

O-Rings—70 Durometer Nitrile

1. SCOPE

1.1 This standard covers material and dimensional requirements for O-Rings used in hydraulic applications fabricated from 70 Durometer Nitrile (Buna N) that conform to SAE J120 Class 1. The O-Rings conform to standard dash sizes.

1.2 This standard does not govern O-Rings for use with hydraulic fittings (see FNHA-1-D-170.00).

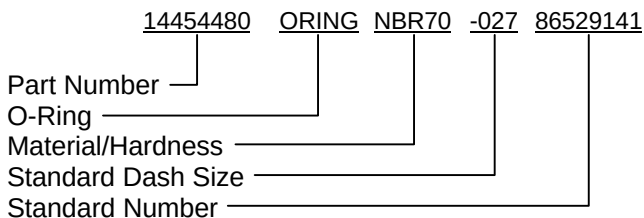
1.3 In Tables 5–9, the shaded part numbers are preferred. All other part numbers are non-preferred.

1.4 Part numbers marked with (*) in Tables 5–7 are controlled by Fiat Auto Standard 14618. Although original control of the parts is by way of Fiat Auto Standard, North American Engineering and Purchasing are to use the FNHA Standard for part selection and purchasing.

1.5 O-Rings that do not have assigned New Holland part numbers are indicated by (—) in the part number column. Please see the appropriate Standards Engineer when a O-Ring of this size is required.

2. DESIGNATION

2.1 Typical O-Ring call-out shall be:



NOTE: This typical description is required for use in all company wide computer generated documents. The description on hand drawn assembly drawings should follow the same practice.

2.2 When requesting a new part number, refer to the instructions in standard FNHA-3-A-005.00 (86505299).

NOTE: All O-Rings that are not eligible to be included in this standard shall have drawings. A standard drawing form is available on CAD.

3. RELATED SPECIFICATIONS

3.1 REFERENCE STANDARDS

SAE J120—Rubber Rings for Automotive Application

SAE AS568—Aerospace Size Standard for O-Rings

3.2 This standard replaces the following company standards:

New Holland	2.31.4
Versatile	1-B-153

4. REQUIREMENTS

4.1 MATERIALS

4.1.1 The material shall be 70 Durometer Nitrile (Buna N), with properties as specified in Table 1.

4.1.2 Material operating temperature shall range from –35°F to 250°F (–37°C to 121°C).

					NAME	STD ORING NBR70 DURO		
					 NEW HOLLAND			ENGINEERING SPECIFICATION
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ALL	R	BJF	118965	16JUL02				
FRAME NO.	REV	BY	ECN NO.	DATE				
APP.	DRAWN	JCB	3/96					
KHH 10/96	CHECKED							

4.1.3 Nitrile (Buna N) can be used for most general applications. **Specifically, Nitrile (Buna N) is not to be used when exposure to automotive brake fluid is possible. Consult an O-Ring supplier if there is any doubt concerning appropriate material selection.**

4.2 MECHANICAL DIMENSIONS

4.2.1 O-Rings shall conform to the dimensions and tolerances in Figure 1 and Tables 5, 6, 7, 8, and 9.

4.2.2 For standardization purposes, O-Ring sizes are grouped according to an industry standard system identified in Table 2. Table 2 also contains the table and page number where specific size ranges are located in this standard.

4.2.3 The following O-Ring standard sizes are not generally used for dynamic seals and are not generally recommended for such service:

-013 to -045
-117 to -163
-223 to -281

In special cases where space or other factors dictate the desirability of small cross-sections, these sizes should be incorporated into a design only after careful engineering analysis.

4.3 CONCENTRICITY

Concentricity requirements for hydraulic cylinder applications are located in Table 3. These values are to be within total indicator reading.

4.4 CLEARANCE

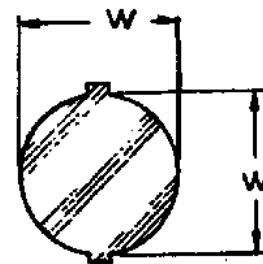
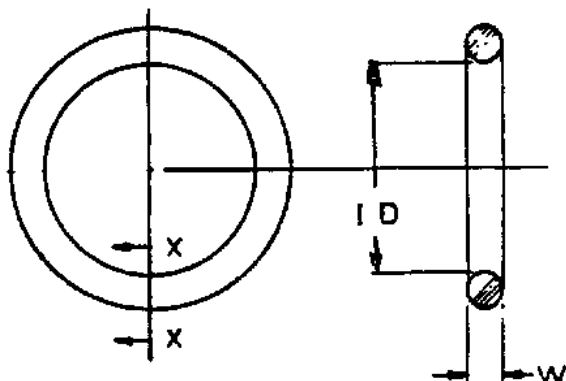
The maximum recommended clearance a 70 Durometer O-Ring can withstand as a function of pressure is located in Table 4.

4.5 SHELF LIFE

Shelf life for nitrile O-ring is four years if stored under proper conditions.

Figure 1

FLASH .003 IN. HIGH
BY .005 IN. THICK MAX.
PERMISSIBLE



ENLARGED SECTION X-X

 NEW HOLLAND	NAME				PART NUMBER	
	STD ORING NBR70 DURO				86529141	
ENGINEERING SPECIFICATION		REV. R	FRAME 2	OF 11	Document Sharing Hub	

Table 1

MATERIAL	ASTM Specimen	Actual Part
Original Physical Properties	—	—
Hardness Points	70 ± 5	—
Tensile strength, min., psi	1500	1200
Ultimate elongation, min., %	200	150
Ultimate elongation, max., %	400	400
Modulus at 100 elongation, min., psi.	450	400
Heat Aging, 70 hr at 257°F	—	—
Hardness, points change	+10	—
Tensile strength, max., % change	-15	-15
Elongation, max., % change	-50	-50
Compression Set, 70 hr at 257°F	—	—
ASTM specimen, max., %	35	—
0.200 to 0.300 in, max., %	—	45
0.100 to 0.200 in., max., %	—	65
Fluid Aging, 70 hr at 302°F	—	—
Type of ASTM Fluid	No. 1 Oil	No. 1 Oil
Hardness, points change	-5 to +8	—
Tensile strength, max., % change	-15	-15
Elongation, max., % change	-40	-40
Volume change, max., %	± 5	± 5
Dry-out volume change, max., % (4 hr at 158° F)	—	—
Fluid Aging, 70 hr at 302°F	—	—
Type of ASTM Fluid	No. 3 Oil	No. 3 Oil
Hardness, points change	0 to -15	—
Tensile strength, max., % change	-30	-30
Elongation, max., % change	-40	-40
Volume change, max., %	+20	+20
Dry-out volume change, max., % (4hr at 158°)	—	—
Low Temperature Aging	—	—
Brittleness at -20°F	No Cracks	—
Figure 8 bend, 5hr at -40°F	—	No Cracks

NOTE: The "Actual Part" limits in this table apply to parts 0.100 inches in cross-section and larger. If smaller cross-section parts are tested, special limits shall be agreed upon between the purchaser and supplier.

 NEW HOLLAND	NAME				PART NUMBER	
	STD ORING NBR70 DURO				86529141	
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Table 2: Standard Size Groups

Size Number	X-Sec Dia (W), In.	Table	Page(s)
-004 to -045	.070 ± .003	5	5
-110 to -163	.103 ± .003	6	6 & 7
-210 to -281	.139 ± .004	7	8 & 9
-325 to -349	.210 ± .005	8	10
-425 to -460	.275 ± .006	9	11

Table 3: Concentricity Requirements
(Values are to be within total indicator reading)

O-Ring Size Number	Piston Groove Diameter to Piston OD	Rod Gland Groove Diameter to Rod Bore Diameter
-006 to -045	0.002 in	0.002 in
-110 to -163	0.003 in	0.003 in
-210 to -281	0.004 in	0.004 in
-325 to -349	0.006 in	0.006 in
-425 to -460	0.008 in	0.008 in

Table 4: Maximum Recommended Clearance—70 Durometer

Pressure—Psi	Clearance—Inches
0	0.010
250	0.010
500	0.008
1000	0.005
1500	0.003