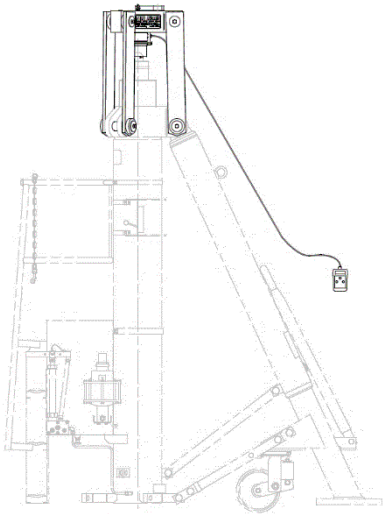
OPERATION & SERVICE MANUAL



Model: 8429E
150 T Jack Test Fixture
S/N 146 and Up

01/2019 – Rev. 01

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REVISION	DATE	TEXT AFFECTED
01	01/2019	Original release

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This product can not be modified without the written approval of Tronair, Inc. Any modifications done without written approval voids all warranties and releases Tronair, Inc., it suppliers, distributors, employees, or financial institutions from any liability from consequences that may occur. Only Tronair OEM replacement parts shall be used.

CAUTION!

Aircraft manufacturer's specifications and instructions must be followed. In the event of contradiction between aircraft manufacturer's specifications and Malabar's, aircraft manufacturer's will prevail.

1.0 PRODUCT INFORMATION

1.1 DESCRIPTION

The Malabar 150 ton Test Fixture Model 8429E is designed to test Malabar Tripod Jack Models 703, 711, 712B, 713A, 714A, 714D, 717A, 718A, 718B, 725A, 731, 733, 736A, 737, 743, 746, 748A, 749, 749S, 759A, 760, 761, 763, 767A, 768A, 775, 775S, 785, 789, 792, 793, 795, 796, 7120A, 7120B, 7120C, 7120D, 7120E, *7210B, *7210R, *7210S, *7210-S1, *****7215, *****7215A, *****7215B, 7225A, **7235A, 8281A, 8487, 8487A, 8551, 8552, 8704, 8713, 8721, 8721A, 8721AEMB, 8722, 8722A, 8730, 8730A, 8730B, 8731, 8756, **8760, 8761, 8769, 8802, 8803, 8803A, 8810, 8810A, 8811, 8811A, 8811B, 8823, 8826, 8841, 8850, 8850EMB, 8857, ***8863, **8864, ****8865, ****8882, **8902, ****8918, *****8923, 8924, 8934, and 8935.

This test fixture is designed to test the above Malabar Tripod Jacks up to their safety pop-off valve settings thus allowing checking of safety pop-off valve settings. This test fixture is also designed to test hydraulic system integrity and verify load gauge accuracy.

*These jacks require separate test bar kit part number 842950 that is not included with Test Fixture Model 8429E.
**These jacks require separate test bar kit part number 842951 that is not included with Test Fixture Model 8429E.
***This jack requires separate test bar kit part number 842952 that is not included with Test Fixture Model 8429E.
****These jacks require separate test bar kit part number 842953 that is not included with Test Fixture Model 8429E.
*****These jacks require separate test bar kit part number 842957 that is not included with Test Fixture Model 8429E. For use on Malabar axle jacks, refer to 8833 universal axle jack test stand manual.

CAUTION!

The test fixture is not designed for proof testing of tripod jacks.

The test fixture consists of an electronic test fixture head assembly, test adapters, test bars, tripod head test pins, retaining washers, bolts and a permanent storage container. The electronic head assembly consists of:

1. 150 ton capacity load cell (Delta Metrics Part Number 99-3928-0001).
2. Hand-held measuring instrument (Delta Metrics Model E3906) with (SHUNT-CAL REFERENCE READING).
3. 50 foot long cable with built-in 59K ohm shunt-cal resistor. Mating connectors at each end for the load cell and measuring instrument respectively.
4. Four 'AAA' size alkaline batteries.

The unit also comes equipped with two test adapters to accommodate all sizes of Malabar Tripod Jacks. Each time a jack is to be tested, the existing tripod head pins must be removed from the jack and the longer tripod head test pins must be installed. If permanent installation of longer tripod head test pins is desired, tripod head test pin kits containing longer tripod head test pins and associated attachment hardware can be ordered separately under the recommended spare parts section of this manual.

CAUTION!

Assembly and use of this test fixture on any other jacks except those specified herein without express written permission voids any and all liability expressed, written or implied by the Malabar International company.

1.2 MODEL & SERIAL NUMBER

Reference nameplate on unit

1.3 MANUFACTURER

Malabar International
1 Air Cargo Pkwy East
Swanton, Ohio 43558 USA

Telephone: (419) 866-6301 or 800-426-6301
E-mail: sales@malabar.com
Website: www.malabar.com

1.4 SPECIFICATIONS

Rated Capacity ..... 150 tons (136.1 m. tons)
Battery (for electronic head assembly) ..... Four 'AAA' cells
Approximate Test Fixture Weight (includes storage container) ..... 900 lbs (406 kg)

2.0 SAFETY INFORMATION

2.1 USAGE AND SAFETY INFORMATION

To insure safe operations please read the following statements and understand their meaning. Also refer to your equipment manufacturer's manual for other important safety information. This manual contains safety precautions which are explained below. Please read carefully.

WARNING!
Warning is used to indicate the presence of a hazard that can cause ***severe personal injury, death, and/or substantial property damage*** if the Warning Notice is ignored.

CAUTION!
Caution is used to indicate the presence of a hazard, which will or can cause ***minor personal injury or property damage*** is the Caution Notice is ignored.

3.0 PREPARATION PRIOR TO FIRST USE

Prior to each use of the Model 8429E Test Fixture, the electronic load measuring system must be properly set up and calibrated.
Remove parts required for retaining cylinder assembly during jack shipment (see figure 1C).

1. Remove back panel from hand-held measuring instrument.
2. Lift panel out by pressing down on the top portion of battery cover.
3. Install the four 'AAA' size batteries in the battery holder, matching polarities to those indicated on the holder. (Note: Instrument switches off automatically after 10-15min without use).
4. Replace panel. (Note: Steps a. thru d. only required on first use).
5. Connect load cell to measuring instrument using furnished cable with mating connectors.
6. Press the P/ON button to turn the measuring instrument ON and allow digital meter to stabilize for approximately 30 seconds.
7. Make sure that no load is applied to the load cell.
8. With no load on the load cell the digital meter should read 000.00. If not, use a small screwdriver to turn the ZERO potentiometer screw on side of measuring instrument (CW to increase reading and CCW to decrease reading).
9. Press CAL button. The meter should read the value listed on page 1. If not, adjust reading by using small screwdriver to adjust the SPAN potentiometer screw on the side of the measuring instrument to obtain desired reading.
10. Release CAL button. The meter should read 000.00. If not, repeat steps 8 & 9 until zero and shunt-cal readings are achieved. The system is now ready to take test fixture load measurements

4.0 TRAINING

4.1 TRAINING REQUIREMENTS

The employer of the operator is responsible for providing a training program sufficient for the safe operation of the unit.

4.2 TRAINING PROGRAM

The employer provided operator training program should cover safety procedures concerning use of the unit in and around the intended aircraft at the intended aircraft servicing location.

4.3 OPERATOR TRAINING

The operator training should provide the required training for safe operation of the unit.

NOTE: Maintenance and Trouble Shooting are to be performed by a skilled and trained technician.

5.0 OPERATION

5.1 PRE OPERATION INSPECTION OF TEST FIXTURE

Each time the test fixture is to be used, inspect the following:

1. Check that there is no loose or missing hardware.
2. Check for any material deformation.
3. Check for obvious weld cracks.
4. Check for excessive corrosion.

CAUTION!

If any of the above conditions cannot be immediately corrected, the test fixture should be tagged with an "out-of-service" tag and corrective action taken prior to further use and/or testing.

5.2 PRE OPERATION INSPECTION OF TRIPOD JACK

Each time a tripod jack is to be tested, visually inspect the following critical areas:

1. Check structural hardware.
2. Check jack braces and condition.
3. Check for any material deformation.
4. Check for obvious weld cracks.
5. Check for excessive corrosion.
6. Check external fluid lines and hoses.
7. Check for excessive fluid leakage.
8. Check for positive stop on screw extension.
9. Check locknut(s) for proper installation.
10. Ensure jack capacity is clearly indicated.
11. Check tripod head test pins are properly installed.
12. Check condition of integral ladder and rails (if so equipped).
13. Ensure air relief valve is properly installed to protect air operated pump (if so equipped).

CAUTION!

If any of the above conditions cannot be immediately corrected, the jack should be tagged with an "out-of-service" tag and corrective action taken prior to further use and/or testing.

Each time a tripod jack is to be tested, visually inspect the following non-critical areas:

1. Check paint condition.
2. Check surface condition of plated parts.
3. Check caster condition including adequate foot pad floor clearance.
4. Check tow handle condition (if so equipped).
5. Check load gauge condition (if so equipped).
6. Check jack leveling equipment (if so equipped).
7. Check air line lubricator (if so equipped).
8. Check condition of any other accessories or non-critical components.

CAUTION!

If any of the above non-critical conditions exist, recommend corrective action be taken within a reasonable time frame.

5.0 OPERATION *(continued)*

5.3 OPERATING PROCEDURES

1. To install test fixture on tripod jack, perform the following steps for tripod jack models 703, 733, 736A, 749, 749S, 8731, 8761, 8769, 8802, 8803, 8803A, 8810 8810A, and 8823 (see figures 3A & 3B):
   a. Remove three existing tripod head pins from jack tripod head and install three tripod head test pins (figure 3B, item 4).
   b. Temporarily retain tripod head test pins in place using attaching washers and hardware (figure 3B, items 3, 9 & 10).
   c. Install test adapter (figure 3B, item 1) on test fixture head assembly using three 3/8-16 bolts (figure 3B, item 8).
   d. Install three tripod head test pins (figure 3B, item 5) on test fixture head assembly.
   e. Temporarily retain tripod head test pins in place using attaching washers and hardware (figure 3B, items 3, 9 & 10).
   f. Support test fixture head assembly with a crane or similar lifting device.
   g. Position test fixture head assembly over jack to be tested.
   h. The test bars and bushings must be installed correctly (see figure 3B). Install six test bars (figure 3B, item 2) and bushings (figure 3B, items 6 & 7) one at a time. Only remove the appropriate attaching washers and hardware from the ends of the tripod head test pins needed to install each test bar. Reinstall attaching washers and hardware and tighten before continuing with the installation of the remaining test bars.
2. To install test fixture on tripod jack, perform the following steps for tripod jack models 785, 789, 792, 793, 795, 796, 8756, 8811, 8811A, 8811B, 8841, 8865 and 8918 (see figures 3A & 3C):
   a. Remove three existing tripod head pins from jack tripod head and install three tripod head test pins (figure 3C, item 5). Not required for 8865 and 8918.
   b. Temporarily retain tripod head test pins in place using attaching washers and hardware (figure 3C, items 4, 9 & 10). Not required for 8865 and 8918.
   c. Remove locknut from tripod jack.
   d. Install test adapter (figure 3C, item 1) on test fixture head assembly using three 3/8-16 bolts (figure 3C, item 8).
   e. Install three tripod head test pins (figure 3C, item 6) on test fixture head assembly.
   f. Temporarily retain tripod head test pins in place using attaching washers and hardware (figure 3C, items 4, 9 & 10).
   g. Support test fixture head assembly with a crane or similar lifting device.
   h. Position test fixture head assembly over jack to be tested.
   i. The test bars and bushings must be installed correctly (see figure 3C). Install six test bars (figure 3C, items 2 & 3) and bushings (figure 3C, item 7) one at a time. Only remove the appropriate attaching washers and hardware from the ends of the tripod head test pins needed to install each test bar. Reinstall attaching washers and hardware and tighten before continuing with the installation of the remaining test bars.
3. To install test fixture on tripod jack, perform the following steps for tripod jack models 761, 763, 768A, (see figures 3A & 3D):
   a. a. Remove three existing tripod head pins from jack tripod head and install three tripod head test pins (figure 3D, item 5).
   b. Temporarily retain tripod head test pins in place using attaching washers and hardware (figure 3D, items 4, 9 & 10).
   c. Remove locknut from tripod jack.
   d. Install test adapter (figure 3D, item 1) on test fixture head assembly using three 3/8-16 bolts (figure 3D, item 8).
   e. Install three tripod head test pins (figure 3D, item 6) on test fixture head assembly.
   f. Temporarily retain tripod head test pins in place using attaching washers and hardware (figure 3D, items 4, 9 & 10).
   g. Support test fixture head assembly with a crane or similar lifting device.
   h. Position test fixture head assembly over jack to be tested.
   i. The test bars and bushings must be installed correctly (see figure 3D). Install six test bars (figure 3D, items 2 & 3) and bushings (figure 3C, item 7) one at a time. Only remove the appropriate attaching washers and hardware from the ends of the tripod head test pins needed to install each test bar. Reinstall attaching washers and hardware and tighten before continuing with the installation of the remaining test bars.
4. To install test fixture on tripod jack, perform the following steps for tripod jack models 7235A, 8730, 8730A, 8730B, 8760, 8864, 8882 (see figures 3A & 3D):
   a. Remove three existing tripod head pins from jack tripod head and install three tripod head test pins (figure 3D, item 5).
   b. Temporarily retain tripod head test pins in place using attaching washers and hardware (figure 3D, items 4, 9 & 10).
   c. Install test adapter (figure 3D, item 11) on test fixture head assembly using three 3/8-16 bolts (figure 3D, item 12).
   d. Install three tripod head test pins (figure 3D, item 6) on test fixture head assembly.
   e. Temporarily retain tripod head test pins in place using attaching washers and hardware (figure 3D, items 4, 9 & 10).
   f. Support test fixture head assembly with a crane or similar lifting device.
   g. Position test fixture head assembly over jack to be tested.
   h. The test bars and bushings must be installed correctly (see figure 3D). Install six test bars (figure 3D, items 2 & 3) and bushings (figure 3D, item 7) one at a time. Only remove the appropriate attaching washers and hardware from the ends of the tripod head test pins needed to install each test bar. Reinstall attaching washers and hardware and tighten before continuing with the installation of the remaining test bars.

5.3 OPERATING PROCEDURES *(continued)*

5. To install test fixture on tripod jack, perform the following steps for tripod jack models 746, 748A, 8850, and 8850EMB (see figures 3A & 3E):
   a. Remove three existing tripod head pins from jack tripod head and install three tripod head test pins (figure 3E, item 4).
   b. Temporarily retain tripod head test pins in place using attaching washers and hardware (figure 3E, items 3, 9 & 10).
   c. Install test adapter (figure 3E, item 1) on test fixture head assembly using three 3/8-16 bolts (figure 3E, item 8).
   d. Install three tripod head test pins (figure 3E, item 5) on test fixture head assembly.
   e. Temporarily retain tripod head test pins in place using attaching washers and hardware (figure 3E, items 3, 9 & 10).
   f. Support test fixture head assembly with a crane or similar lifting device.
   g. Position test fixture head assembly over jack to be tested.
   h. The test bars and bushings must be installed correctly (see figure 3E). Install six test bars (figure 3E, item 2) and bushings (figure 3E, items 6 & 7) one at a time. Only remove the appropriate attaching washers and hardware from the ends of the tripod head test pins needed to install each test bar. Reinstall attaching washers and hardware and tighten before continuing with the installation of the remaining test bars.
6. To install test fixture on tripod jack, perform the following steps for tripod jack models 711, 717A, 718A, 718B, 725A, 737, 775, 775S, 7120A, 7120B, 7120C, 7120D, 7120E, 7215, 7215A, 7215B, 7225A, 8281A, 8713, 8721, 8721A, 8721AEMB, 8722, 8722A, 8923, 8924, and 8934 (see figures 3A & 3F):
   a. Remove three existing tripod head pins from jack tripod head and install three tripod head test pins (item 4).
   b. Temporarily retain tripod head test pins in place using attaching washers and hardware (items 9, 11 & 12).
   c. Install test adapter (item 8) on test fixture head assembly using three 3/8-16 bolts (item 10).
   d. Install three tripod head test pins (item 6) on test fixture head assembly.
   e. Temporarily retain tripod head test pins in place using attaching washers and hardware (items 9, 11 & 12).
   f. Support test fixture head assembly with a crane or similar lifting device.
   g. Position test fixture head assembly over jack to be tested.
   h. The test bars and bushings must be installed correctly. Install six test bars (items 1 & 2) and bushings (items 3 & 7) one at a time. Only remove the appropriate attaching washers and hardware from the ends of the tripod head test pins needed to install each test bar. Reinstall attaching washers and hardware and tighten before continuing with the installation of the remaining test bars.
7. To install test fixture on tripod jack, perform the following steps for tripod jack models 712B, 713A, 714A, 714D, 7210B, 7210R, 7210S, 7210-S1, 8487, 8487A, 8552, 8704, and 8857 (see figures 3A & 3G):
   a. Remove three existing tripod head pins from jack tripod head and install three tripod head test pins (item 4).
   b. Temporarily retain tripod head test pins in place using attaching hardware (items 5 & 13).
   c. Install test adapter (item 9) on test fixture head assembly using three 3/8-16 bolts (item 11).
   d. Install three tripod head test pins (item 7) on test fixture head assembly.
   e. Temporarily retain tripod head test pins in place using attaching washers and hardware (items 10, 12 & 13).
   f. Support test fixture head assembly with a crane or similar lifting device.
   g. Position test fixture head assembly over jack to be tested.
   h. The test bars and bushings must be installed correctly. Install six test bars (items 1 & 2) and bushings (items 3 & 8) one at a time. Only remove the appropriate attaching washers and hardware from the ends of the tripod head test pins needed to install each test bar. Reinstall attaching washers and hardware and tighten before continuing with the installation of the remaining test bars.
8. To install test fixture on tripod jack, perform the following steps for tripod jack models 731, 743, 759A, 760, 767A, 8551, 8826, and 8935 (see figures 3A & 3H):
   a. Remove three existing tripod head pins from jack tripod head and install three tripod head test pins (item 2).
   b. Temporarily retain tripod head test pins in place using attaching washers and hardware (items 7, 9 & 10).
   c. Install test adapter (item 6) on test fixture head assembly using three 3/8-16 bolts (item 8).
   d. Install three tripod head test pins (item 5) on test fixture head assembly.
   e. Temporarily retain tripod head test pins in place using attaching washers and hardware (items 7, 9 & 10).
   f. Support test fixture head assembly with a crane or similar lifting device.
9. To install test fixture on tripod jack, perform the following steps for tripod jack models 8863 (see figures 3A & 3J):
   a. Install test adapter (item 1) on test fixture head assembly using three 3/8-16 bolts (item 2).
   b. Install three tripod head test pins (item 3) on test fixture head assembly.
   c. Temporarily retain tripod head test pins in place using attaching washers and hardware (items 4, 5 & 6).
   d. Support test fixture head assembly with a crane or similar lifting device.
   e. Position test fixture head assembly over jack to be tested.
   f. The test bars must be installed correctly. Install six test bars one at a time. Only remove the appropriate attaching washers and hardware from the ends of the tripod head test pins needed to install each test bar. Reinstall attaching washers and hardware and tighten before continuing with the installation of the remaining test bars.

5.3 OPERATING PROCEDURES *(continued)*

10. To install test fixture on tripod jack, perform the following steps for tripod jack model 8902 (see figures 3A & 3J):
    a. Install test adapter (item 7) on test fixture head assembly using three 3/8-16 bolts (item 8).
    b. Install three tripod head test pins (item 3) on test fixture head assembly.
    c. Temporarily retain tripod head test pins in place using attaching washers and hardware (items 4, 5 & 6).
    d. Support test fixture head assembly with a crane or similar lifting device.
    e. Position test fixture head assembly over jack to be tested.
    f. The test bars must be installed correctly. Install six test bars one at a time. Only remove the appropriate attaching washers and hardware from the ends of the tripod head test pins needed to install each test bar. Reinstall attaching washers and hardware and tighten before continuing with the installation of the remaining test bars.
11. On jacks equipped with air pump, connect air supply (90-110 psig) to the air inlet at the air valve. Air relief valve must be properly installed. Do not attempt to remove air relief valve.
12. Operate air valve or hand pump to raise plunger until the ship adapter contacts test adapter. Make sure ship adapter and test adapter are correctly mated. Do not build up any load between jack and test fixture at this time.
13. Remove crane or lifting device.
14. Ensure electronic load measuring system is properly set up, calibrated and reads 000.00.

CAUTION!

Do not proceed with test if the digital readout fails the zero or span adjustment procedure.

15. Electronic load cell readings are displayed on the digital readout of the measuring instrument. The meter indicates load in tons to the nearest .01 ton.
16. The following major tests can be performed with the test fixture:
    a. Hydraulic system integrity check:
    Close jack release valve. Operate jack to rated capacity as indicated on the test fixture gauge and record. Hold load for 10 minutes. Check all lines, fittings, air pump (if so equipped), cylinder components, valve block and hand pump for leakage. Should test reading drop by more than 2% or leaks are found, corrective action must be taken in accordance with procedures outlined in the specific tripod jack owner's manual prior to further use and/or testing.
    b. Safety pop-off valve setting:
    The majority of Malabar tripod jacks are furnished with a single safety pop-off valve which is typically set to bypass hydraulic fluid back to the reservoir at approximately 5-10% above the rated capacity of the jack. Other Malabar tripod jacks are furnished with two safety pop-off valves, a system relief valve which is typically set to bypass hydraulic fluid back to the reservoir at approximately 5-10% above the rated capacity of the jack and a thermal relief valve which is typically set to bypass hydraulic fluid back to the reservoir at approximately 20-25% above the rated capacity of the jack. Check specific tripod jack owner's manual for exact safety pop-off valve settings. To adjust safety pop-off valves, see procedure under the safety pop-off valve setting section of this manual (see sheet 6).
    c. Load gauge accuracy verification:
    Accuracy of the tripod jack load gauge can be quickly verified by comparing readings at five equally spaced intervals over the scale of the instrument with those of the test fixture. This does not constitute formal gauge calibration and is only intended to serve as a quick check.
17. After testing, install locknut on tripod jack (if applicable) and return test fixture and parts to storage container.

5.4 SAFETY POP-OFF VALVE SETTINGS

CAUTION!

Never increase load more than the upper tolerance limit of safety pop-off valve setting.

Perform the following steps:
See figure 2A - for tripod jack models 711, 712B, 713A, 714A, 714D, 717A, 718A, 718B, 725A, 7120A, 7120B, 7120C, 7120D, 7120E, 7210B, 7210R, 7210S, 7210-S1, 7225A, 8281A, 8552, 8721, 8721A, 8721AEMB, 8857, 8924, and 8934

See figure 2B - for tripod jack models 737, 759A, 760, 767A, 7215, 7215A, 7215B, 7235A, 8487, 8487A, 8551, 8704, 8713, 8722, 8722A, 8761, 8826 and 8923

1. If adjustment is required for safety pop-off valve, perform the following procedure:
    a. Close release valve.
    b. Remove plug to expose safety pop-off valve adjustment screw.
    c. Check specific tripod jack owner's manual for exact safety pop-off valve setting.
    d. While operating the hand pump and observing test fixture gauge, adjust safety pop-off valve adjustment screw until the safety pop-off valve by-passes hydraulic fluid back to the reservoir at the recommended tonnage.
    e. Replace plug.
    f. Open release valve to relieve pressure. Close release valve.
    g. Operate hand pump to verify correct setting. If setting does not fall within recommended range, readjust safety pop-off valve until correct setting is obtained.

5.4 SAFETY POP-OFF VALVE SETTINGS *(continued)*

Perform the following steps for tripod jack models 703, 731, 733, 736A, 743, 748A, 749, 749S, 761, 763, 768A, 775, 775S, 785, 789, 792, 793, 795, 796, 8730, 8730A, 8730B, 8731, 8756, 8760, 8769, 8802, 8803, 8803A, 8810, 8810A, 8811, 8811A, 8811B, 8823, 8841, 8850, 8850EMB, 8863, 8864, 8865, 8882, 8902, 8918, and 8935 (see figure 2C):

1. If adjustment is required for thermal relief valve, perform the following procedure:
   a. Close release valve.
   b. Remove plug to expose thermal relief valve adjustment screw.
   c. Check specific tripod jack owner's manual for exact thermal relief valve setting.
   d. While operating the hand pump and observing test fixture gauge, adjust thermal relief valve adjustment screw until the thermal relief valve by-passes hydraulic fluid back to the reservoir at the recommended tonnage.
   e. Replace plug.
   f. Open release valve to relieve pressure. Close release valve.
   g. Operate hand pump to verify correct setting. If setting does not fall within recommended range, readjust thermal relief valve until correct setting is obtained.
2. 2. If adjustment is required for system relief valve, perform the following procedure:
   a. Close release valve.
   b. Remove plug to expose system relief valve adjustment screw.
   c. Check specific tripod jack owner's manual for exact system relief valve setting.
   d. While operating the hand pump and observing test fixture gauge, adjust system relief valve adjustment screw until the system relief valve by-passes hydraulic fluid back to the reservoir at the recommended tonnage.
   e. Replace plug.
   f. Open release valve to relieve pressure. Close release valve.
   g. Operate hand pump to verify correct setting. If setting does not fall within recommended range, readjust system relief valve until correct setting is obtained.

6.0 MAINTENANCE

6.1 SERVICING

Servicing the test fixture consists primarily of the following:

1. When in use, the structure should be periodically examined for loose hardware and signs of weld cracks, permanent deformation or corrosion. Corrective action should be immediately taken.
2. Hand-held measuring instrument batteries should be replaced when low. Four 'AAA' size cells are required.

6.2 REPAIR AND REPLACEMENT

A repair parts kit (P/N 8429EPK) which contains all the parts marked with (♦) is available and recommended to keep on hand at your facility. In the event of failure of the electronic load measurement system it may be necessary to replace either the load cell or the hand-held measuring instrument. When the original load cell is replaced by one with the same Model No., the system must be set up identical to steps 1a thru 1j, except that a new SHUNT-CAL value as specified by the manufacturer's factory certificate of calibration must be used. If a new hand-held measuring instrument is used with the existing load cell, the replacement unit will be properly adjusted and scaled prior to shipment to you so that only the set-up defined in steps 1a thru 1j will be necessary.

CAUTION!

Using a different model load cell or measuring instrument will require significant system calibration changes and is not recommended by Malabar.

6.3 CALIBRATION:

The test fixture load measurement system must be periodically calibrated using standards traceable to NIST or other equivalent National Standard. The interval of calibration is generally based on frequency of usage and compliance with the user's internal quality standards. Electronic load cell is calibrated by comparing against a known load in a laboratory equipped to perform the calibration. In place shunt calibration using a built-in precision resistor is done at every use of the instrument.

6.4 SPECIAL TOOLS:

The following special tools are not supplied with Test Fixture Model 8429E

Part Number	Description	Qty
842950	Test bar kit (for jack models 7210B, 7210R, 7210S, 7210-S1	1
842951	Test bar kit (for tripod jack models 7235A, 8760, 8864, 8902)	1
842952	Test bar kit (for tripod jack model 8863)	1
842953	Test bar kit (for tripod jack models 8865, 8882, 8918)	1
842957	Test bar kit (for tripod jack models 7215, 7215A, 7215B, 8923)	1

7.0 PROVISION OF SPARES

7.1 SOURCE OF SPARE PARTS

Spare parts may be obtained from the manufacturer:

Malabar International
1 Air Cargo Pkwy East
Swanton, Ohio 43558 USA

Telephone: (419) 866-6301 or 800-426-6301
E-mail: sales@malabar.com
Website: www.malabar.com

7.2 RECOMMENDED SPARE PARTS LISTS

The following spare parts are recommended and available upon request. Reference the following page(s) for Replacement Parts and Kits available.

Part Number	Description	Qty
8429EPK	Repair parts kit	1
842945	Tripod head test pin kit (for tripod jack models 703, 733, 736A, 749, 749S, 8731, 8761, 8769, 8802, 8803, 8803A, 8810, 8810A, 8823)	1
842946	Tripod head test pin kit (for tripod jack models 785, 789, 792, 793, 795, 796, 8756, 8811, 8811A, 8811B, 8841, 8865, 8902, 8918)	1
842826	Tripod head test pin kit (for tripod jack models 746, 748A, 761, 763, 768A, 8730, 8730A, 8730B, 8760, 8850, 8850EMB, 8864, 8882)	1
842947	Tripod head test pin kit (for tripod jack models 711, 717A, 718A, 718B, 725A, 737, 775, 775S, 7120A, 7120B, 7120C, 7120D, 7120E, 7215, 7215A, 7215B, 7225A, 8281A, 8713, 8721, 8721A, 8721AEMB, 8722, 8722A, 8923, 8924, 8934)	1
842948	Tripod head test pin kit (for tripod jack models 712B, 713A, 714A, 714D, 7210B, 7210R, 7210S, 7210-S1, 8487, 8487A, 8552, 8704, 8857)	1
842825	Tripod head test pin kit (for tripod jack models 731, 743, 759A, 760, 767A, 7235A, 8551, 8826, 8935)	1

8.0 IN SERVICE SUPPORT

Contact Malabar, Inc. for technical services and information. See Section 1.3 – Manufacturer.

9.0 GUARANTEES/LIMITATION OF LIABILITY

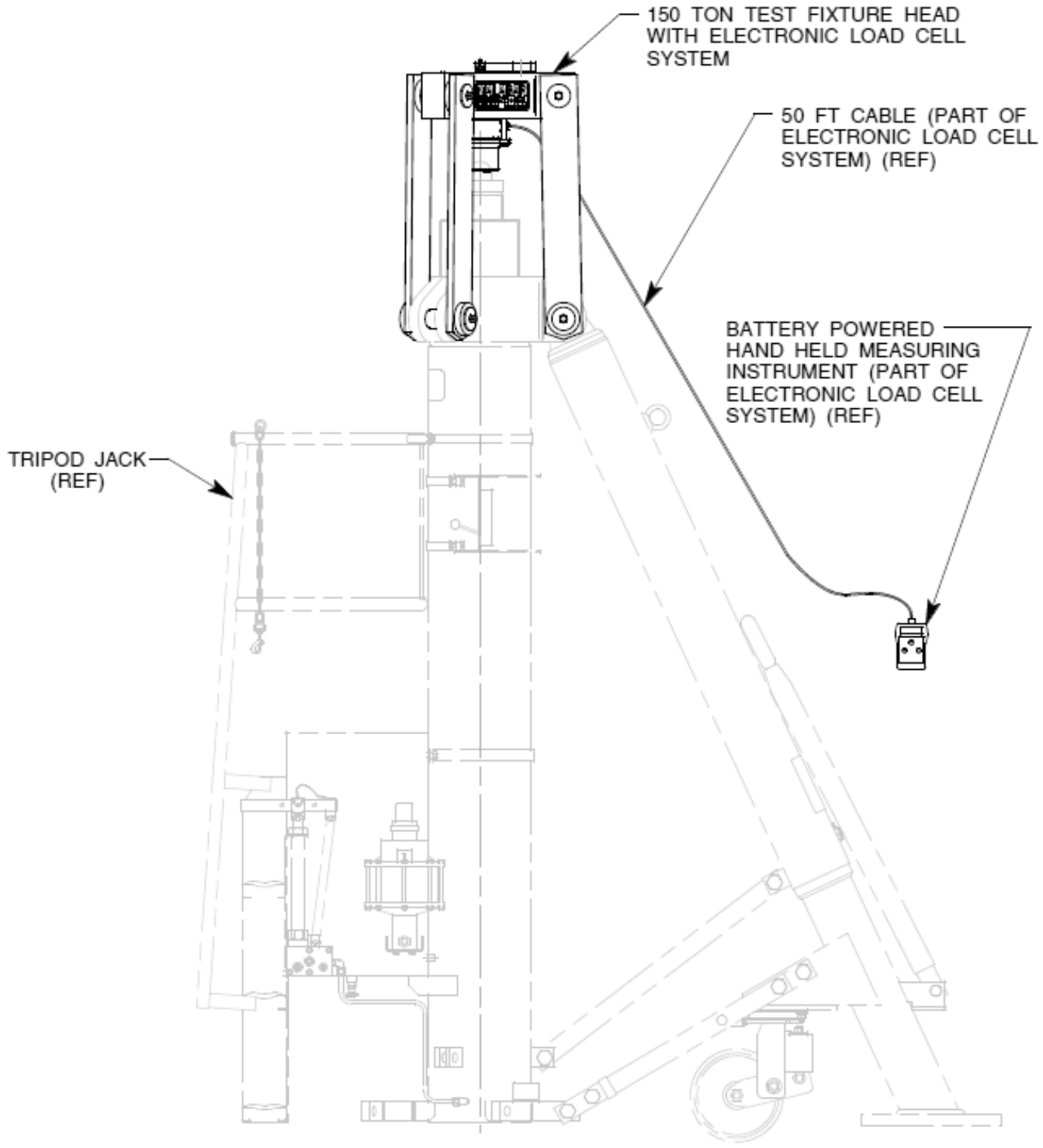
I. Seller warrants each new product of its manufacture to be free from defects in material or workmanship, under proper, reasonable, and normal use and service.

II. The warranty period shall be as follows:
   A. For Malabar equipment, with the exception of Tripod Jacks, the warranty period is one (1) year after date of shipment.
   B. For Malabar Tripod Jacks, the warranty period is three (3) years after date of shipment.

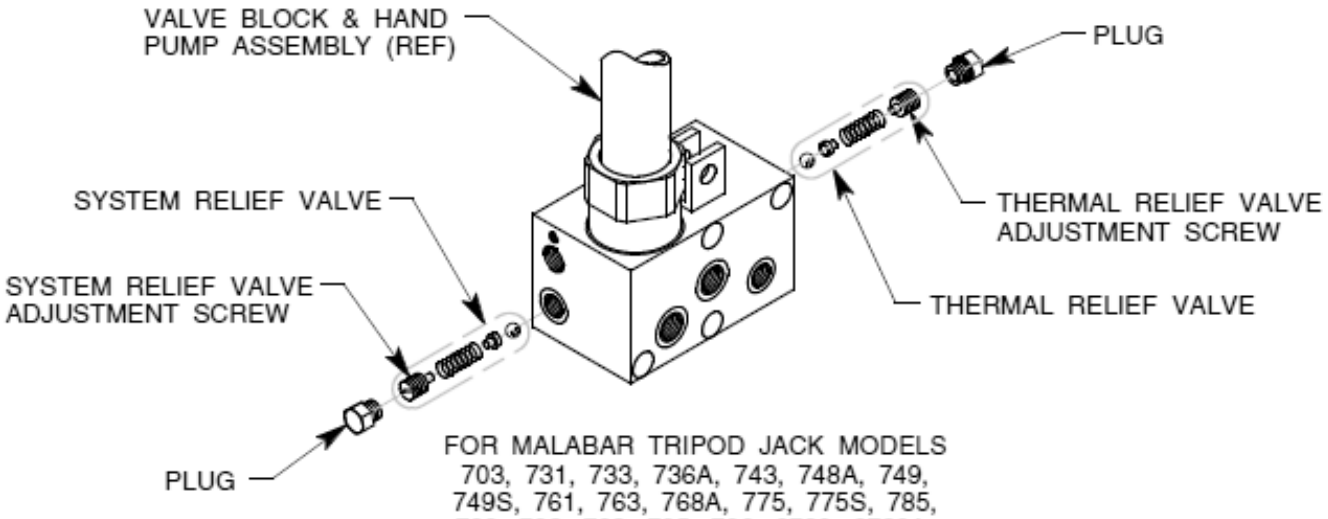
III. Where Buyer claims an alleged defect in material or workmanship and so advises Seller in writing within ten (10) days after discovery thereof, then and in such event, Buyer shall return said equipment, transportation prepaid, to the Seller, provided such return is timely and within the above-mentioned warranty period. This warranty and liability of the Seller is expressly limited solely to replacement or repair of defective parts or goods, and return at Buyer's expense to Buyer after finding by Seller the product was defective prior to original shipment or, at the option of Seller, to providing refund to Buyer of the purchase price for said product.

IV. It is further expressly understood and agreed that:
   A. THERE IS NO WARRANTY, REPRESENTATION OF CONDITION OF ANY KIND, EXPRESS OR IMPLIED, (INCLUDING NO WARRANTY OF MERCHANTABILITY OR OF FITNESS) EXCEPT THAT THE MATERIAL SHALL BE OF THE QUALITY SPECIFIED IN APPLICABLE SPECIFICATIONS, AND NONE SHALL BE IMPLIED BY LAW. Except as otherwise provided herein, quality shall be in accordance with Seller's specifications. Final determination of the material for the use contemplated by Buyer is the sole responsibility of Buyer and Seller shall have no responsibility in connection with such suitability, and
   B. Buyer's sole and exclusive remedy shall be repair or replacement of defective parts or goods by the Seller. Should the goods, in the judgment of Seller, preclude the remedying of the warranted defects by repair or replacement, the Buyer's sole and exclusive remedy shall be the refund of the purchase price, and
   C. Seller shall not be liable for prospective profits or special, indirect or consequential damages, nor shall any recovery of any kind against Seller be greater in amount than the purchase price of the specific material sold and causing the alleged loss, damage or injury. Buyer assumes all risk and liability for loss, damage or injury to persons or property of Buyer or others arising out of use or possession of any product or part sold hereunder, and
   D. Seller shall in no way be deemed or held to be obligated, liable or accountable upon or for any guarantees or warranties, express or implied, or created by statute or by operation of law or otherwise, in any manner of form beyond its express agreement above set forth, and
   E. No warranty herein shall apply to any product which shall have been repaired or altered, unless such alteration or repair has been made by Seller or if, after return to and inspection by Seller, the product is found by Seller to have been subject to misuse, negligence or accident, and
   F. No warranty of any nature is made by Seller as to any component forming a part of the product sold and Buyer shall receive only such warranties offered by such other manufacturer of such component, and
   G. Seller does not assume nor does Seller authorize any other person to assume for it any other liability or make any warranty in connection with the sale of its products.

Typical Tripod Jack/Test Fixture Installation – Figure 1

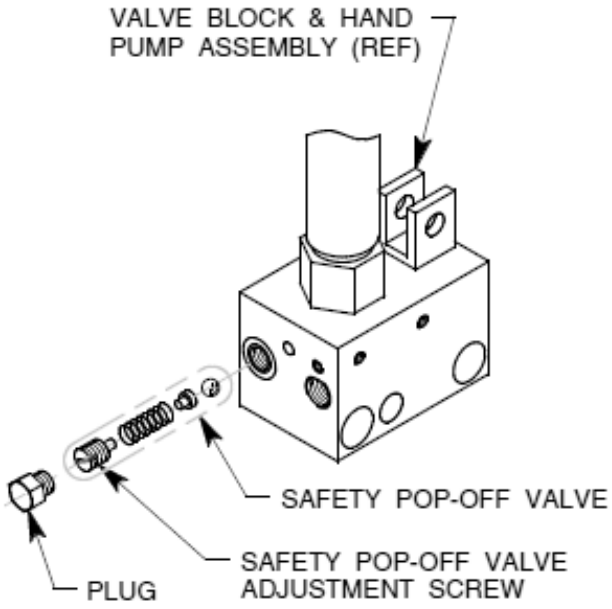


Safety Pop-Off Valves – Figure 2A-C



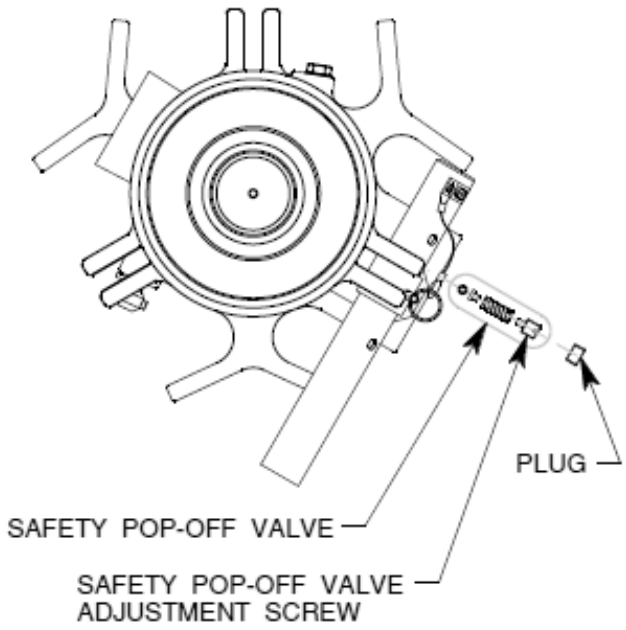
FOR MALABAR TRIPOD JACK MODELS
703, 731, 733, 736A, 743, 748A, 749, 749S, 761, 763, 768A, 775, 775S, 785, 789, 792, 793, 795, 796, 8730, 8730A, 8730B, 8731, 8756, 8760, 8769, 8802, 8803, 8803A, 8810, 8810A, 8811, 8811A, 8811B, 8823, 8841, 8850, 8850EMB, 8863, 8864, 8865, 8882, 8902, 8918, 8935

FIGURE 2C



FOR MALABAR TRIPOD JACK MODELS
737, 759A, 760, 767A, 7215, 7215A, 7215B, 7235A, 8487, 8487A, 8551, 8704, 8713, 8722, 8722A, 8761, 8826, 8923

FIGURE 2B



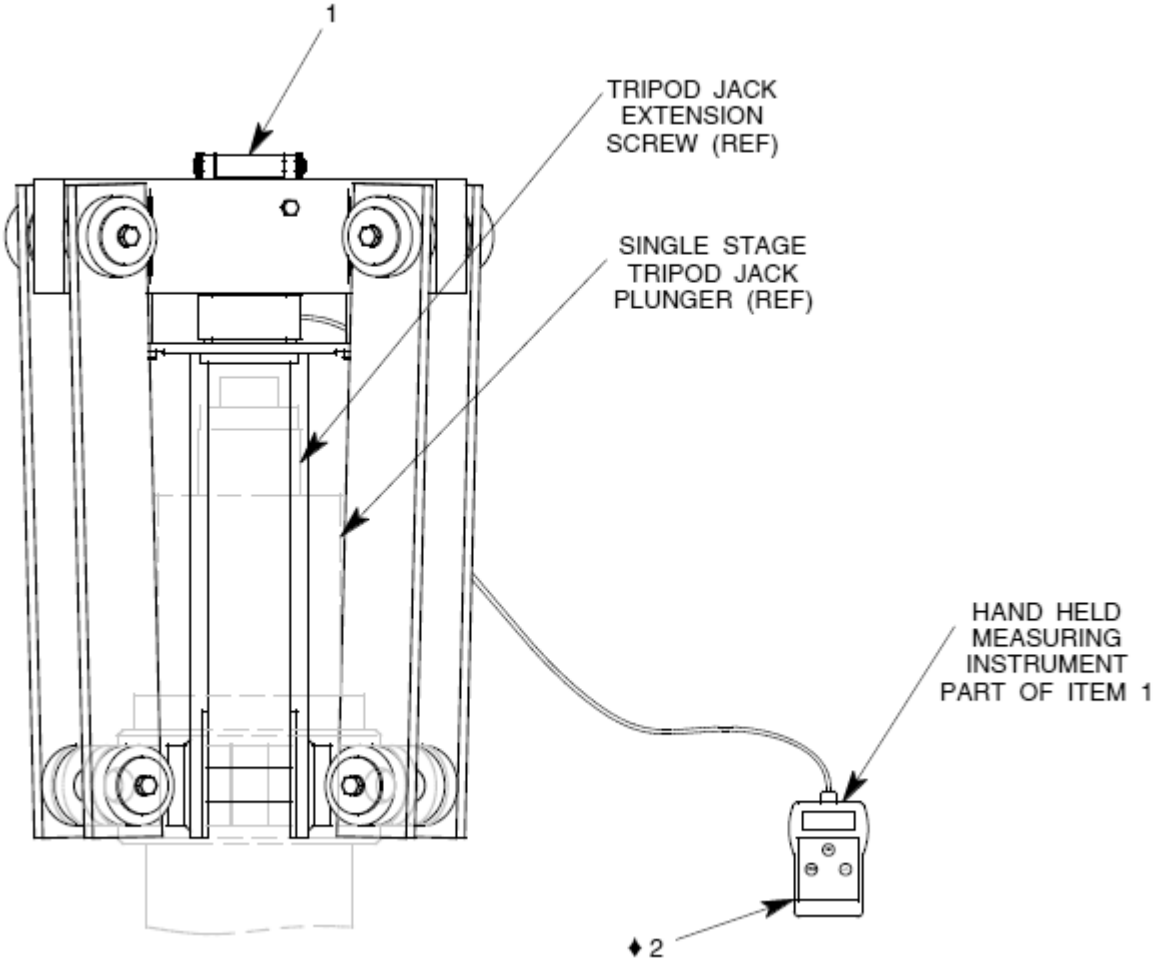
FOR MALABAR TRIPOD JACK MODELS
711, 712B, 713A, 714A, 714D, 717A, 718A, 718B, 725A, 7120A, 7120B, 7120C, 7120D, 7120E, 7210B, 7210R, 7210S, 7210-S1, 7225A, 8281A, 8552, 8721, 8721A, 8721AEMB, 8857, 8924, 8934

FIGURE 2A

Parts List – Figure 3A

When ordering replacement parts/kits, please specify model, serial number and color of your unit.

♦ **PART OF REPAIR PARTS KIT**

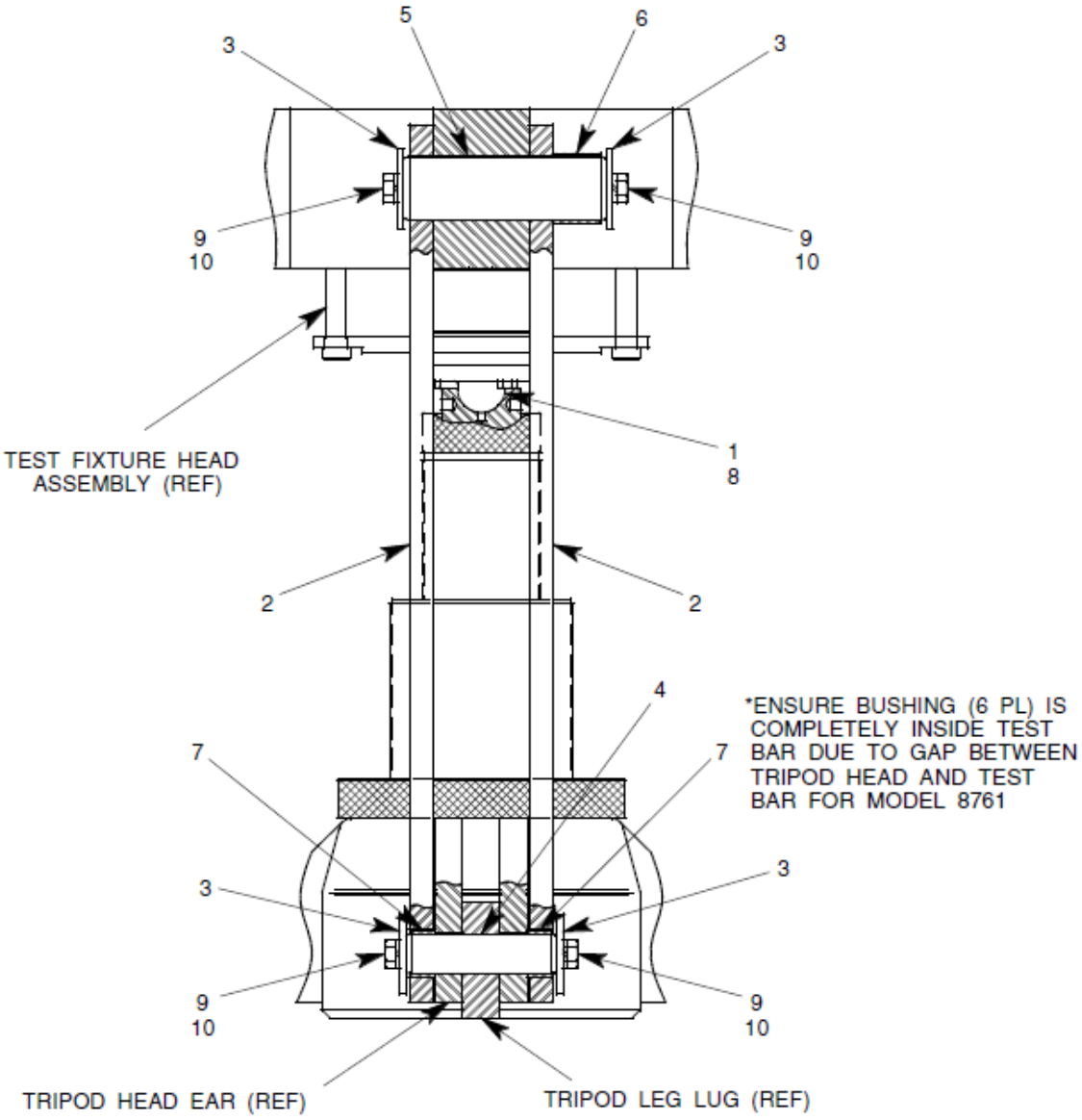


Item	Part Number	Description	Qty
1	849201E	TEST FIXTURE HEAD ASSY	1
2	499-145	BATTERY, 'AAA' CELL ALKALINE	4

See Figures 3B, 3C, 3D, 3E, 3F, 3G, 3H & 3J for various jack test fixture setups

Parts List – Figure 3B

When ordering replacement parts/kits, please specify model, serial number and color of your unit.

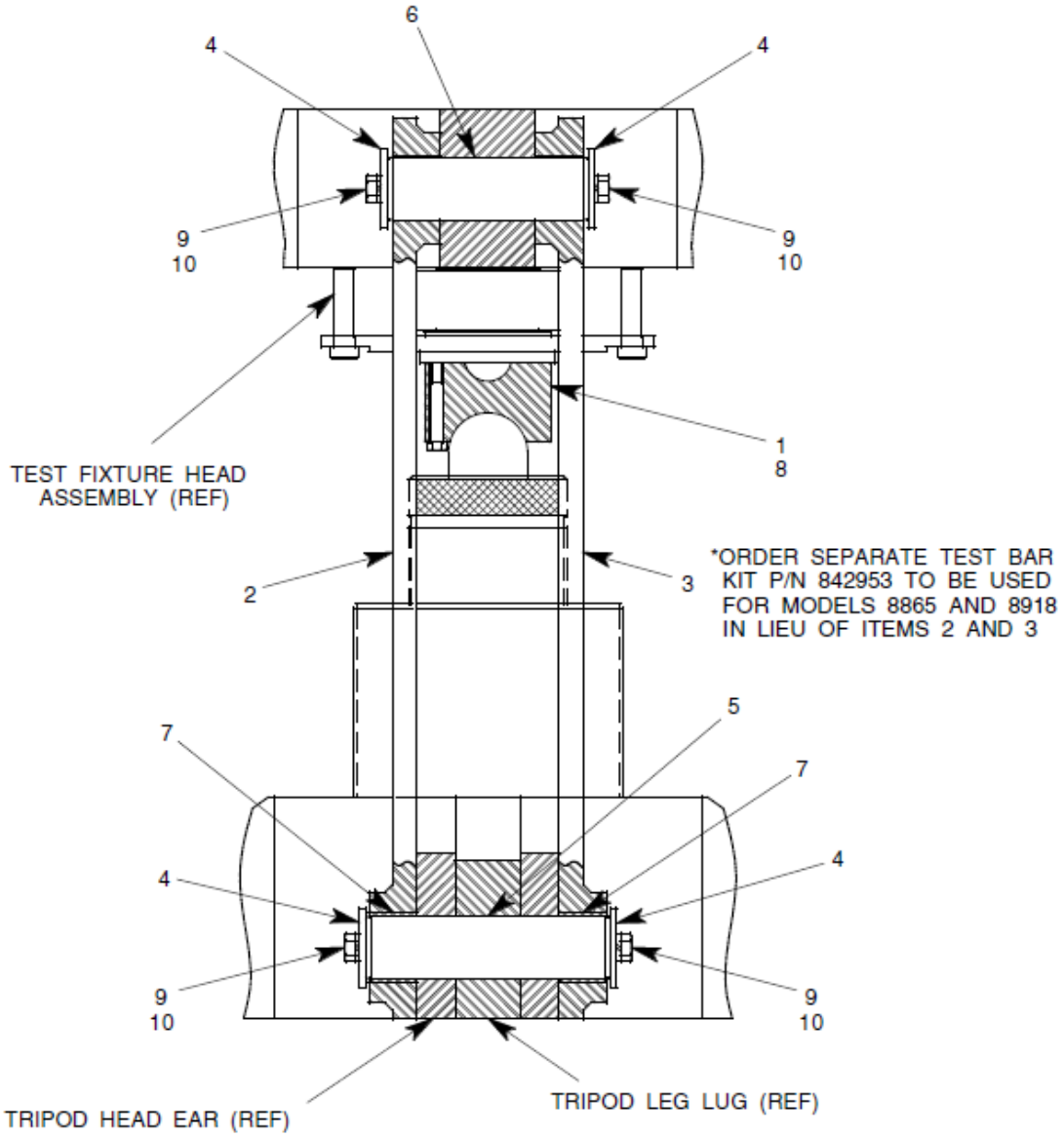


3 PLACES EACH ASSEMBLY FOR MALABAR TRIPOD JACK MODELS:
703, 733, 736A, 749, 749S, 8731, *8761, 8769, 8802, 8803, 8803A, 8810, 8810A, 8823

Item	Part Number	Description	Qty
1	833603	ADAPTER	1
2	842919	TEST BAR	6
3	833607	WASHER	12
4	842923	TRIPOD HEAD TEST PIN	3
5	842920	TRIPOD HEAD TEST PIN	3
6	842924	BUSHING	3
7	842926	BUSHING	6
8	321-011	HHCS, 3/8-16 X 1 LG	3
9	321-051	HHCS, 1/2-13 X 1 LG	12
10	363-004	SPLIT LOCKWASHER, 1/2	12

Parts List – Figure 3C

When ordering replacement parts/kits, please specify model, serial number and color of your unit.

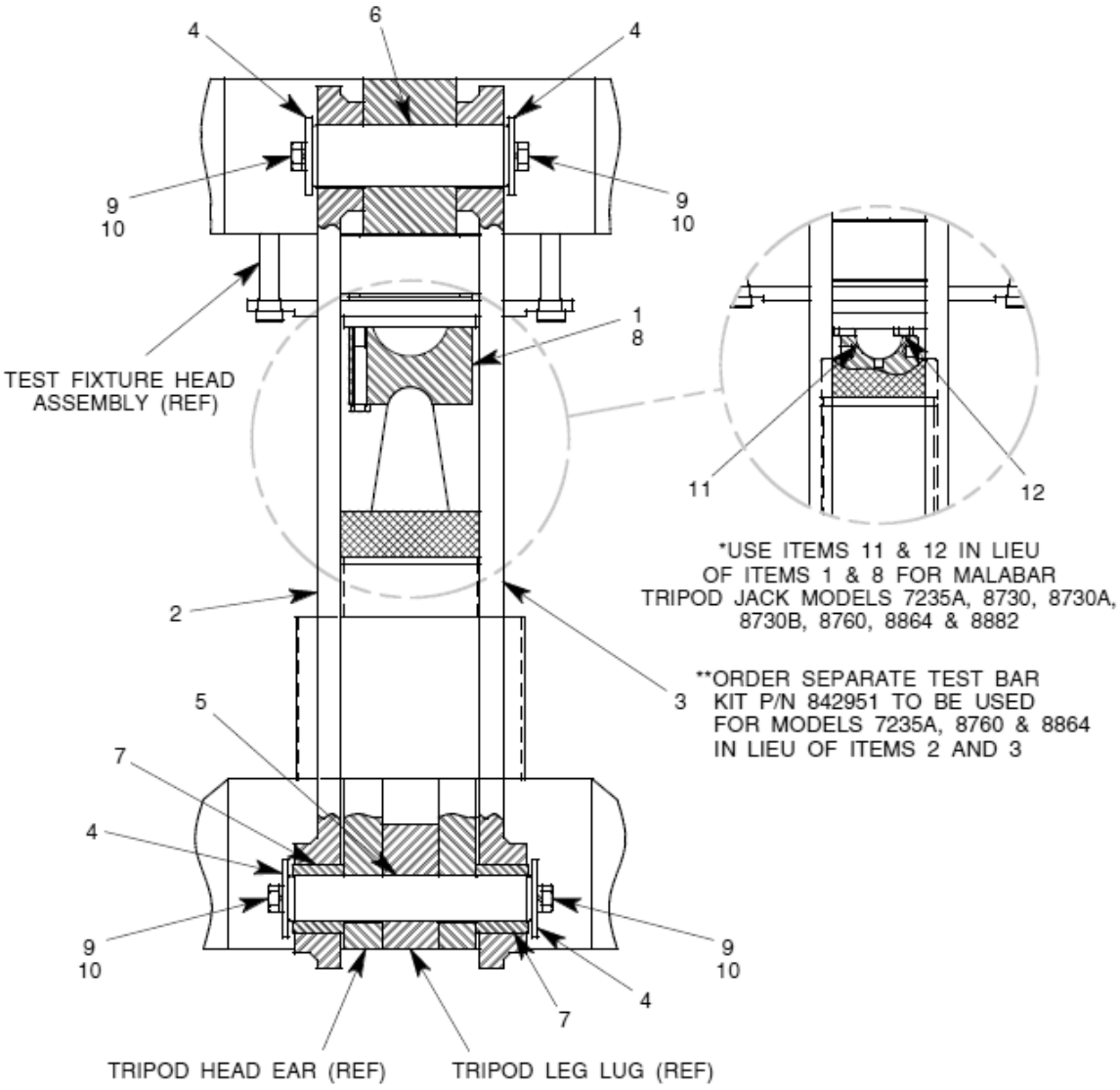


3 PLACES EACH ASSEMBLY FOR MALABAR TRIPOD JACK MODELS:
785, 789, 792, 793, 795, 796, 8756, 8811, 8811A, 8811B, 8841, *8865, *8918
REMOVE LOCKNUT PRIOR TO ASSEMBLY

Item	Part Number	Description	Qty
1	833602	ADAPTER	1
2	842918-1	TEST BAR	3
3	842918-2	TEST BAR	3
4	833607	WASHER	12
5	842921	TRIPOD HEAD TEST PIN	3
6	842920	TRIPOD HEAD TEST PIN	3
7	842924	BUSHING	6
8	321-052	HHCS, 3/8-16 X 3 LG	3
9	321-051	HHCS, 1/2-13 X 1 LG	12
10	363-004	SPLIT LOCKWASHER, 1/2	12

Parts List – Figure 3D

When ordering replacement parts/kits, please specify model, serial number and color of your unit.

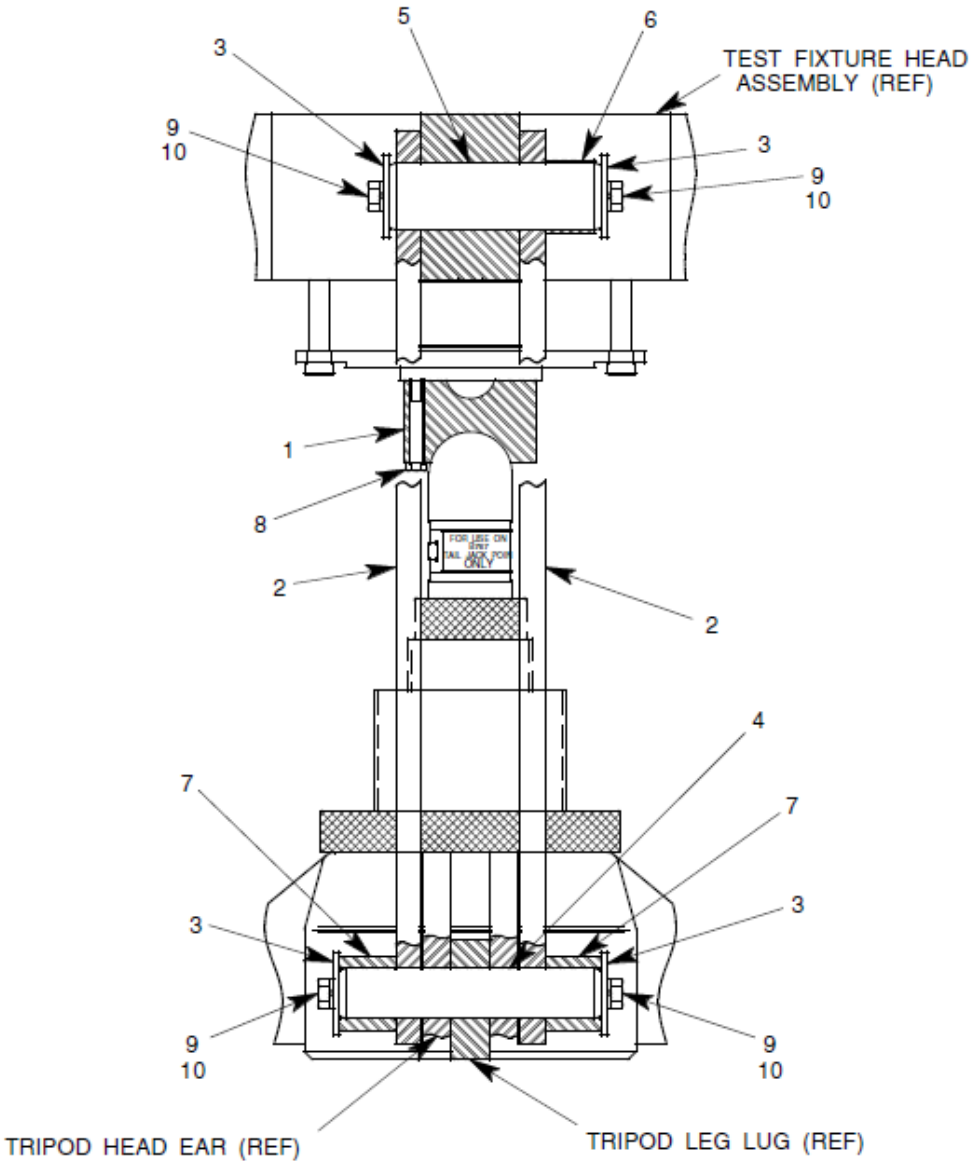


3 PLACES EACH ASSEMBLY FOR MALABAR TRIPOD JACK MODELS:
761, 763, 768A, *&**7235A, *8730, *8730A, *8730B, **8760, **8864, *8882
REMOVE LOCKNUT PRIOR TO ASSEMBLY

Item	Part Number	Description	Qty
1	833602	ADAPTER	1
2	842918-1	TEST BAR	3
3	842918-2	TEST BAR	3
4	833607	WASHER	12
5	842922	TRIPOD HEAD TEST PIN	3
6	842920	TRIPOD HEAD TEST PIN	3
7	842925	BUSHING	6
8	321-052	HHCS, 3/8-16 X 3 LG	3
9	321-051	HHCS, 1/2-13 X 1 LG	12
10	363-004	SPLIT LOCKWASHER, 1/2	12
11	833603	ADAPTER	1
12	321-011	HHCS, 3/8-16 X 1 LG	3

Parts List – Figure 3E

When ordering replacement parts/kits, please specify model, serial number and color of your unit.

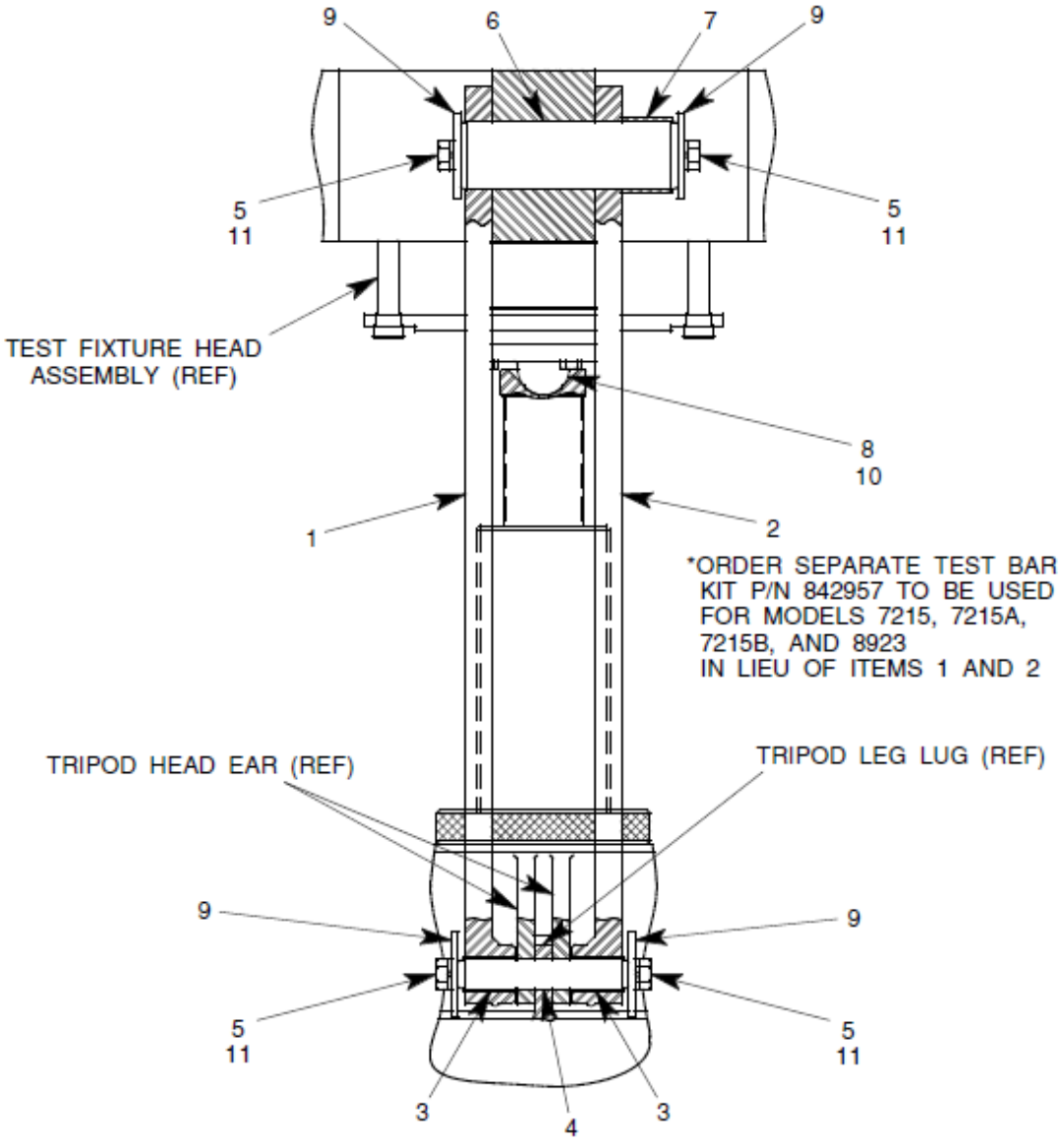


3 PLACES EACH ASSEMBLY FOR MALABAR TRIPOD JACK MODELS:
746, 748A, 8850, 8850EMB

Item	Part Number	Description	Qty
1	833602	ADAPTER	1
2	842919	TEST BAR	6
3	833607	WASHER	12
4	842922	TRIPOD HEAD TEST PIN	3
5	842920	TRIPOD HEAD TEST PIN	3
6	842924	BUSHING	3
7	842925	BUSHING	6
8	321-052	HHCS, 3/8-16 X 3 LG	3
9	321-051	HHCS, 1/2-13 X 1 LG	12
10	363-004	SPLIT LOCKWASHER, 1/2	12

Parts List – Figure 3F

When ordering replacement parts/kits, please specify model, serial number and color of your unit.

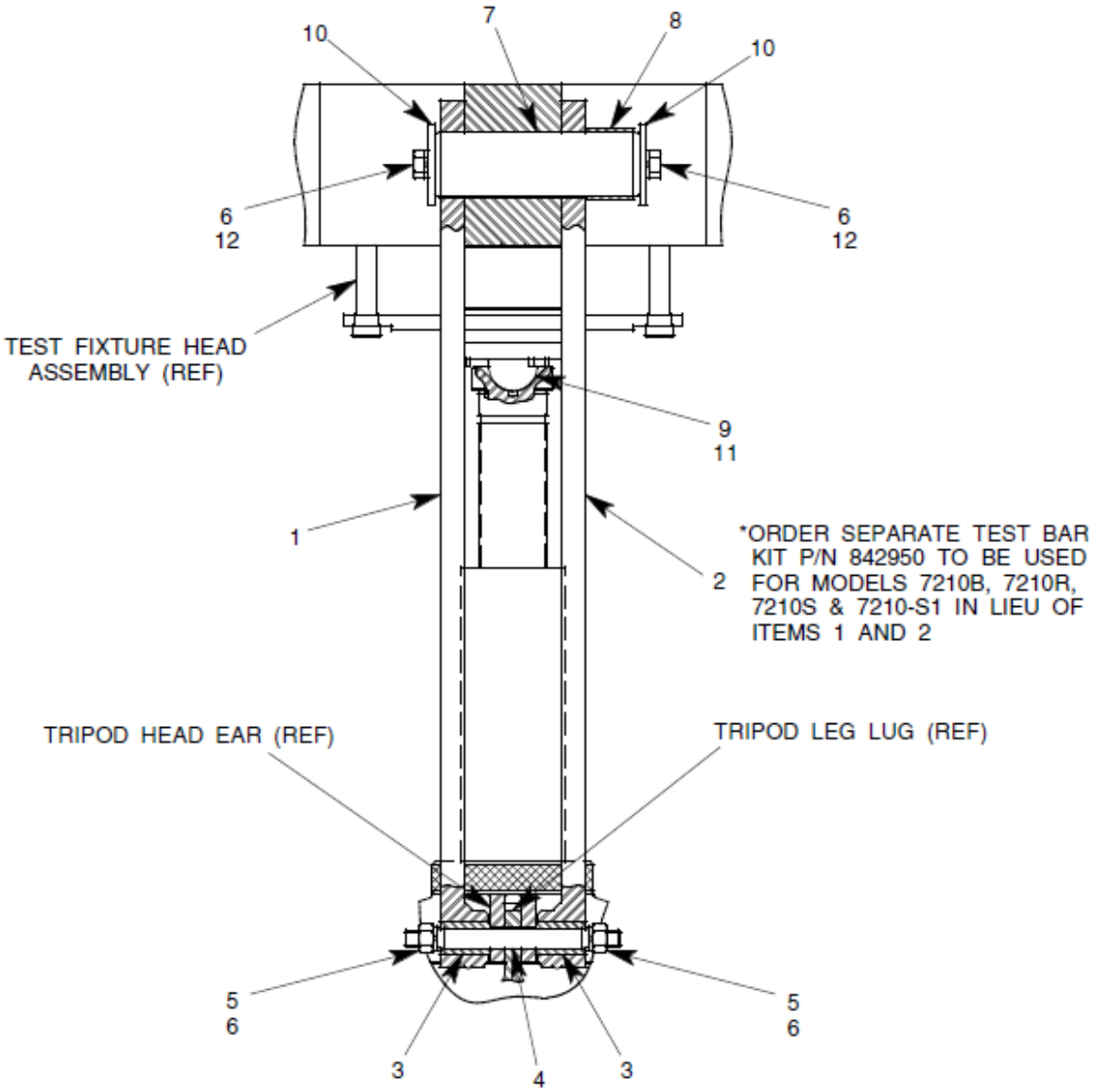


3 PLACES EACH ASSEMBLY FOR MALABAR TRIPOD JACK MODELS:
711, 717A, 718A, 718B, 725A, 737, 775, 775S, 7120A, 7120B, 7120C, 7120D, 7120E, *7215, *7215A, *7215B, 7225A, 8281A, 8713, 8721, 8721A, 8721AEMB, 8722, 8722A, *8923, 8924, 8934

Item	Part Number	Description	Qty
1	842936L	TEST BAR	3
2	842936R	TEST BAR	3
3	842932-1	BUSHING	6
4	842931	TRIPOD HEAD TEST PIN	3
5	363-004	SPLIT LOCKWASHER, 1/2	12
6	842920	TRIPOD HEAD TEST PIN	3
7	842924	BUSHING	3
8	833603	ADAPTER	1
9	833607	WASHER	12
10	321-011	HHCS, 3/8-16 X 1 LG	3
11	321-051	HHCS, 1/2-13 X 1 LG	12

Parts List – Figure 3G

When ordering replacement parts/kits, please specify model, serial number and color of your unit.

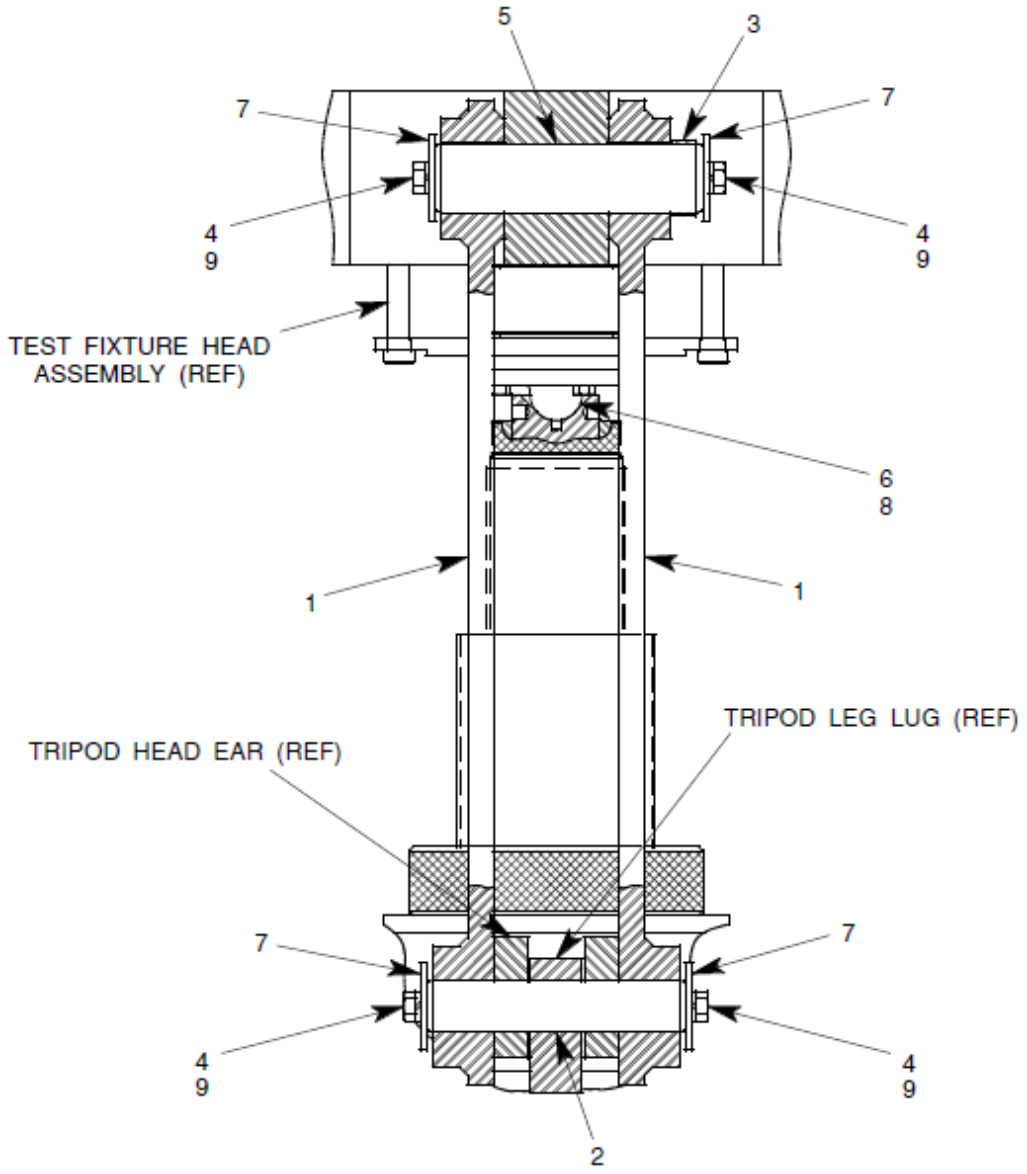


3 PLACES EACH ASSEMBLY FOR MALABAR TRIPOD JACK MODELS:
712B, 713A, 714A, 714D, *7210B, *7210R, *7210S, *7210-S1, 8487, 8487A, 8552, 8704, 8857

Item	Part Number	Description	Qty
1	842936L	TEST BAR	3
2	842936R	TEST BAR	3
3	842932-2	BUSHING	6
4	842934	TRIPOD HEAD TEST PIN	3
5	351-003	HEX NUT, 1/2-13	6
6	363-004	SPLIT LOCKWASHER, 1/2	12
7	842920	TRIPOD HEAD TEST PIN	3
8	842924	BUSHING	3
9	833603	ADAPTER	1
10	833607	WASHER	6
11	321-011	HHCS, 3/8-16 X 1 LG	3
12	321-051	HHCS, 1/2-13 X 1 LG	6

Parts List – Figure 3H

When ordering replacement parts/kits, please specify model, serial number and color of your unit.

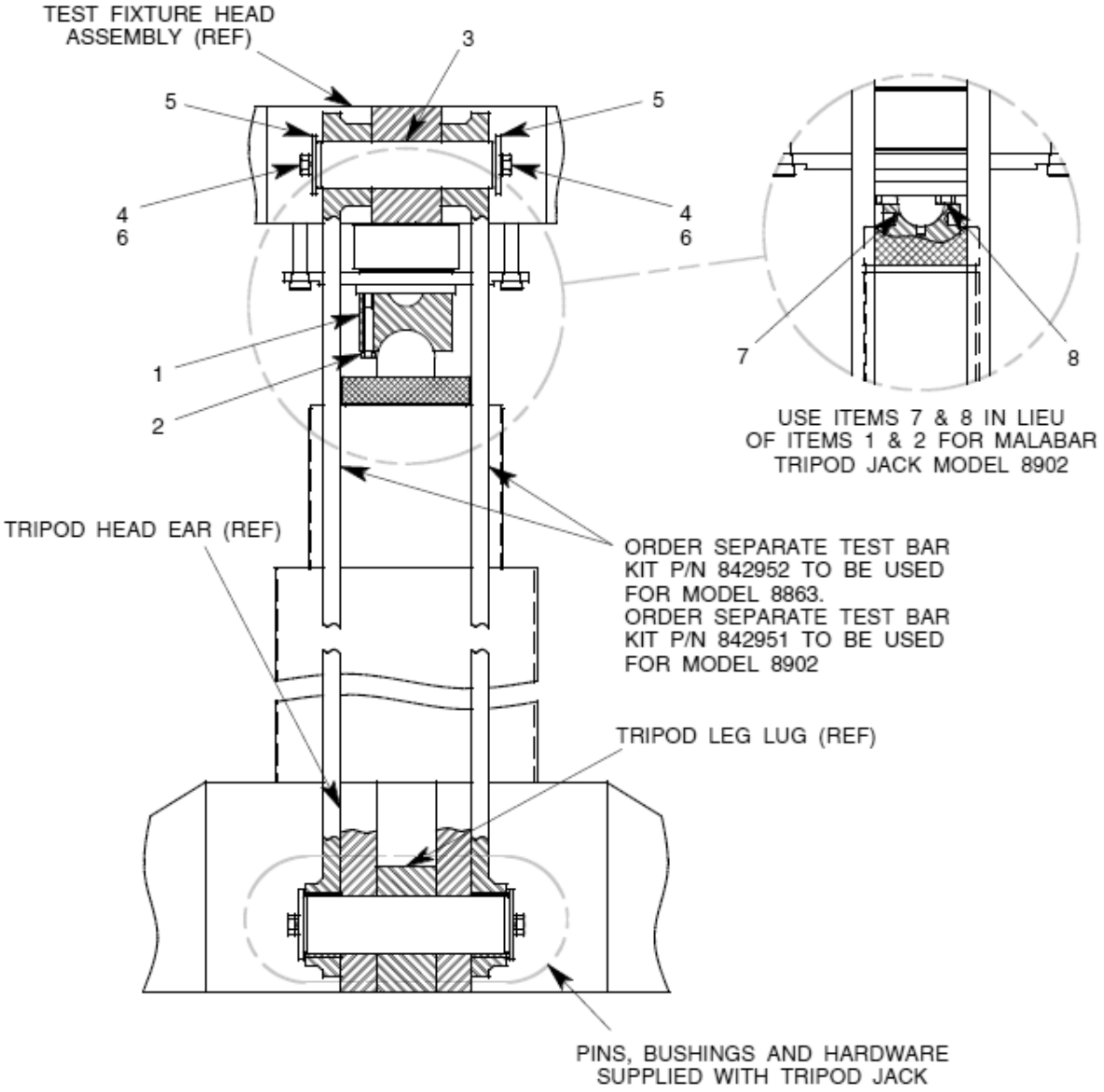


3 PLACES EACH ASSEMBLY FOR MALABAR TRIPOD JACK MODELS:
731, 743, 759A, 760, 767A, 8551, 8826, 8935

Item	Part Number	Description	Qty
1	842939	TEST BAR	6
2	842938	TRIPOD HEAD TEST PIN	3
3	842937	BUSHING	3
4	363-004	SPLIT LOCKWASHER, 1/2	12
5	842921	TRIPOD HEAD TEST PIN	3
6	833603	ADAPTER	1
7	833607	WASHER	12
8	321-011	HHCS, 3/8-16 X 1 LG	3
9	321-051	HHCS, 1/2-13 X 1 LG	6

Parts List – Figure 3J

When ordering replacement parts/kits, please specify model, serial number and color of your unit.

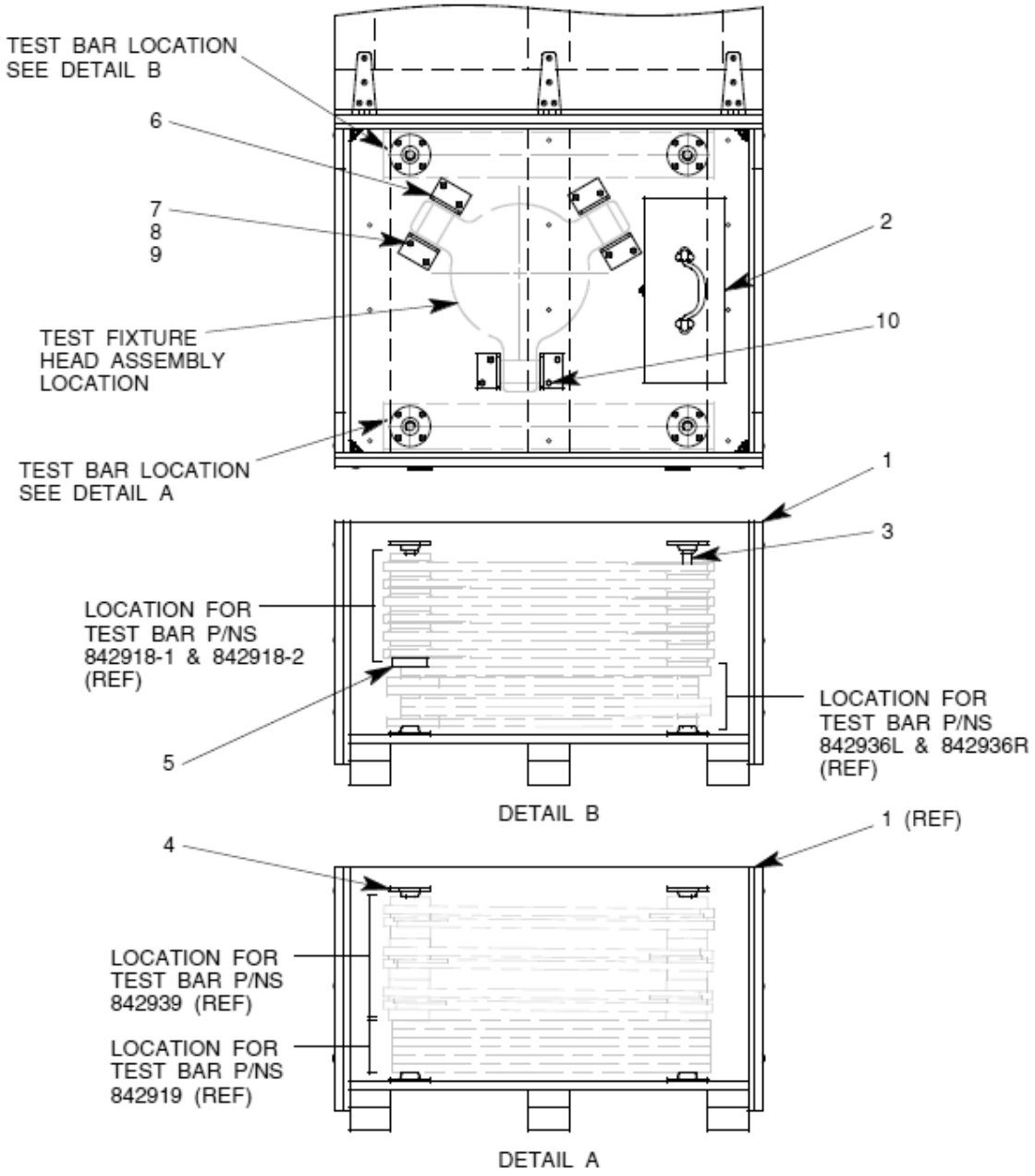


3 PLACES EACH ASSEMBLY FOR MALABAR TRIPOD JACK MODELS:
8863 & 8902
REMOVE TRIPOD HEAD LIFT RINGS AND LOCKNUTS PRIOR TO ASSEMBLY

Item	Part Number	Description	Qty
1	833602	ADAPTER	1
2	321-052	HHCS, 3/8-16 X 3 LG	3
3	842921	TRIPOD HEAD TEST PIN	3
4	363-004	SPLIT LOCKWASHER, 1/2	12
5	833607	WASHER	12
6	321-051	HHCS, 1/2-13 X 1 LG	12
7	833603	ADAPTER	1
8	321-011	HHCS, 3/8-16 X 1 LG	3

Parts List – Figure 3K

When ordering replacement parts/kits, please specify model, serial number and color of your unit.

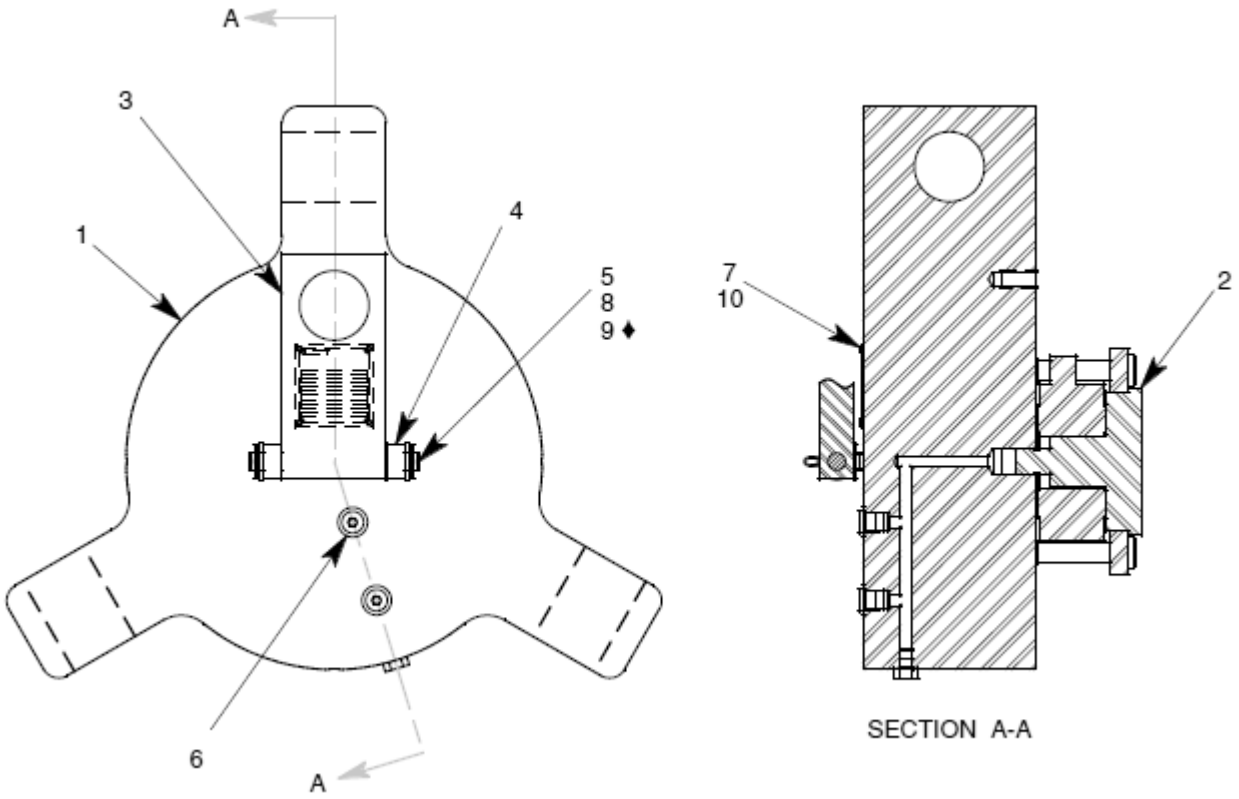


Item	Part Number	Description	Qty
1	842940-1	SHIPPING CONTAINER	1
2	499-026	TOOL BOX	1
3	711-124	PIPE NIPPLE, 1/2 NPT x 16" LG	4
4	729-140	PIPE FLOOR FLANGE, 1/2 NPT	8
5	842954	SPACER	1
6	842955	BRACKET, 1/4 x 3"	6
7	319-013	TRUSS HD BOLT, 1/4-20 x 1 1/2 L	28
8	361-028	FENDER WASHER, 1/4	28
9	351-001	HEX NUT, 1/4-20	28
10	390-114	LAG SCREW, 1/4 x 1 1/2 LG	2

Parts List – Figure 4A

When ordering replacement parts/kits, please specify model, serial number and color of your unit.

♦ **PART OF REPAIR PARTS KIT**



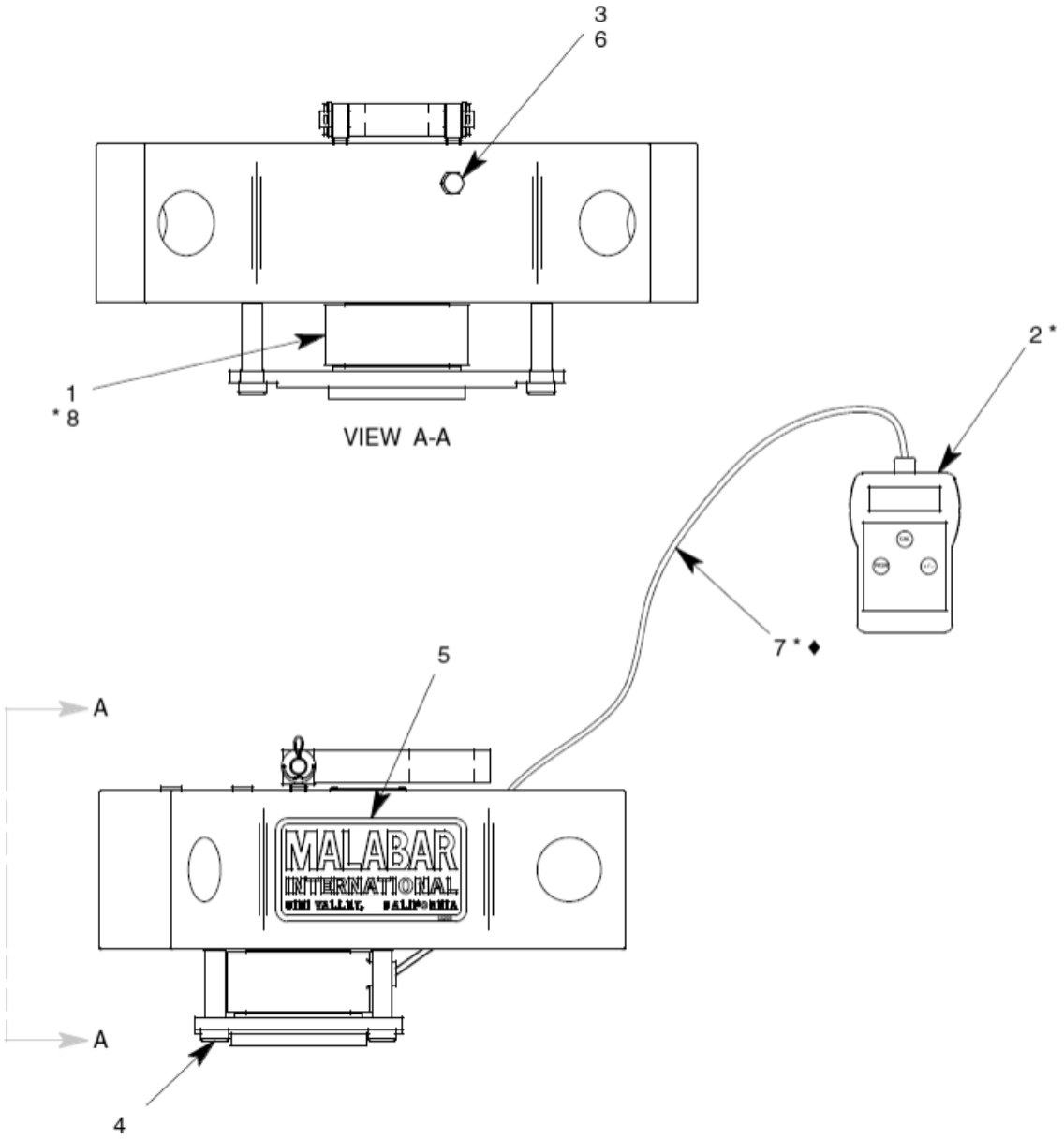
Item	Part Number	Description	Qty
	842901E	**Head Assembly;** *consists of:*	
1	842902	HAT	1
2	883309	LOAD CELL RETAINER	1
3	842915	LIFT BAR	1
4	842904	EAR	2
5	842916	LIFT RING PIN	1
6	717-023	PLUG, 3/8 SAE	2
7	393-007	DRIVE SCREW, #4 x 1/8 LG	4
8	362-005	FLAT WASHER, 1/2 SAE	2
9	372-002	COTTER PIN, 3/32 x 1" LG	2
10	WF9-7035	NAMEPLATE	1

Parts List – Figure 4

When ordering replacement parts/kits, please specify model, serial number and color of your unit.

* PART OF ELECTRONIC LOAS CELL SYSTEM PART NO. 450-762

♦ **PART OF REPAIR PARTS KIT**



Item	Part Number	Description	Qty
	842901E	**Head Assembly;** *consists of:*	
1	450-762	ELECTRONIC LOAD CELL SYS	1
2	450-764	MEASURING INSTRUMENT	1
3	717-009	PLUG, 3/16 SAE	1
4	330-013	SHOULDER BOLT	4
5	55998	STICKER, MALABAR	1
6	55925-903	O-RING	1
7	450-765	CABLE, 50' LG	1
8	450-763	ELECTRONIC LOAD CELL	1