

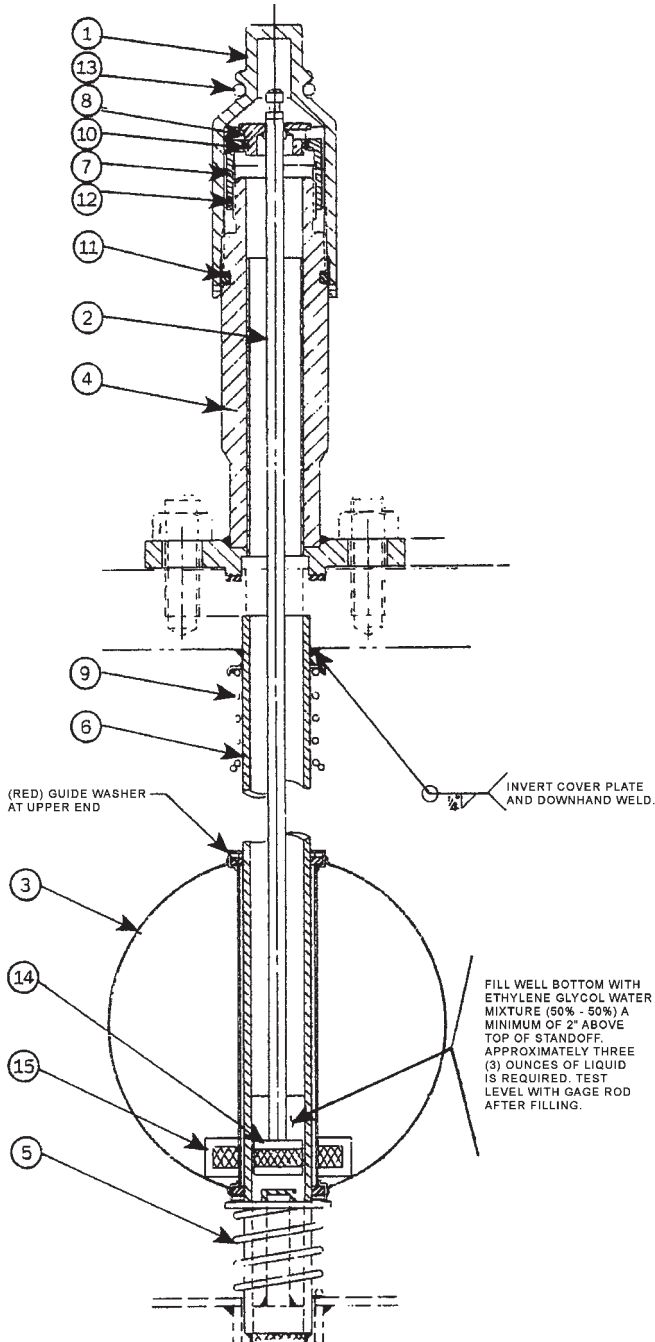


# B-612 Magnetic Gaging Device

Installation  
Instructions



## Installation



1. Leave all the parts of the gaging device in their shipping containers until the parts are to be mounted on the cover plate. The magnets in the float (#15) and on the gage rod (#14) are very powerful and will readily attract metal filings. The outer 1-1/2" stainless steel gage tube (#6) can get nicked or have weld berries attached if it is left uncovered.
2. The hole through the cover plate must be 1-3/16" minimum, and preferably 1-1/4" diameter, in order to permit the gage rod magnet (#14) to enter the gage tube (#6). If the hole through the cover plate is undersized, it must be reamed out. For the typical approved mounting, refer to the AAR Tank Car Regulations, Appendix E, Figure E9.7.
3. The 1-1/2" stainless steel gage tube should be at 90° to the cover plate. All welding must be done by competent welders. Tack the tube in place. Then check the alignment with a square. If the socket is more than 1.53" diameter, be sure the gage tube is centered in the socket. A 3/8" fillet, using a stainless rod such as AWS E-309 or equal, is recommended. **The weld must not be undercut.** If the gage tube is threaded up into a tapped hole in the cover plate, be sure it is tightened, but do not permit the pipe wrench to leave deep jaw marks on the tube. Then a seal weld is recommended.
4. The float (#3) must be prevented from touching the inside top-of-the tank, impacting on the underside of the cover plate, or rubbing up against other braces or structural members. A minimum of a 1/2" clearance around the ball is required. This would mean a 4-1/4" radius from the center line of the gaging device for a 7-1/2" diameter float. On some applications, there will be a top spring (#9) positioned on the gage tube by Midland. On other applications, the company installing the gaging device in the car will have to position the top spring. For these installations, it should be kept in mind that the spring has a solid height of 1". Placement of the spring in its fully compressed position should prevent the float from impacting against any solid metallic tank member. We recommend a 1/2" additional clearance in the positioning of the top spring as a precaution against any installation mistakes. Verify

## Installation (cont.)

with the customer that when the float touches the top spring, sufficient gaging is available to permit the loader to gage to the desired outage for any possible filling density.

5. There should be a brace at the bottom of the gage tube, and one at the top, particularly if the gage tube is threaded into the underside of the cover plate. Proper bracing is critical to the operation of the unit. Braces should be carefully prepared so that the gage tube and the two education lines are tied together without forcing the lines out of their normal positions.
6. Before the bottom brace or guide is welded in place, the float must be put on the gage tube. Up to that time the float should be left in its cardboard shipping box, or in a bag, to insure that no metal filings are attracted by the magnet. Built into the float ends are guide washers, one is red, the other white. The float must be installed on the gage tube with the red washer end facing toward the cover plate, and the white washer end facing toward the bottom of the tank. Move the float up on the gage tube at least two feet away from the welded area when the bottom brace is being installed. The float should be protected so that no weld berries can attach to it or damage it. When attaching the brace, it is recommended that a stainless rod, AWS E-309, or equal, be used. The fillet should be a 1/8" all around. **Undercutting the welds must be avoided.**
7. After all welding is done, the welder should run his hand up and down on the gage tube the full length where the float is to travel, to make sure there are no weld berries clinging to the tube. Any nicks, gouges, weld berries, etc., should be removed and the indentations blended out with a fine or smooth cut hand file.
8. As a final check, the float should be moved up and down on the gage tube to be sure that it is free to travel the maximum distance without coming in contact with any structural elements.
9. At this time, the inner gage rod (#2) should be removed from its cardboard shipping container. Examine the magnet (#14) at the end of the rod to

be sure there are no metal filings clinging to it. Then insert it through the cover plate into the gage tube.

10. Remove the protective cover (#1) from the gaging device body assembly (#4). Carefully fit the body assembly over the inner gage rod and bolt it in place. The gage rod should not extend more than two inches above a white nylon sleeve (#8). If it does, please contact the supervising engineer or Midland Manufacturing for directions.
11. Measure the distance from the inside top of the tank to the top of the cover plate. If the cover plate is not in place, measure to the top of the nozzle flange and add 2" for the thickness of the standard 18" manway cover plate. This dimension should correspond to 'A' on the installation drawing. If it does not equal the 'A' dimension, notify the engineer in charge of the project for instructions. If it does, then tack weld the 2-1/8" diameter by 1-1/2" long steel installation correction nut (#7) in place.



**CAUTION:** Weld only in a well-ventilated area.

Item 7 is zinc-plated and may give off toxic gases when heated.

The normal distance from the bottom of P/N 7 to the shoulder on P/N 4 is 1/2". If it has to be moved less than 1/2", loosen the set screw (#12), change its height, tighten the set screw, and tack weld it in place so that it cannot move. If it has to be moved more than 1/2" ask the supervising engineer to contact Midland.

12. After the gaging device is in place, it must be checked for leaks. The gaging device body (#4) has 2" NPT thread on it. Attach a coupling to the body, then introduce dry air into the unit. Then put soap suds (or check with a sniffer or a mass spectrometer) on all the joints. Places to check are the body mounting to the cover plate, where the tube recesses into the underside of the cover plate, and where the plug closes off the bottom of the gage tube. If there are any leaks detected, report this to the supervising engineer.
13. Install the protective cover (#1) back on top of the gaging device body assembly. There should be

## Installation (cont.)

at least 2" clearance between these parts when the cover is being removed.

14. Included in the shipping crate is a tan envelope containing instruction placards. There should be a placard installed on each application, either on the inside top of the protective housing cover, or the inside of the dome housing where it can easily be read. Clean off the mounting surface in accordance with your company procedure, then peel back the protective paper that covers the adhesive backing. Apply the placard and smooth it down so that all edges are bonded to the metal. If this area is to be repainted, mask the instruction placard.
15. If the manway cover assembly, with all the piping, gaging device and other fittings, is placed on the ground, be sure that the gaging device is not on the underside of the assembly. The float cannot support the weight of this assembly and the magnets will attract filings.
16. When the manway cover assembly is lowered into the tank, take great care to make sure that the float does not hit the side of the manway nozzle as it is going into the tank. It should be guided very carefully because the outermost part of the float extends more than 9" from the center of the cover plate, and a normal vertical drop installation will result in the float hitting the manway nozzle.

## NOTICES AND WARRANTY

### REGULATIONS

Midland gaging devices are used in a variety of products, many of which are hazardous materials. The acceptance and transportation of the products are regulated by the DOT in the U.S.A., and in Canada by Transport Canada, as well as other governmental bodies, particularly when used in stationary applications. All personnel should be familiar with and follow these regulations. Nothing in this pamphlet is intended to conflict with or supersede these regulations. The information contained herein is thought to be reliable. It was gathered from knowledgeable sources, but Midland Manufacturing Corp. makes no representations or guarantees about its accuracy or completeness and assumes no liability for this information.

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### Obtaining Product Drawings

Assembly drawings of Midland gaging devices are available at no charge, and will be mailed upon request. Address any questions concerning valve maintenance or usage to the Engineering Dept., Midland Manufacturing Corp.

### Warranty

Midland warrants the products of its own manufacture to be free of defects in material and workmanship for a period of one (1) year from the date of invoice. Furnished materials and accessories purchased from other manufacturers are warranted only by and to the extent of those manufacturers' warranties, if any.

MIDLAND MAKES NO WARRANTY OF ANY KIND WHATSOEVER, EXPRESS OR IMPLIED, OTHER THAN AS SPECIFICALLY STATED HERE. MIDLAND MAKES NO WARRANTIES OF MERCHANTABILITY OR FITNESS FOR ANY PARTICULAR PURPOSE OR USE. Midland's obligation under this warranty is strictly limited, at its option, to 1) repair or replacement at its factory of a like quantity of product; 2) refunding to purchaser money paid to Midland for its product; or 3) issuance of written authorization for the Purchaser to repair or replace, at costs comparable to Midland's normal manufacturing costs those parts proven defective, provided that Purchaser has given to Midland immediate notice upon discovery of such defect. Merchandise claimed to be defective shall not be returned without first obtaining Midland's written consent. The undertaking of repair or replacement by the Purchaser, or its agents, without Midland's written consent, shall void Midland's warranty and relieve Midland of all responsibility. Under no circumstances shall Midland be liable for any direct, incidental, consequential or other damages of any kind in connection with the installation, operation, maintenance, repair, inspection or other use of any product purchased from it.



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