy composition, and are centered on the inner race to insure concentric operation at high speeds.



THERE'S A HYATT ROLLER BEARING FOR EVERY APPLICATION.....

World-Wide Sales-Engineering Network ....At Your Disposal

FOR MORE THAN 50 YEARS, Hyatt sales engineers have been literally "walking encyclopedias" of bearing information for manufacturers of machines and equipment, and their designers.

During this time these men have accumulated a tremendous fund of technical knowledge of the application of Hyatt Roller Bearings. In this vast reservoir of experience, there may already be solutions to mechanical obstacles that you encounter in the products you are developing or improving today. Even if there has not been a problem to parallel yours, they are ready to help you find the right answer . . . one that will contribute to better design and better operation.

Consultation with Hyatt engineers is easy to arrange and involves no obligation.

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