

RFID Tag Instructions

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1. Description

This document is in reference to Milwaukee Cylinder RFID tags. Milwaukee Cylinder RFID tags are 13.56 MHz HF inductive coupled technology passive RFID tags designed to work in industrial environments on tie rod cylinders. These tags are shipped factory loaded with identification information related to a specific serial number tie rod cylinder. A description of the information is located in Chart 1 below.



An RFID tag is available for any tie rod model product (H, MH, LH, A, and MN) with the specific RFID tag model based on tie rod diameter. See Model Number Table below.

The Milwaukee Cylinder RFID system is designed to assist cylinder users to quickly and accurately locate information about their cylinder to assist in ordering parts for corrective and preventative maintenance. The tag includes the cylinder's serial number as well as repair kit model information which is used to communicate to Milwaukee Cylinder the cylinder requiring maintenance to ensure the correct parts/kits are ordered.

2. Model Number Table

RFID PART NUMBER CHART

H	BORE SIZE		RFID PART #	TIE ROD DIAMETER	METRIC TIE ROD DIAMETER
	AIR/LH/MN	MH			
1-1/8"	1-1/8"	25mm	RTR80190	#10-32	M5
—	1-1/2"	32mm	RTR80250	1/4"	M6
—	2" & 2-1/2"	40mm	RTR80312	5/16"	M8
1-1/2"	3-1/4" & 4"	50 & 63mm	RTR80375	3/8"	M12
2" & 2-1/2"	5" & 6"	—	RTR80500	1/2"	—
3-1/4" & 4"	8"	80 & 100mm	RTR80625	5/8"	M16
—	10" & 12"	—	RTR80750	3/4"	—
5"	14" & 16"	125mm	RTR80875	7/8"	M22
6"	—	160mm	RTR81000	1"	M27
7"	—	200mm	RTR81125	1-1/8"	M30
8"	—	—	RTR81250	1-1/4"	—
10"	—	—	RTR81750	1-3/4"	—
12"	—	—	RTR82000	2"	—

3. RFID Tag Specifications

Operating temperature: -25° to 70° C (-13° to 158° F)

Caution: Only perform read or write operations while within the Operating Temperature range

Storage temperature: -25° to 130° C (-13° to 266° F)

Note: Memory will safely be retained in this range

Protection per IEC 60529 - IP Rating: 67

Housing material: PPS-GF40

Supported Standard: ISO 15693

Maximum read/write distance: approximately 75mm

Tag is designed for a RFID reader to read across short dimension



Note: RFID tag performance is affected by contamination containing metal. Simply wipe down tag to improve performance

4. Installation/Moving RFID tag

The RFID tag normally comes pre-installed on a tie rod close to the rod end. If needed, it can be moved to a different location to be accessed better by a RFID reader.

Required tool: 1/16 hex wrench

To move tag: Loosen the two set screws. The RFID tag can be slid along the tie rod or totally removed and located to another tie rod on the cylinder. Once located where desired, simply tighten the set screws until firm resistance is felt.



Comment: Locate tag on the cylinder where the tag will be most accessible to an RFID reader.

5. Information Stored on Tag

Each tag includes “Static” information and “Customer Entered” data.

- Static information is cylinder identification information that never changes. Typically this information is used to obtain information to pre-order parts. See Chart 1 below.
 - The information stored here includes: Serial Number, Date of Manufacture, Model Number, Customer Part Number (if provided by customer), Customer Revision Number (if provided by customer), Bore, Stroke, Operating Pressure, Full Repair Kit (Rod/Tube/Piston Seals, Rod End Bearing), Rod Seal Kit (Rod Seal, Rod End Bearing), Tie Rod Nut Torque and/or Retainer Plate Bolt Torque (if applicable), and Supplier’s Name, Website and Phone Number (if provided) and Comments (Factory entered for special information)

- Customer Entered information - Maintenance Log. See Chart 2 Below.
 - The information stored here includes: Machine Number, Location, Comments, and 7 “log” locations to enter date of maintenance and maintenance comments.
 - The Machine Number and Location are meant to be used by the RFID user to enter information regarding where the cylinder is being used for their convenience.
 - Once the 7 “log” locations are used, it is recommended the user writes over the earliest entry to ensure the 7 latest maintenance activities are logged.

Chart 1: Static/Read Only Data

Location Name	Map	Bytes	Description
Serial #	0-19	20	Cylinder's Unique Serial Number
DOM	20-27	8	Date of Manufacture
Model #	30-57	28	Milwaukee Cylinder Part Number
Cust Part #	60-87	28	Customer Defined Part # (if Available)
Cust Rev #	90-91	2	Customer Defined Rev # (if Available)
Bore	100-106	7	Cylinder Bore
Stroke	110-117	8	Cylinder Stroke
Oper press	120-128	9	Design Operating Pressure
FullRepairKit	130-157	28	Full Service Kit (Rod/Tube/Piston Seals, Rod End Bearing)
Rod Seal Kit	160-187	28	Rod Seal Kit (Rod Seal, Rod End Bearing)
Comments	190-339	150	Other Special Notes ***Include the following items if available/applicable*** Tie Rod Nut Torque Spec Retainer Plate Bolt Torque Spec Supplier's Name Supplier's Website Supplier's Phone Number

Chart 2: Customer Entered Data

Location Name	Map	Bytes	Description
Machine #	500-519	20	Optional - Where Used
Location	520-559	40	Optional - Where Used
Comments	560-759	200	For General Comments
1 Date	760-767	8	Date of First Maintenance
1 Notes	770-869	100	Maintenance performed
2 Date	870-877	8	Date of Second Maintenance
2 Notes	880-979	100	Maintenance performed

3 Date	980-987	8	Date of Third Maintenance
3 Notes	990-1089	100	Maintenance performed
4 Date	1090-1097	8	Date of Fourth Maintenance
4 Notes	1100-1199	100	Maintenance performed
5 Date	1200-1207	8	Date of Fifth Maintenance
5 Notes	1210-1309	100	Maintenance performed
6 Date	1310-1317	8	Date of Sixth Maintenance
6 Notes	1320-1419	100	Maintenance performed
7 Date	1420-1427	8	Date of Seventh Maintenance
7 Notes	1430-1529	100	Maintenance performed

6. Reading the RFID tag

An RFID reader is required to read/write to the RFID tag. Since there are many 3rd party RFID reader manufactures, Milwaukee Cylinder does not offer an RFID reader. Nearly any 13.56 MHz HF RFID supporting ISO 15693 will read the Milwaukee Cylinder RFID tag. Contact the RFID manufacturer for confirmation.

RFID Reader Set-Up: You will have to set up your RFID reader to recognize how Milwaukee Cylinder data is stored on the RFID tag. This information is provided in Chart 1 and Chart 2 above. Consult your RFID reader manufacturer on how to set-up your RFID reader to recognize this information.

7. Balluff RFID Hand Held Reader Solution

Balluff offers a simple to use industrial quality RFID reader solution, utilizing their Hand Held RFID solution (M-871-1-008-X-001-3002)
Contact Balluff for RFID reader information.

Balluff Technical Support: 1-800-543-8390

Milwaukee Cylinder offers special templates designed to be uploaded into the above reader. Contact Balluff for instruction on how to upload these templates into the Balluff Hand Held RFID reader. These templates include:

- MC Tag Info: This contains the static information for the cylinder that does not change (Serial #, Date of Mfg, Bore....) (See Memory Map Section). Typically this information is used to obtain information to pre-order parts.
- MC Maintenance Info: This contains data that the customer can enter onto the tag. This includes the maintenance log. The maintenance log allows up to 7 maintenance activities to be logged onto the tag.



Contact Milwaukee Cylinder for information about how to obtain these templates.

Milwaukee Cylinder Customer Service: 414-769-9700
Sales@milwaukeeecylinder.com

8. Trouble Shooting

The following information is intended to be used only as an aid in determining if a problem exists.

Problem	Possible Cause	Solution
1. Tag Does Not Read	A. The RFID Reader antenna is too far from the tag	A: Move the antenna closer to the tag and attempt to re-read.
	B. Contamination on tag is interfering with reader. <i>Note – metallic contamination can interfere with an RFID tags performance</i>	B: Wipe contaminants off the tag and attempt to re-read
	C. The tag temperature is exceeding its designed read-write temperature of -25° to 70° C (-13° to 158° F)	C: Cool the tag to within the design operating temperature and then attempt to read the tag
	D. RFID Reader	D: Contact the RFID manufacturer
2. Tag Reads, But Data is Missing	A. Tag information was accidentally written over	A: Re-enter data. <ul style="list-style-type: none"> • Regarding “Static” information: All Milwaukee Cylinder products are pin stamped one of the end cap faces. • Regarding “Static” information, ensure the RFID Reader template is set to protect “Static” information from being written over. Contact your RFID Reader manufacturer or RFID Software manufacturer for details.
	B. Tag may have been exposed to temperatures outside its Design Storage temperature: -25° to 130° C (-13° to 266° F)	B: Attempt to Re-enter data.