

**“GREASE-FILLED”
ARMORED COAX TOW CABLE
TERMINATION MANUAL**

**Klein Associates, Inc.
11 Klein Drive
Salem, NH 03079
U.S.A.
Tel: 603-893-6131
Fax: 603-893-8807**

**www.kleinsonar.com
mail@kleinsonar.com**

January, 2003

**© Copyright 2003, Klein Associates, Inc.
All Rights reserved.**

Table of Contents

1. General Safety Precautions.....	4
1.1. Label Definitions.....	4
1.2. Cable Care And Safety.....	4
2. Tools, Materials and Work Area	6
2.1. Tools and Materials	6
2.2. Work Area	7
3. Mechanical Connection of Tow Cable	8
3.1. Bail Grip Installation	8
3.2. Initial Strain Relief Installation	8
3.3. Secure Cable In Vise and Install Sleeve	8
3.4. Prepare Outer Wires and Seat Outer Cone.....	9
3.5. Prepare Inner Wires and Seat Inner Cone	12
3.6. Install Hose Clamp around Wires	15
4. Electrical Connection of Coax Core.....	16
4.1. Cut Coax Core and Slide-on Rubber Bushings	16
4.2. Prepare Coax Shield	17
4.3. Prepare Coax Center Conductor	17
4.4. Temporarily Secure Bulkhead Connector Assembly	18
4.5. Connect Bulkhead Connector Lead.....	18
4.6. Position Bulkhead Connector Assembly.....	20
5. Final Assembly	22
5.1. Install Termination Housing over Assembly.....	22
5.2. Fill Cavity with Grease.....	24
5.3. Cable Termination Housing Protective Cover.....	26
5.4. Install and Secure Strain Relief	27
5.5. Install Spiral Wrap	28
5.6. Remaining Parts and Grease Adapter.....	28
5.7. Completed Cable Termination.....	28
6. Maintenance.....	29
6.1. Grease Levels	29

6.2. Bulkhead Connector	29
7. Winch-End Cable Termination.....	30
7.1. Removing Outer Armor	30
7.2. Remove Inner Armor	31
7.3. Insert Bushing and Overall Heat Shrink Tubing.....	32
7.4. Prepare Coax Core	33
8. APPENDIX	36
8.1. Drawings	36
8.2. Parts Lists (Bill of Materials).....	36

1. General Safety Precautions

1.1. Label Definitions.

There are three labels that will be utilized in this manual: NOTICE, CAUTION, and WARNING. The following is an explanation of the meaning of those labels:

NOTICE:

The use of "**NOTICE**" indicates that the following information is of interest to the operator and should be read.

CAUTION:

The use of "**CAUTION**" indicates that damage to the equipment will result from improper operation and that the following information should be read to preclude or prevent damage.

WARNING:

The use of "**WARNING**" indicates that injury or death could result from failure to follow instructions provided in the manual and that the following information should be read.

1.2. Cable Care And Safety.

The following are general safety precautions that are not related to any specific procedural step, and therefore, do not appear elsewhere within these instructions. These are recommended precautions that must be understood and applied during all phases of these procedures for the safety of the person(s) involved and for the protection of the cable. As required, specific **WARNING** and **CAUTION** notes are highlighted throughout these instructions: **WARNING** notes appearing within the procedural steps call attention to possible injury hazards which may result if the procedural steps are not correctly followed; **CAUTION** notes appearing within these instructions call attention to possible equipment damage which may result if specific procedural steps are not strictly followed.

GOGGLES MUST BE WORN DURING ALL PROCEDURES THAT REQUIRE THE CUTTING OF WIRES, THE POURING AND MIXING OF CAUSTIC MATERIALS, AND THE USE OF POWER TOOLS.

- PROLONGED OR REPEATED EXPOSURE TO OR CONTACT WITH CAUSTIC CHEMICALS MAY CAUSE IRRITATION AND/OR BURNS TO EYES, LUNGS, AND SKIN. Avoid prolonged breathing of chemical vapors, and always provide adequate ventilation. In case of contact, immediately flush skin or eyes with plenty of fresh water for a minimum of fifteen (15) minutes, and if irritation persists, seek medical attention.

CARELESS OR INEXPERIENCED OPERATION OF ELECTRICAL AND MECHANICAL TOOLS MAY LEAD TO UNNECESSARY INJURY. The use of such equipment must be under the direct supervision of experienced technicians/mechanics and always under the conditions required for safe operation.

2. Tools, Materials and Work Area

Klein offers tool kits for each cable size. See Appendix (Section 8.2) for complete listing of available tool kits.

2.1. Tools and Materials

2.1.1. Required Tools

.40" Cable Terminations:

- Driver, cone, ME243,ME256B (Klein P/N 13400054)
- Driver, cone, ME240B,ME231A, 248B, 243B (Klein P/N 13400055)
- Cable clamp (vise blocks), .38"-.43" (Klein P/N 13400053)

.45" Cable Terminations:

- Driver, cone, ME250A,ME262B, ME249A (Klein P/N 13400041)
- Driver, cone, ME244B, ME251B, ME253B (Klein P/N 13400052)
- Cable clamp (vise blocks), .50" - .56" (Klein P/N 13400058)

.525" Cable Terminations:

- Driver, cone, ME256A, ME253A, SP-563 (Klein P/N 13400051)
- Driver, cone, ME244B,ME251B, ME253B (Klein P/N 13400052)
- Cable clamp (vise blocks), .50" - .56" (Klein P/N 13400058)

.68" Cable Terminations:

- Driver, cone, ME268A,ME299B (Klein P/N 13400056)
- Driver, cone, ME262A, ME268B (Klein P/N 13400057)
- Cable clamp (vise blocks), .75" (Klein P/N 13400059)

Crimp tool (Thomas and Betts P/N WT111M or GB P/N GS-88)

Screwdriver, phillips (P2 Tip)

Safety glasses

Triangular file, 60 degree

Vise mounted to table / bench or C-clamps (to hold cable to table)
and Blocks of wood (to use with C-clamps)

Ballpeen hammer, medium

Drill, electric (hand held)

3.2mm (.125") drill bit

3mm (1/8") pin punch

Diagonal cutters, large, 200mm (8")

Indelible marker (black Sharpie pen)

Heat gun

Pliers, Medium

Razor blades

X-Acto knife

Flat tip screwdriver, Medium Tip

Grease gun, 3 Oz Cartridge size with 1/8 NPT male thread

Tape measure or scale

Scribe (hook and point ends helpful)

2.1.2. Recommended Tools

- Work light
- Ohm meter
- Drilling fluid
- Nut driver, (1/4")
- Nut driver, (9/32")
- Flat file, fine
- 5mm (3/16") pin punch
- Dremel tool with abrasive metal cutting disk(s)
- Wire strippers (18 to 10 AWG) for .40" to .525" cables
- Needle nose pliers, medium weight, 200mm (8")
- Scissors
- Cable Cutter (appropriate for cable diameter)

2.1.3. Required Materials

- Alcohol wipes or solvent to clean cable core
- Rags or paper towels
- Electrical tape

2.1.4. Recommended Materials

Anti-Seize grease

2.2. Work Area

Although it may be difficult in a field termination, having a clean work area with a workbench that is 2.5m (8') and a vise is recommended for the cable termination. Before starting the mechanical termination cover the work area with clean paper or paper towels, this will reduce the chance of contamination when working in the cable terminations. A bright work light is strongly recommended.

3. Mechanical Connection of Tow Cable

This section covers the mechanical attachment of the armored cable to the shackle.

3.1. Bail Grip Installation



Work bail grip (Item 3) onto the armored tow cable (Item 3), and slide it approximately 1-2 meters (3-6 ft.) down from the end of the cable. The loop end of the bail grip must face towards the end of the cable. Remove cable fairing as needed.

3.2. Initial Strain Relief Installation

Slide strain relief (Item 4) over end of cable.



3.3. Secure Cable In Vise and Install Sleeve

3.3.1. Hold Tow Cable in Cable Clamp



Place electrical tape or a hoseclamp above and below the cable clamp (vise jaws) to help keep the cable armor tightly wrapped.

Approx. 300mm (12") of cable should extend above the cable clamp (vise jaws).

3.3.2. Place Sleeve on Tow Cable / Wrap with Tape



Place sleeve (Item 6) on cable, then wrap tape 2 times around cable approx. 20mm (3/4") above sleeve. A hose clamp can be placed over the electrical tape for additional holding strength.

Note: Sleeve shapes will vary depending on your cable type and size. The sleeve on the left is for .40" to .525" cables, the right is for .68" cables

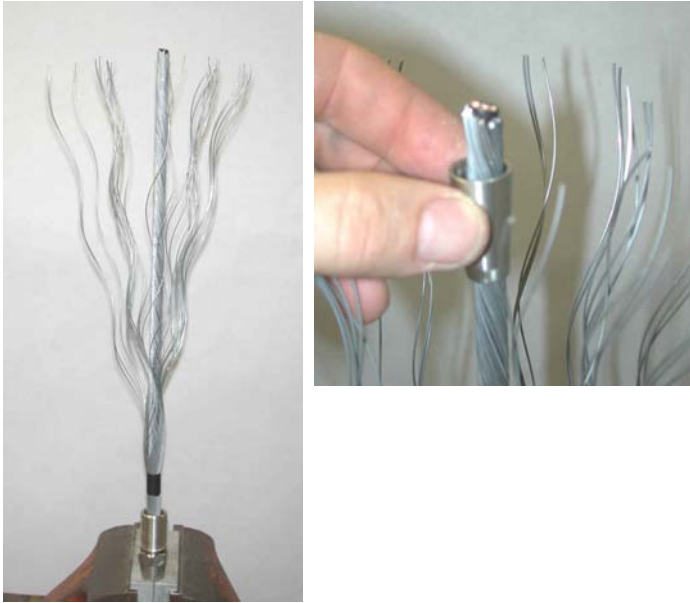
3.4. Prepare Outer Wires and Seat Outer Cone

3.4.1. Description of Dual Plug Set



The dual plug set consists of the large outer cone (Item 9A), the smaller inner cone (Item 9B), and the cable protector (spacer) tube (Item 9C).

3.4.2. Unwind Outer Armor Place Sleeve



Unwind wires one by one, keeping them from twisting. Next, slide the outer cone (Item 9A) over the end of the cable, down to the tape.

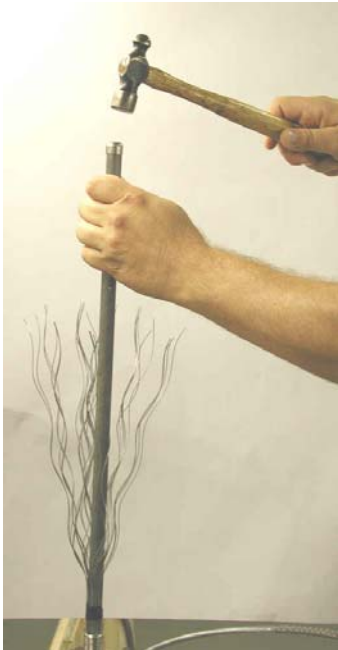
3.4.3. Position and Seat Outer Cone



Confirm that the wires are not crossed; then push the cone into place with the correct cone driver or properly sized steel tube. Loosen the tape if necessary.

The cone should now be positioned inside of the sleeve.

3.4.4. Hammer Outer Cone In Place



Confirm that the wires haven't crossed and are spaced evenly around the cone. Next use the cone driver, or properly sized steel tube if available, and a ballpeen hammer to fully seat the cone into the wires and sleeve. The cone should not be loose.

Note: Stainless steel armored cables may require more cone driving impact force than galvanized steel armor.

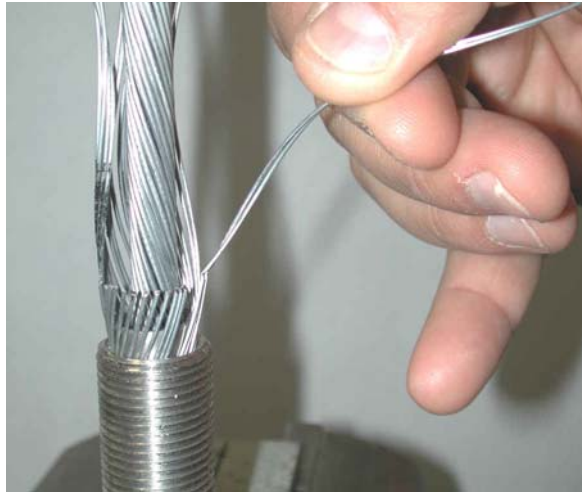
Remove cone driver.

3.4.5. Mark and Score Outer Wire



Mark the wires for cutting approx. 3mm (1/8") above the top of the cone. A Dremel Tool equipped with a cutting disk or a triangular shaped file may be used to score the wires about halfway through. Wire cutters may also be used. Wear safety glasses whenever scoring or cutting wires.

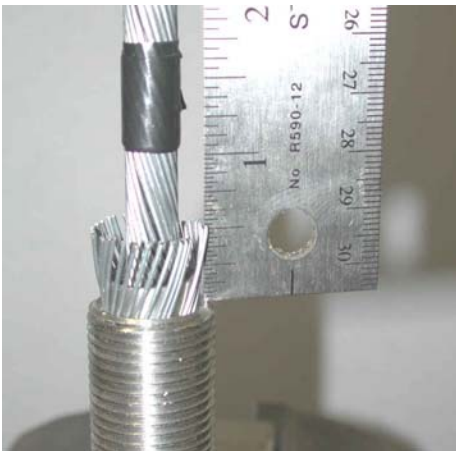
3.4.6. Remove Outer Wire



Individually flex the wires back and forth until they break free.

3.5. Prepare Inner Wires and Seat Inner Cone

3.5.1. Wrap Tape around Inner Wire and Unwind Inner Wire

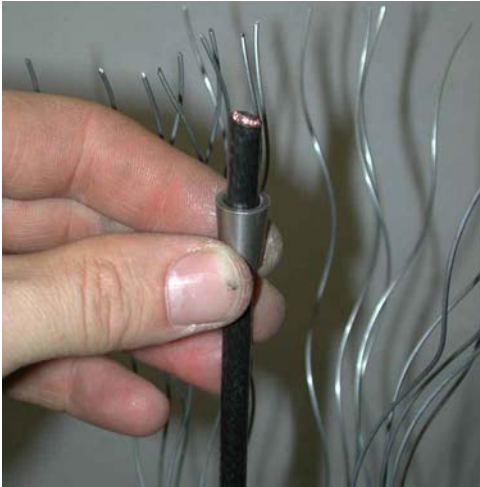


Wrap the first piece of tape 2 times around cable approx. 20mm (3/4") above sleeve.

Tightly wrap another piece of tape 3 or 4 times over the first. This will help hold the wires in place while they are being unwound. A hose clamp can be placed over the electrical tape for additional holding strength.

Unwind wires one by one, keeping them from twisting; then remove outer tape.

3.5.2. Place Inner Cone



Slide the inner cone (Item 9B) down over the end of the cable core.

Confirm that none of the wires are crossed; then push the cone into place with the correct cone driver **and** properly sized steel tube. Loosen the tape if necessary. The cone should now be positioned inside of the sleeve.

3.5.3. Hammer the Inner Cone In Place



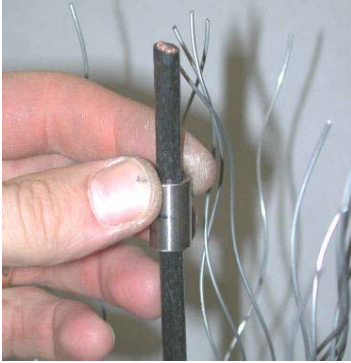
Confirm that the wires haven't crossed and are spaced evenly around the cone. Next use the cone driver, steel tube, and a ballpeen hammer to fully seat the cone into the wires and sleeve. The cone should not be loose.

Note: Stainless steel armored cables may require more cone driving impact force than galvanized steel armor.

Remove the cone driver and electrical tape.

3.5.4. Add Cable Protector Sleeve

Add the cable protector sleeve (spacer) (Item 9C).



3.5.5. Mark and Score Inner Wire



Mark the inner wire for scoring 3mm (1/8") below the top of the cable protector sleeve (spacer); then use a Dremel Tool equipped with a cutting disk or a triangular shaped file to score the wires about halfway through.

3.5.6. Remove Inner Wire



Individually flex the wires back and forth until they break free.

3.6. Install Hose Clamp around Wires

3.6.1. Cable Terminations using a **9/16" or Smaller Sleeve** (Item 6)

This includes: .40" & 525" armored cables.



- A. Install hose clamp (Item 12) approximately 3mm (1/8") below the ends of the inner wire.
- B. Apply a coat of Anti-Seize or other waterproof grease to ends of armor wires. This step is not required on stainless steel armored cables.

3.6.2. Cable Terminations using a **3/4" Sleeve** (Item 6)

This includes .68" armored cable.



- A. Due to the larger size of the cable core and metal protective sleeve (tube), approximately 7 strands of inner armor must be cut shorter than the others to allow room for the hose clamp to sit tight against the protective sleeve. See photo.



- B. Use pliers to bend several of the armor ends outwards at a 90 degree angle. This "hook" is used to retain the hose clamp, but must be kept less than 3mm (1/8") in length



C. Install hose clamp
(Item 12)

D. Apply a coat of Anti-Seize or other waterproof grease to ends of armor wires. This step is not required on stainless steel armored cables.

4. Electrical Connection of Coax Core

4.1. Cut Coax Core and Slide-on Rubber Bushings



Cut the coax core 160mm (6-1/4") from the top of the sleeve (all styles)

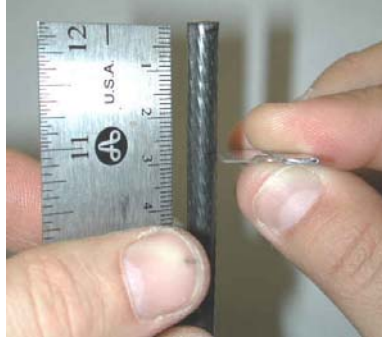
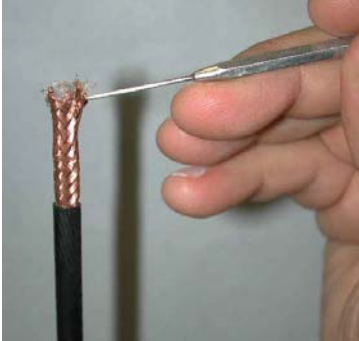
Clean the coax core jacket with alcohol.

Using a razor blade carefully cut the small and large rubber tubing (Items 24 and 25) to 20mm (3/4") long.

Slide the smaller diameter tubing (Item 24) onto cable core. The bottom of the tubing should be 57mm (2-1/4") above the top of the sleeve. Next slide on the larger diameter tubing completely over the smaller tubing. Bottom edges should be flush.

4.2. Prepare Coax Shield

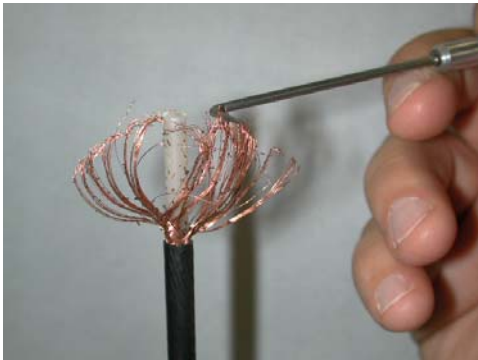
4.2.1. Mark and Remove Insulation



Mark and carefully remove outer jacket 28mm (1 1/8") from end of coax core. Be careful not to cut copper strands.

A heat gun may be used to soften the insulation.

4.2.2. Straighten Braid then Twist Wires



Use a scribe to straighten the strands of copper.

Twist conductors as shown.

4.3. Prepare Coax Center Conductor

4.3.1. Mark and Remove Insulation then Twist Center Conductor



Mark and carefully remove inner jacket 10mm (3/8") from end of coax core. A razor blade or wire stripper may be used to remove insulation. Be careful not to cut copper strands. A heat gun may be used to soften the insulation.

4.4. Temporarily Secure Bulkhead Connector Assembly



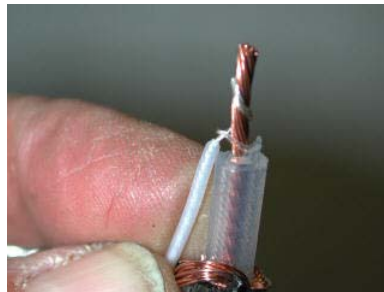
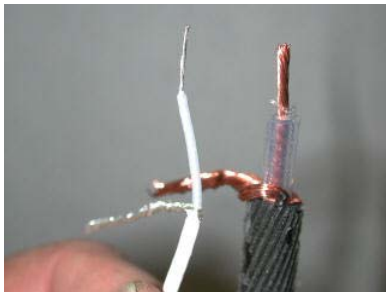
Use a cable tie (Item 22) to temporarily secure the bulkhead connector and tubing assembly (Item 2) as shown. This step will leave the installer free to use both hands during the crimping process.

Confirm that conductors from the white coax are stripped back properly. Refer to Assy Dwg , BHD Conn & Tube, (3/4" ID), 8 Pin Micro (15100936) in the Appendix of this manual.

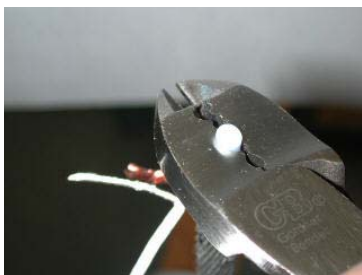
Note: Coax lead length from connector may vary.

4.5. Connect Bulkhead Connector Lead

4.5.1. Connect Coax Center Conductor



Wrap center conductors together as show



Place insulated crimp splice (Item 14) over ends of wire then crimp in-place using appropriate crimping tool. Pull on insulated center conductor to confirm positive connection.

4.5.2. Connect Coax Shield (Braid) Conductors.

Twist braid conductors as shown. It is important to leave slack in the smaller twisted conductors to allow for cable movement. See photo.





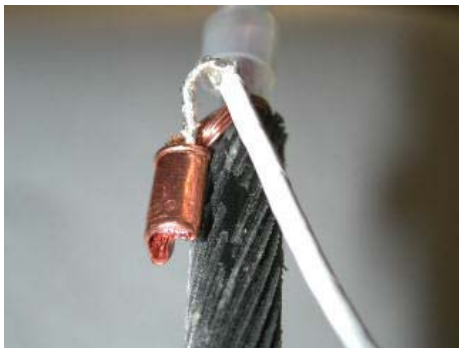
Position a large crimp splice (Item 15) sufficiently away from cable core jacket to allow it to be bent downward during a later step.



Trim excess wire protruding from crimp connector.



Use appropriate crimping tool to squeeze the crimp splice in place. The concave indentation in crimp splice should face downward. This will allow the cable core to “nest” inside the crimp when bent downward. If any braid conductors protrude from the crimp, trim them flush with cutters.



Bend the crimp splice downward against the coax cable core jacket. Note that the concave portion of the crimp splice “nests” against the core jacket.

4.5.3. Secure Wires



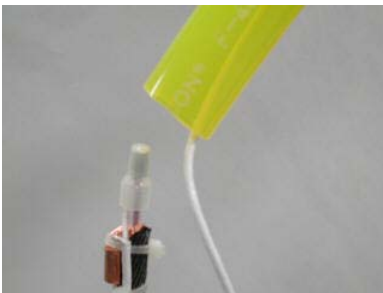
Use small cable tie (Item 23) to hold un-insulated crimp splice to coax core. Do not wrap the cable tie around the coax cable leading to the bulkhead connector assembly (Item 2).



Attach a second cable tie, below the un-insulated crimp splice as shown. Trim the ends of the cable ties flush.

4.6. Position Bulkhead Connector Assembly

4.6.1. Place Bulkhead Assy on Coax Core



Position Item 2 over rubber bushings (Items 24 and 25) as shown. Note: Coax lead from bulkhead connector (shown as white cable) is typically longer, allowing for additional re-terminations)

4.6.2. Adjust the Rubber Bushings



The rubber bushings (Items 24 and 25) should be flush with the end of the 25mm (1") diameter tubing from Item 2).

The top of the black Delrin connector holder should be 233mm (9-1/8") above the top of the sleeve

5. Final Assembly

5.1. Install Termination Housing over Assembly

5.1.1. Thread Termination Housing onto Sleeve



Re-position the entire assembly so that the vise holds the hex on the sleeve (Item 6). Remove cable clamps.

Apply Anti-Seize paste, lithium grease (Item 27) or silicone grease (Klein P/N 12700418) to threads of the sleeve, then screw-on the termination housing (Item 5). Make certain that the Bulkhead Connector Assembly (Item 2) does NOT rotate. The end of the termination housing (Item 5) should be flush with the threaded bushing (Item 10) or flush with the end of the threaded portion of the sleeve (Item 6), depending on which termination is used.

5.1.2. Precisely Position Termination Housing



A. Cable Terminations using a **9/16" or Smaller Sleeve** (Item 6) require the bottom edge of the Cable Termination Housing (Item 5) to be flush with the edge of the last thread on the Sleeve (Item 6). This is the point where the Sleeve's smooth turned section begins.



B. Cable Terminations using a **3/4" Sleeve** (Item 6) require the bottom edge of the Cable Termination Housing (Item 5) to be 15/16 inch (24mm) from the edge of the hex flat.

5.1.3. Install Flat-Head Screws



Rotate termination housing (Item 5) up to 3/4 a turn in either direction until grease gun access hole lines up with the grease fitting on the bulkhead connector assembly (Item 2). Rotating the housing more than this may prevent the strain relief (item 4) from installing properly. If the holes do not correctly line up, the bulkhead connector assembly (Item 2) can be carefully pushed or pulled into position.

Apply Loctite 242 (Item 40) to the threads of the two flat-head screws (Item 7) then install as shown. Tighten until snug, do not over-tighten or threads may become damaged. (Although not usually recommended for plastics, Loctite 242 can be used safely on this Delrin part (Item 2))

5.1.4. Drill and Install Two Groove Pins Coated with Loctite 277 (red)

Confirm that the end of the Termination Housing (Item 5) is flush with end of threaded portion of the sleeve (Item 6). Rotate the Termination Housing as necessary to make surfaces flush. If more than 1 turn is required, the two screws (Item 7) must first be removed to allow the Termination Housing (Item 5) to rotate freely around the (black delrin) Bulkhead Connector Assembly (Item 2). Then push or pull Item 2 so that the M6 holes line up again. Reinstall the two M6 screws (Item 7).



Hold or clamp the Termination Housing securely, while drilling through the groove pin pilot hole. Drill the holes slowly, and use plenty of drilling fluid. Keep the drill aligned with the hole, and stop often to clean the chips from the drill bit. Breaking a drill bit at this point is highly undesirable

Apply red Loctite (Item 26) to the groove pin (Item 8); insert smooth end first, then hammer in place, using the pin punch and ballpeen hammer. Repeat above steps for the second groove pin.

Use a flat file to remove any burrs on the termination housing.

5.2. Fill Cavity with Grease

5.2.1. Install Hose Clamp



It may be necessary to bend the end of the hose clamp (Item 13) slightly with a set of pliers in order to aid insertion into the hose clamp housing; use a screwdriver tip to assist. For now, leave the hose clamp loose enough to slide up and down the 25mm (1") tube.

5.2.2. Fill Termination with Grease

Lay the termination housing (Item 5) on a horizontal surface to facilitate consistent flow of grease.



Setup the grease gun with the flush grease fitting adapter (Item 28) and a warm cartridge of grease (Item 27). In general, the warmer the grease, the better it will flow into the termination housing.

Next, press the tip into the grease fitting and begin pumping.



The grease should evenly fill the cavity, pushing air out the end of the tube near the loose hose clamp (Item 13). Stop pumping when air is no longer visible inside the tube and the 25mm (1") tube begins to bulge slightly. It is normal for small amounts of grease to ooze out in between the rubber

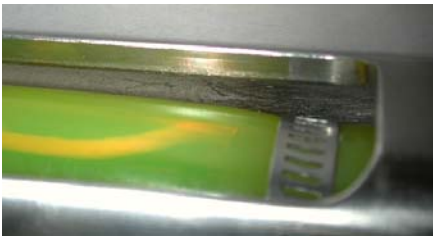
spacers. In addition, it may be necessary to pump through a volume of grease if it is suspected that many air bubbles or air pockets are present. This is usually due to the injected grease being too viscous (thick). In this case, warm the grease cartridge and the cable termination (if possible) and begin to pump again. A small wire can

be used in between the rubber spacers to create a temporary vent, allow an opening for the grease to escape. Wipe up excess grease with a paper towel or rag, and dispose of safely.

The 25mm (1") tube should have a slight bulge when finished pumping.

Leave a dab of grease over the grease fitting

5.2.3. Tighten the Hose Clamp



Center hose clamp over 20mm (3/4") long tubing (Item 25); then tighten snug so that the OD of the hose clamp is flush with the OD of the PVC tubing.

CAUTION Do NOT over tighten hose clamp, or 25mm (1") tube will begin to extrude through

slots in hose clamp.

5.2.4. Hose Clamp Alternative.



Two cable ties (Item 22) may be used if the hose clamp (Item 13) is unavailable. Trim ends of cable ties flush.

5.3. Cable Termination Housing Protective Cover



Some Cable Termination Kits comes with an impact resistant cover (Item 41) to prevent water from rapidly flowing through the Termination Housing This can be particularly important during high speed operations (5+ knots) where water flow can induce damaging cable strum within the cable termination. The protective cover will also help keep dirt and debris away from the grease fitting.

To install, slide the Cover (Item 41) over the Cable Termination Housing (Item 5). The part should be slid on so that the small hole in the end of the Cover (Item 5) should be on the free end of the termination. See photo.

Secure the Cover (Item 41) by passing a Cable Tie (Item 22) thru the small hole in the cover and around the Termination Housing as shown



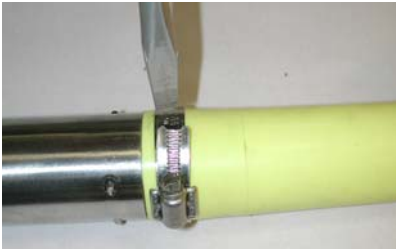
5.4. Install and Secure Strain Relief

5.4.1. Work Strain Relief over Sleeve Hex



Secure the termination housing in a vise or to a rigid structure, then carefully use a heat gun to soften the urethane strain relief (Item 4) so that it slips over the sleeve. A fair amount of force may be needed.

5.4.2. Secure with Hose Clamp



After the urethane has cooled, secure the strain relief with a hose clamp (Item 11) as shown.

5.4.3. Cover Hose Clamp with Heat Shrink



Position the 2" diameter x 3" long piece of heat shrink tubing (Item 17) about 12mm (1/2") beyond groove pins (Item 8) and shrink in place. Note: Heat shrink color typically matches strain relief.

5.5. Install Spiral Wrap



The spiral wrap will protect the fine wires from wearing and breaking over time and will provide a welcome barrier for ungloved hands. Position the Bail grip in the desired location; then begin applying the spiral wrap as shown. Consider the length of the safety cable to the towfish.



If applicable, remove interfering ribbon fairing from the tow cable.

5.6. Remaining Parts and Grease Adapter

After factory cable terminations, place grease fitting adapter (Item 28) in a Zip-Loc bag (Item 29), and secure it to the termination housing with a cable tie (Item 22).

5.7. Completed Cable Termination

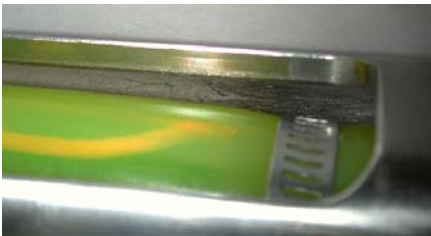


Protective cover (Item 41) not shown.

6. Maintenance

6.1. Grease Levels

Periodically inspect the grease-filled tube. The 25mm (1") diameter tube should be round throughout its length. If it is not, slide the clear heat shrink tubing to the side, and add grease through the grease fitting; see section 5.2.2. If the recommended grease is not available, other medium-soft or softer greases (NLGI 2 or less) with high dielectric strength may be used. Electrical tape may be used in place of heat shrink tubing.



Periodically check the grease level in the vinyl grease-filled tube. The tube should be firm but bulging or feel mushy when pinched

6.2. Bulkhead Connector

6.2.1. Clean and Grease Connectors

Keep the connector pins clean and lightly coated with DC-4 silicone grease. This is not the same grease used inside of the termination. Warning: Over-greasing connector pins may permanently damage connector sockets

6.2.2. Mating Connector

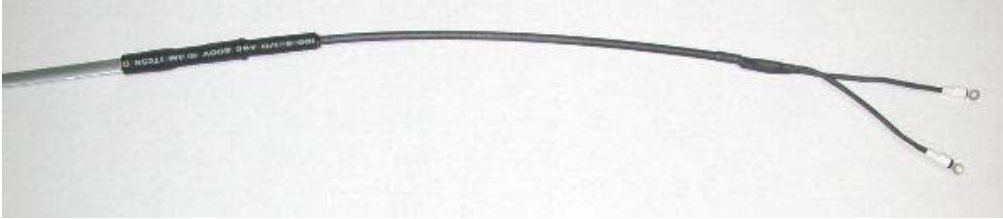
If initial mating of the cable connector to the bulkhead connector is difficult, try using a pair of round screw driver shafts to grasp the connector by the cable and to apply axial force.

6.2.3. Removing Connector

Always part connectors by pulling the connector body and not the cable itself. Pull straight out without bending connector from side to side. This is good practice for any connector set.

7. Winch-End Cable Termination

Use the following instructions to prepare the towcable for testing and connection to the winch junction box. Completed winch-end termination shown below.



7.1. Removing Outer Armor

7.1.1. Mark Cut Location



Tightly wrap electrical tape approximately 600mm (24 in) from the end of the armored towcable on the winch-end. A hose clamp (item 42) not shown, can be affixed approximately 100mm (4 in) from the tape (on the towfish side of the tape) for additional securing force.

7.1.2. Score Outer Armor



Use a Dremel tool or triangular file to score the outer armor. It is usually only necessary to score 1/3 to 1/2 of the way through the armor.

7.1.3. Remove Outer Armor.



Flex armor until it work hardens and snaps free.

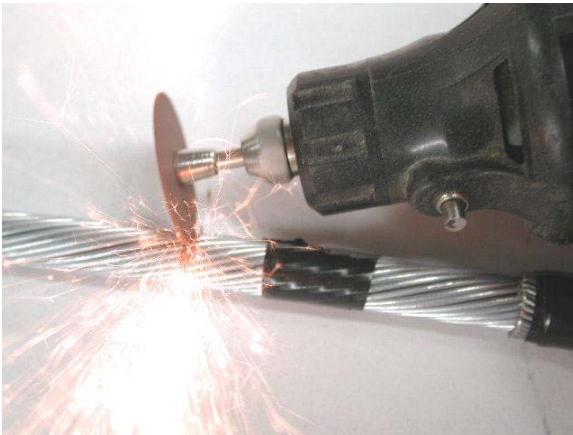
7.2. Remove Inner Armor

7.2.1. Prepare for Cutting of Inner Armor



Tightly wrap electrical tape and mark cable as shown

7.2.2. Cut Inner Armor



Use a Dremel tool or triangular file to score the outer armor. It is usually only necessary to score 1/3 to 1/2 of the way through the armor. CAUTION: Do not cut all the way through the armor or the jacket of the cable core may be damaged.

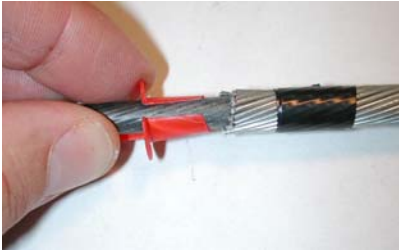
7.2.3. Remove Inner Armor



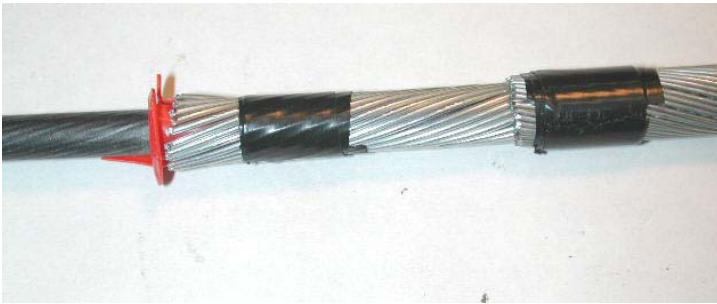
Flex armor until it work hardens and snaps free.

7.3. Insert Bushing and Overall Heat Shrink Tubing

7.3.1. Install Anti-Short Bushing



Insert the Anti Short Bushing (Item 31) under the inner armor wires as shown.



7.3.2. Install heat Shrink Tubing



Cut thickwall adhesive lined Heat Shrink Tubing (Item 32) to 115mm (4.5in) and slide over cable end as shown.



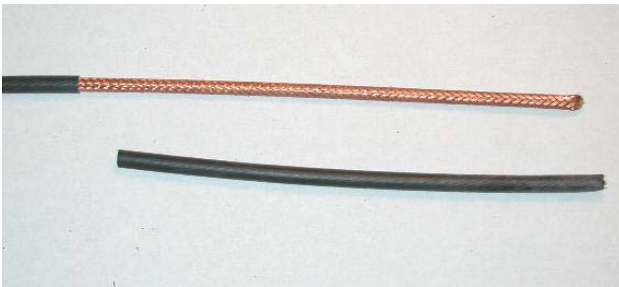
Use heat gun to shrink tubing in place as shown.

7.4. Prepare Coax Core

7.4.1. Remove Coax Cable Core Jacket



Carefully remove approximately 175mm (7in) of the cable core jacket (Item 1). Do not damage the copper braid.



7.4.2. Prepare Copper Braid



Use a scribe to separate out the strands of copper.



Twist the copper strands and trim the end

7.4.3. Prepare the Center Conductor



Mark the center conductor insulation at approximately 25mm (1in) as shown



Use wire strippers to carefully remove the center conductor insulation in short sections. Applying heat from a heat gun will also help.

7.4.4. Add Crimp Connectors



Install crimp connectors (Item 36) as shown

7.4.5. Add Heat Shrink Tubing

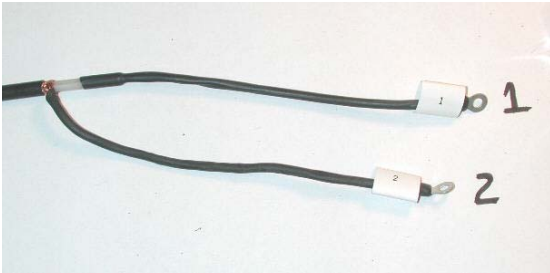


Cut Heat Shrink Tubing (Item 34) to length as shown. Slide over braid and center conductor and cover the crimped portion of the crimp connectors (Item 36)



Use heat gun to shrink tubing in place

7.4.6. Add Lead Numbers and Final Heat Shrink Tubing



Correctly add adhesive or heat shrink lead numbers, (not supplied), around crimp connectors (Item 36). CAUTION: The #1 label must be on the center conductor and the #2 label must be on the coax braid (shield).



Cut Heat Shrink tubing (Item 33) to length.



Use heat gun to shrink tubing in place

7.4.7. Final Test



Test for continuity as shown in the table. The winch-end termination of the cable is now complete.

8 Pin Micro Bulkhead Connector	Winch-End Leads
Pin 1	Wire #1
Pin 2	Wire #2

8. APPENDIX

Drawings and Parts Lists contained within this manual are for reference only. See the Drawings and Parts Lists that were included with the hardware delivery for specific information related to your hardware configuration.

8.1. Drawings

14600209	outline dwg, cable term, bhd conn, armored, coax
15101000	assy dwg, cable term, bhd conn, armored, coax
14600193	outline dwg, cable term, bhd conn, armored, coax
15100963	assy dwg, cable term, bhd conn, armored, coax
15102920	assy dwg, bhd conn & tube (3/4" ID), 8 pin micro

8.2. Parts Lists (Bill of Materials)

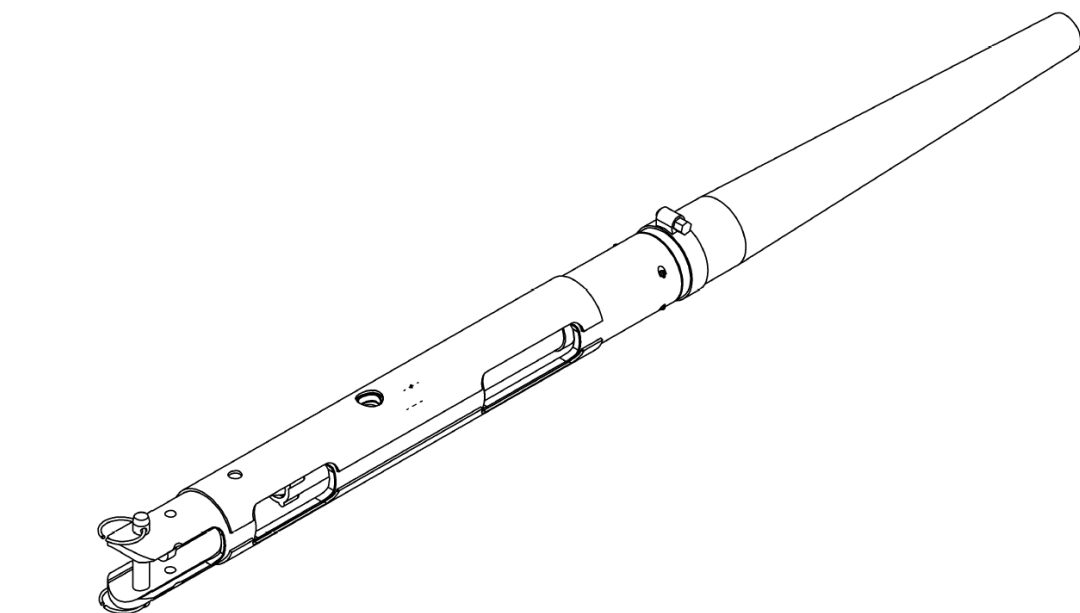
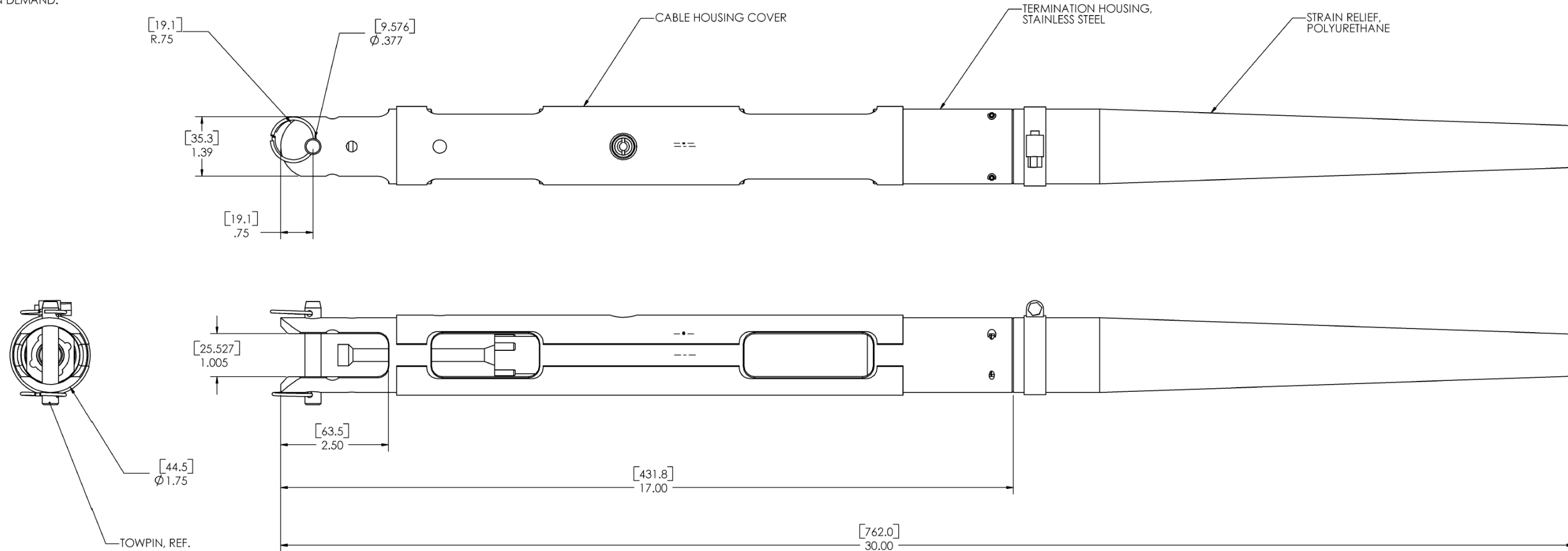
14102919	assy, cable term, bhd conn, armored, coax, .40"
14102947	assy, cable term kit, bhd conn, armored, coax, .40
14103049	assy, cable repl kit, bhd conn, armored, coax, .40
14103046	assy, cable term kit, bhd conn, armored, coax, .45"
14103093	assy, cable term repl kit, bhd conn, armored, coax, .45"
14103091	assy, cable term kit, bhd conn, armored, coax, .499"
14103092	assy, cable term repl kit, bhd conn, armored, coax, .499"
14102967	assy, cable term, bhd conn, armored, coax, .525
14102965	assy, cable term kit, bhd conn, armored, coax, .525
14102979	assy, cable term repl kit, bhd conn, armored, coax, .525
14103017	assy, cable term, bhd conn, armored, coax, .68
14103037	assy, cable term kit, bhd conn, armored, coax, .68
14103038	assy, cable repl kit, bhd conn, armored, coax, .68
14102920	assy, bhd conn & tube (3/4" ID), 8 pin micro

"Klein Associates, Inc. 2001, 2002

PROPRIETARY NOTICE

THIS DOCUMENT, WHETHER PATENTABLE OR NON-PATENTABLE SUBJECT MATTER, EMBODIES PROPRIETARY AND CONFIDENTIAL INFORMATION AND IS THE EXCLUSIVE PROPERTY OF KLEIN ASSOCIATES, INC. IT MAY NOT BE REPRODUCED, USED OR DISCLOSED TO OTHERS FOR ANY PURPOSE EXCEPT THAT FOR WHICH IT IS LOANED, AND IT SHALL BE RETURNED ON DEMAND.

REVISIONS				
REV	ECN NO.	DESCRIPTION	APPROVED	DATE
00	2117	RELEASE TO PRODUCTION	-	-
01	2139	ADDED CBL HSG COVER, DESC CHG.	-	-



ITEM	REF DES	QTY	PART NUMBER	DESCRIPTION	REMARKS
PARTS LIST					
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES			MATERIAL:		
TOLERANCE ON DEC ANGLES			FINISH SPECS:		
FRAC.	DEC.	ANGLES	NAME DATE		
TOL .XX	± .XX	± TOL	DRAWN	C. DUNDORF	10/22/01
.XXX	± .XXX		CHECKED	-	-
SURFACES			APPROVED	-	-
METRIC REFERENCE			UNLESS OTHERWISE SPECIFIED COMMERCIAL PUBLISHED TOLERANCES SHALL APPLY TO RUBBER, BAR, PLATE, ETC. PARTS MUST FIT GAGES AND MEET SPECIFIED TOLERANCES.		
INCHES (mm) & IN (mm)			BREAK ALL SHARP EDGES		
VARIOUS			DEBURR ALL HOLES		
14102979			CODE IDENT NO.		
14102965			SIZE		
14102967			DRAWING NO.		
N61331-01-C-0022			REV		
CONTRACT NUMBER			USED ON		
			52315 D		
			14600193		
			01		
			DO NOT SCALE PRINT		
			SCALE NTS		
			SHT 1 OF 1		

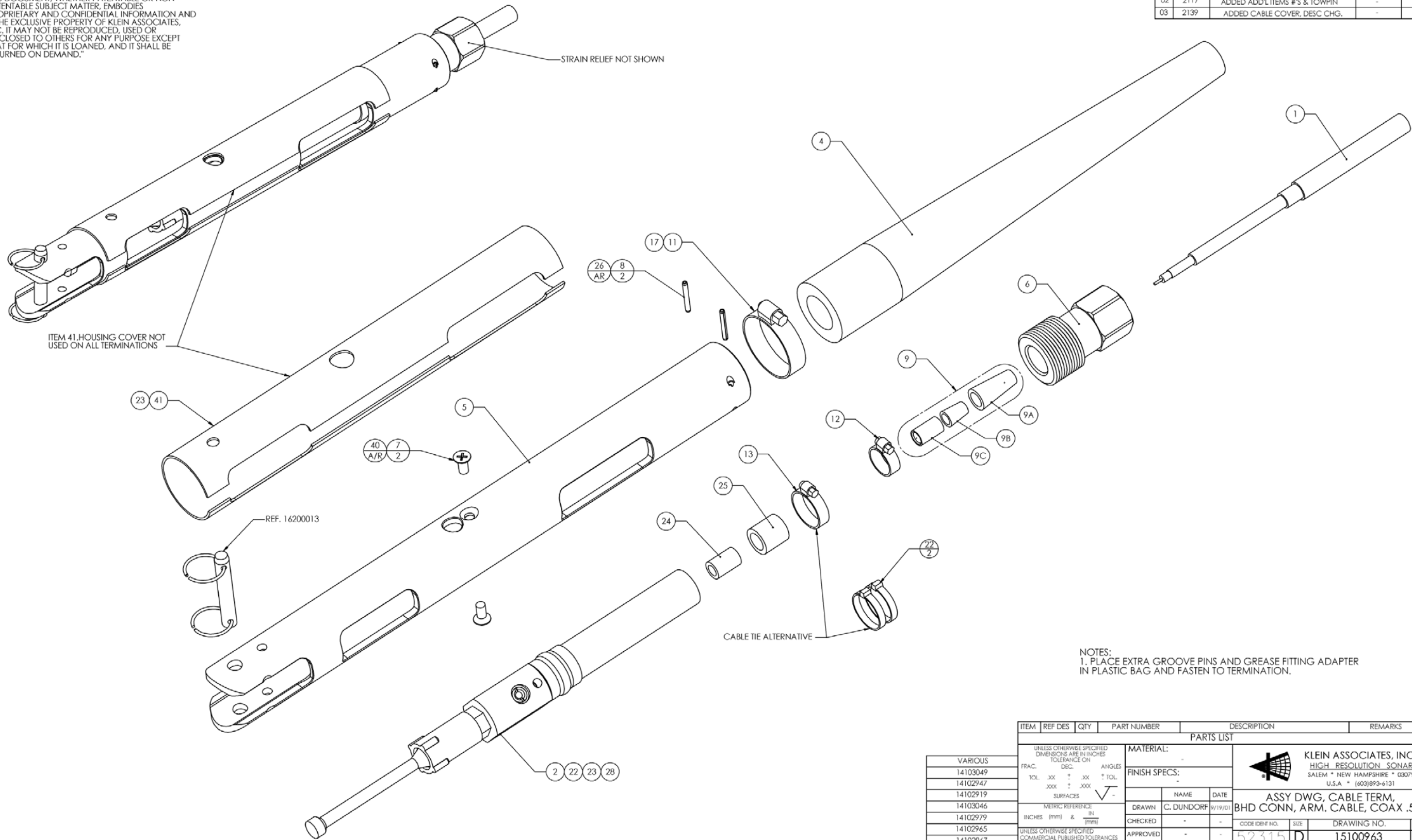
KLEIN ASSOCIATES, INC.
HIGH RESOLUTION SONAR
SALEM * NEW HAMPSHIRE * 03079
U.S.A * (603)893-6131

**OUTLINE DWG, CABLE TERM,
BHD CONN, ARMORED, COAX**

"Klein Associates, Inc. 2001
 PROPRIETARY NOTICE

THIS DOCUMENT, WHETHER PATENTABLE OR NON-PATENTABLE SUBJECT MATTER, EMBODIES PROPRIETARY AND CONFIDENTIAL INFORMATION AND IS THE EXCLUSIVE PROPERTY OF KLEIN ASSOCIATES, INC. IT MAY NOT BE REPRODUCED, USED OR DISCLOSED TO OTHERS FOR ANY PURPOSE EXCEPT THAT FOR WHICH IT IS LOANED, AND IT SHALL BE RETURNED ON DEMAND."

REVISIONS				
REV	ECN NO.	DESCRIPTION	APPROVED	DATE
00	2117	RELEASE TO PRODUCTION	-	-
01	2117	UP-REV TO MATCH BOM	-	-
02	2117	ADDED ADD'L ITEMS #'S & TOWPIN	-	-
03	2139	ADDED CABLE COVER, DESC CHG.	-	-



NOTES:
 1. PLACE EXTRA GROOVE PINS AND GREASE FITTING ADAPTER IN PLASTIC BAG AND FASTEN TO TERMINATION.

ITEM	REF DES	QTY	PART NUMBER	DESCRIPTION	REMARKS
PARTS LIST					
VARIOUS				UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCE ON DEC. ANGLES	
14103049				TOL. .XX ± .XX ± TOL.	
14102947				.XXX ± .XXX	
14102919				SURFACES	
14103046				METRIC REFERENCE IN INCHES (mm) & IN (mm)	
14102979				UNLESS OTHERWISE SPECIFIED COMMERCIAL PUBLISHED TOLERANCES SHALL APPLY TO TUBING, BAR, PLATE, ETC. PARTS MUST FIT GAUGES AND MEET SPECIFIED TOLERANCES.	
14102965					
14102967					
USED ON					

MATERIAL:		NAME		DATE	
FINISH SPECS:		DRAWN		C. DUNDORF 9/19/01	
CHECKED		APPROVED		CODE IDENT NO.	
BREAK ALL SHARP EDGES		DEBURR ALL HOLES		52315	

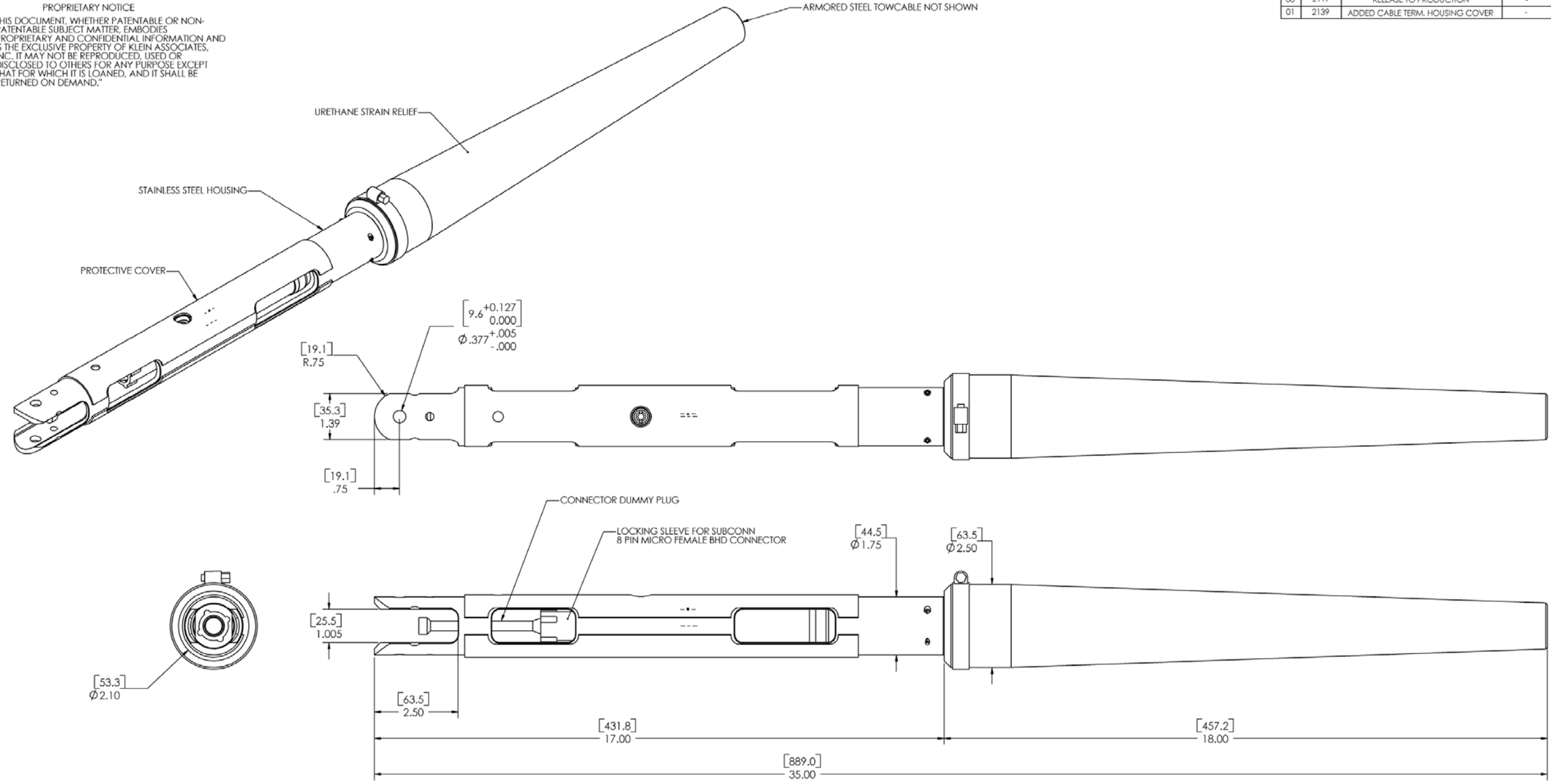
KLEIN ASSOCIATES, INC. HIGH RESOLUTION SONAR SALEM * NEW HAMPSHIRE * 03079 U.S.A * (603)893-6131		
ASSY DWG, CABLE TERM, BHD CONN, ARM. CABLE, COAX .525		
SIZE	DRAWING NO.	REV
D	15100963	02
DO NOT SCALE PRINT	SCALE NTS	SHT 1 OF 1

"Klein Associates, Inc. 2002

PROPRIETARY NOTICE

THIS DOCUMENT, WHETHER PATENTABLE OR NON-PATENTABLE SUBJECT MATTER, EMBODIES PROPRIETARY AND CONFIDENTIAL INFORMATION AND IS THE EXCLUSIVE PROPERTY OF KLEIN ASSOCIATES, INC. IT MAY NOT BE REPRODUCED, USED OR DISCLOSED TO OTHERS FOR ANY PURPOSE EXCEPT THAT FOR WHICH IT IS LOANED, AND IT SHALL BE RETURNED ON DEMAND."

REVISIONS				
REV	ECN NO.	DESCRIPTION	APPROVED	DATE
00	2117	RELEASE TO PRODUCTION	-	-
01	2139	ADDED CABLE TERM. HOUSING COVER	-	-



ITEM	REF DES	QTY	PART NUMBER	DESCRIPTION	REMARKS
PARTS LIST					
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCE ON			MATERIAL:		
FRAC.	DEC.	ANGLES	FINISH SPECS:		
TOL. XX	± .XX	± TOL.	NAME DATE		
.XXX	± .XXX		DRAWN C. DUNDORF 5/22/02		
SURFACES			CHECKED - -		
METRIC REFERENCE			APPROVED - -		
INCHES (mm) & IN (mm)			CODE IDENT NO.	SIZE	DRAWING NO.
14103018			52315	D	14600209
14103037			DO NOT SCALE PRINT SCALE NTS SHIT 1 OF 1		
14103017					
USED ON					

KLEIN ASSOCIATES, INC.
 HIGH RESOLUTION SONAR
 SALEM * NEW HAMPSHIRE * 03079
 U.S.A * (603)893-6131

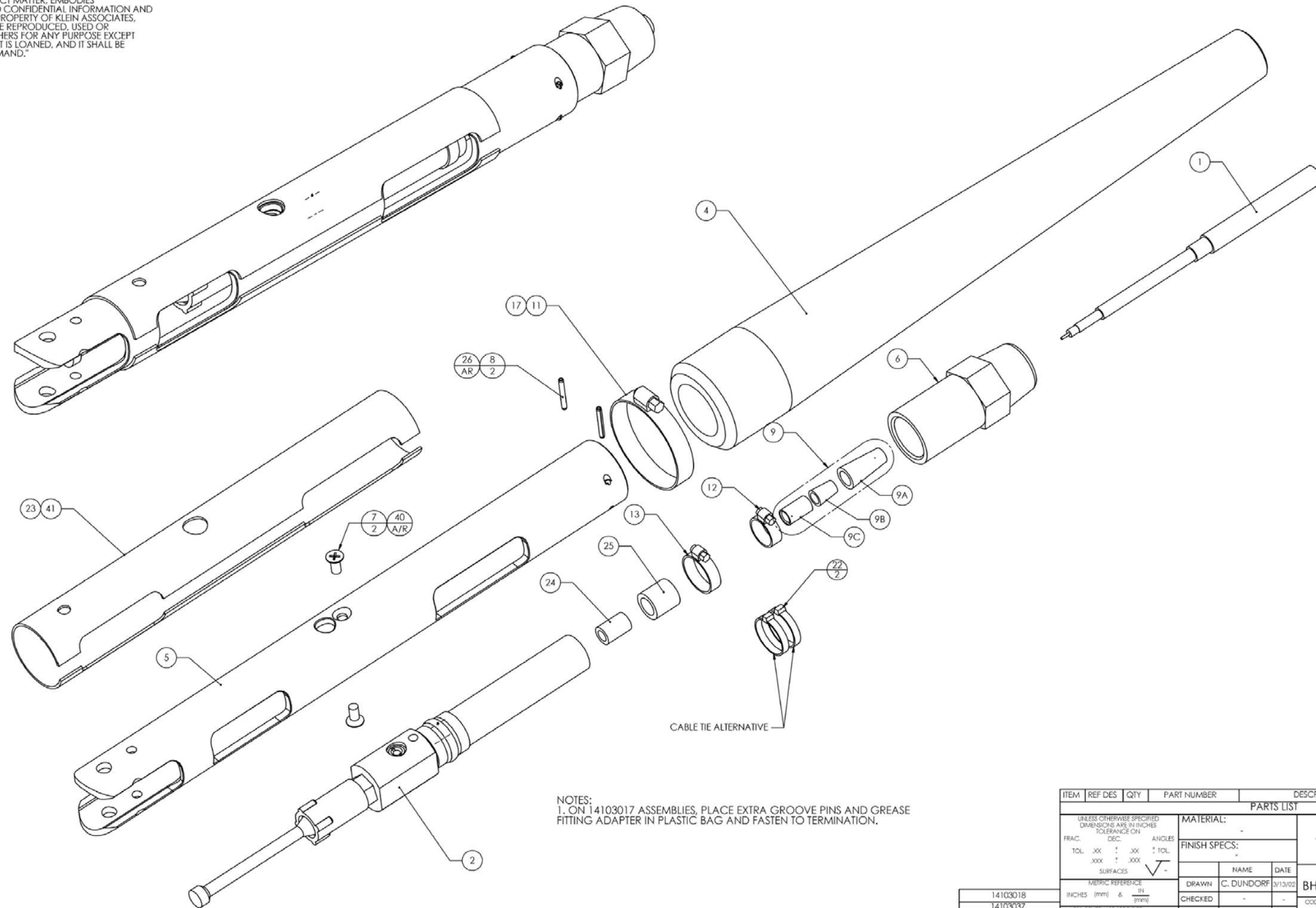
OUTLINE DWG, CABLE TERM,
 BHD CONN, ARM. CABLE, COAX .68

Klein Associates, Inc. 2002

PROPRIETARY NOTICE

THIS DOCUMENT, WHETHER PATENTABLE OR NON-PATENTABLE SUBJECT MATTER, EMBODIES PROPRIETARY AND CONFIDENTIAL INFORMATION AND IS THE EXCLUSIVE PROPERTY OF KLEIN ASSOCIATES, INC. IT MAY NOT BE REPRODUCED, USED OR DISCLOSED TO OTHERS FOR ANY PURPOSE EXCEPT THAT FOR WHICH IT IS LOANED, AND IT SHALL BE RETURNED ON DEMAND.

REVISIONS				
REV	ECN NO.	DESCRIPTION	APPROVED	DATE
00	2117	RELEASE TO PRODUCTION	-	-
01	2139	ADDED CABLE TERM. HOUSING COVER	-	-



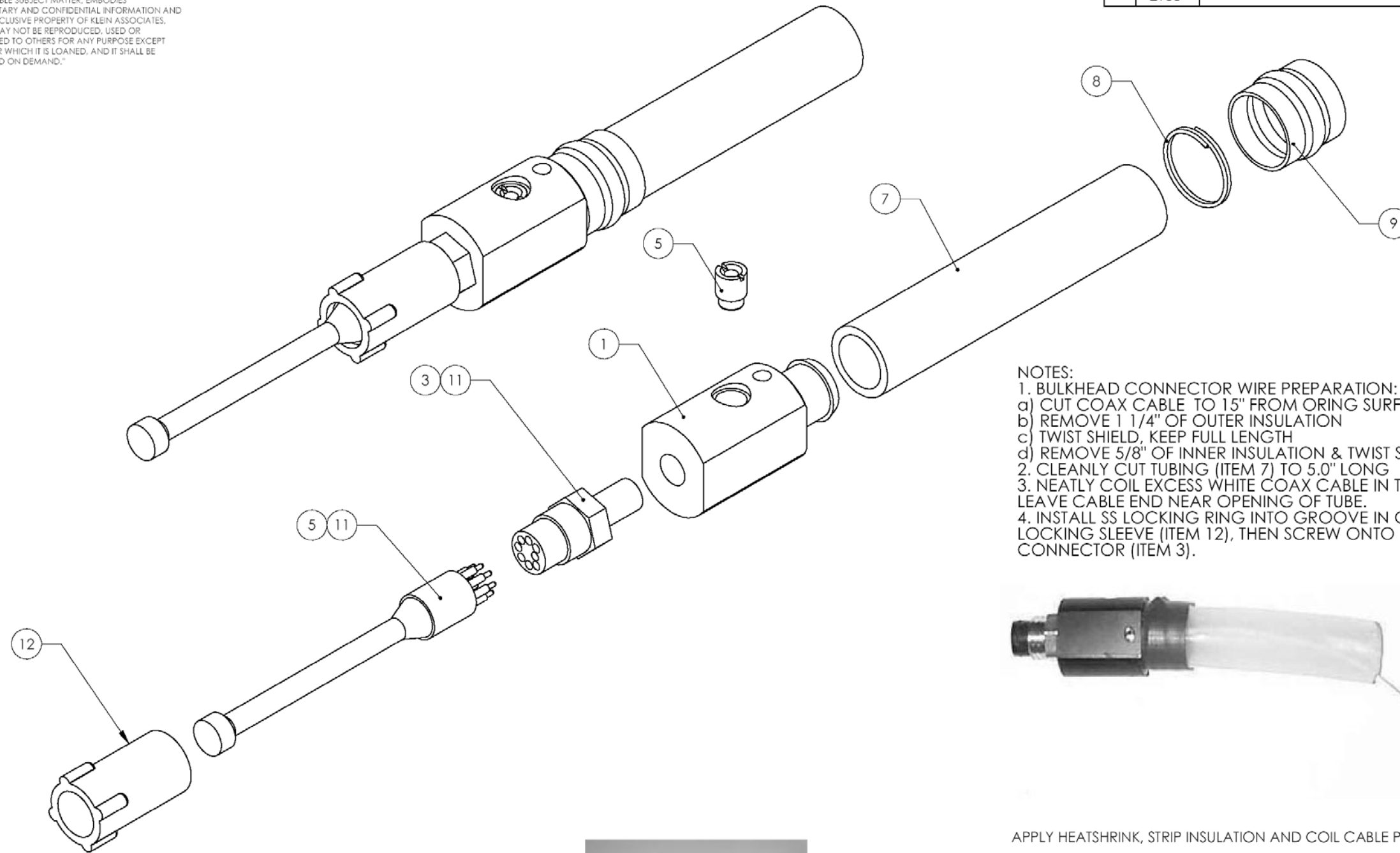
NOTES:
 1. ON 14103017 ASSEMBLIES, PLACE EXTRA GROOVE PINS AND GREASE FITTING ADAPTER IN PLASTIC BAG AND FASTEN TO TERMINATION.

ITEM	REF DES	QTY	PART NUMBER	DESCRIPTION	REMARKS
PARTS LIST					
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCE ON			MATERIAL:		
FRAC.	DEC.	ANGLES	FINISH SPECS:		
TOL. .XX ± .XX	± .XX	± TOL.	NAME		
.XXX ± .XXX	± .XXX	± TOL.	DATE		
SURFACES			DRAWN C. DUNDORF 3/13/02		
METRIC REFERENCE IN INCHES (mm) & (mm)			CHECKED - -		
UNLESS OTHERWISE SPECIFIED COMMERCIAL PUBLISHED TOLERANCES SHALL APPLY TO TUBING, BAMP, PLATE, ETC. PARTS MUST FIT GAGES AND MEET SPECIFIED TOLERANCES.			APPROVED - -		
USED ON			BREAK ALL SHARP EDGES		
			DEBURR ALL HOLES		
KLEIN ASSOCIATES, INC.		HIGH RESOLUTION SONAR			
SALEM * NEW HAMPSHIRE * 03079		U.S.A * (603)893-6131			
ASSY DWG, CABLE TERM, BHD CONN, ARM, CABLE, COAX .68					
CODE/ID# NO.	SIZE	DRAWING NO.		REV	
52315	D	15101000		01	
DO NOT SCALE PRINT		SCALE	NTS	SHT 1 OF 1	

"Klein Associates, Inc. 2001, 2002
 PROPRIETARY NOTICE

THIS DOCUMENT, WHETHER PATENTABLE OR NON-PATENTABLE SUBJECT MATTER, EMBODIES PROPRIETARY AND CONFIDENTIAL INFORMATION AND IS THE EXCLUSIVE PROPERTY OF KLEIN ASSOCIATES, INC. IT MAY NOT BE REPRODUCED, USED OR DISCLOSED TO OTHERS FOR ANY PURPOSE EXCEPT THAT FOR WHICH IT IS LOANED, AND IT SHALL BE RETURNED ON DEMAND."

REVISIONS				
REV	ECN NO	DESCRIPTION	APPROVED	DATE
00	2138	RELEASE TO PRODUCTION		



- NOTES:
 1. BULKHEAD CONNECTOR WIRE PREPARATION:
 a) CUT COAX CABLE TO 15" FROM ORING SURFACE
 b) REMOVE 1 1/4" OF OUTER INSULATION
 c) TWIST SHIELD, KEEP FULL LENGTH
 d) REMOVE 5/8" OF INNER INSULATION & TWIST STRANDS
 2. CLEANLY CUT TUBING (ITEM 7) TO 5.0" LONG
 3. NEATLY COIL EXCESS WHITE COAX CABLE IN TUBING. LEAVE CABLE END NEAR OPENING OF TUBE.
 4. INSTALL SS LOCKING RING INTO GROOVE IN CONNECTOR LOCKING SLEEVE (ITEM 12), THEN SCREW ONTO BHD CONNECTOR (ITEM 3).



APPLY HEATSHRINK, STRIP INSULATION AND COIL CABLE PER NOTES



INSTALL GREASE FITTING
 (NOTE: TOP OF FITTING MUST BE WITHIN PART DIAMETER)



INSTALL BHD CONNECTOR



NEATLY WRAP, TWIST & TRIM SS WIRE, FOLD SHARP END INWARD

ITEM	REF DES	QTY	PART NUMBER	DESCRIPTION	REMARKS
PARTS LIST					
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCE ON			MATERIAL:		
FRAC.	DEC.	ANGLES	FINISH SPECS:		
TOL.	.XX ± .01	± TOL.	NOTE		
	.XXX ± .005		DATE		
SURFACES			DRAWN C. DUNDORF 6/19/01		
METRIC REFERENCE			CHECKED		
INCHES (mm) & IN (mm)			APPROVED		
UNLESS OTHERWISE SPECIFIED COMMERCIAL PUBLISHED TOLERANCES SHALL APPLY TO TUBING, BAR, PLATE, ETC. PARTS MUST FIT GAGES AND MEET SPECIFIED TOLERANCES.			BREAK ALL SHARP EDGES		
			DEBURR ALL HOLES		
KLEIN ASSOCIATES, INC.		HIGH RESOLUTION SONAR			
SALEM * NEW HAMPSHIRE * 03079		U.S.A * (603)893-6131			
ASSY DWG, BHD CONN & TUBE (3/4" ID), 8 PIN MICRO					
CODE IDENT NO.	SIZE	DRAWING NO.	REV		
52315	C	15102920	00		
DO NOT SCALE PRINT		SCALE	NTS	SHT 1 OF 1	

14102920
 USED ON

Item No.	Component Part No.	Rev. No.	Description	Qty.	Unit
-	14102919	01	assy, cable term, bhd conn, armored, coax, .40"		
1	13300043		cable, coax, armored, .40 OD	300	meter
2	14102920	04	assy, bhd conn & tubing (3/4" ID), 8 pin micro	1	ea.
3	14101714		assy, bail grip	1	ea.
4	14103031	00	assy, strain relief, .50 ID x 1.75" OD x 12.75"L, 1.25" hex, yellow	1	ea.
5	14201788	00	housing, cable term, bhd, 17"	1	ea.
6	14201828	00	sleeve 7/16", 1.50-12 thread, 1.25" hex	1	ea.
7	12500823		screw, fhms, m6 x 12mm, phlps, ss	2	ea.
8	16200023		pin, groove, .125 x 1", ss	2	ea.
9	14000210		dual plug, armored cable, 40 dia. nom.	1	ea.
10	-		intentionally left blank	-	-
11	14000273		clamp, hose, smooth band, .47" wide x 1.50-2.00 dia, 316ss	1	ea.
12	14000288		clamp, hose, .31" wide x .50-.91 dia, ss	1	ea.
13	14000284		clamp, hose, .31" wide x .69-1.25 dia, ss	1	ea.
14	14000292		SPLICE,INSUL,CRIMP,22-12AWG,CLOSED END	3	ea.
15	14000112		splice, non-ins, par crimp, .14 ID	2	ea.
16	12700536		wrap, spiral, 1/2 in, black	50	in
17	12700603		shrink sleeving, pvc, 2" (2:1), thin-wall (.048"thk), yellow, 3" long	1	ea.
18	-		intentionally left blank	-	-
19	-		intentionally left blank	-	-
20	-		intentionally left blank	-	-
21	-		intentionally left blank	-	-
22	12700510		tie, cable 7.5 x .185 in, black	5	ea.
23	12700029		cable ties, 4"	5	ea.
24	12700609		tubing, .25 ID x .50 OD, 50A duro, silicone, translucent	1	in
25	12700590		tubing, .50 ID x .75 OD, 50A duro, silicone, translucent	1	in
26	12700543		loctite, 277 (red), 10 ml btl	a/r	ea.
27	12700591		grease, lithium, Mobilith AW-2, NLGI 2, 3 oz cart.	1	ea.
28	13400046		adapter, flush grease fitting tip to 1/8 NPT female	1	ea.
29	13800032		bag, plastic, ziplock, 3x5	1	ea.
30	14000290		clamp, hose, worm, .50" wide x 1.06-2.00 dia, ss	1	ea.
31	12700558		bushing, anti-short, .350"	1	ea.
32	12700570		SLEEVIING,SHRNK,.8" X 9",3:1,THK,ADH,POLYOL	A/R	ea.
33	12700064		shrink sleeving, 3/8", black	A/R	in
34	12700149		SLEEVIING,SHRINK 1/4 IN BLACK	A/R	ea.
35	-		intentionally left blank	-	-
36	13500020		TERM,RING TONGUE #8 BLUE	2	ea.
37	17500006		msds, adhesive, loctite 277	0	ea.
38	17500013		msds, grease, lithium, Mobilith AW-2	0	ea.
39	17500008		msds, adhesive, loctite 242	0	ea.
40	12700021		ADHESIVE,LOCTITE #242, BLUE	a/r	ea.
41	14202032	00	COVER, CABLE TERMINATION HOUSING, 12"	1	ea.
42	14000295		CLAMP,HOSE, WORM, .31"WD X .22-.63DIA,SS	2	ea.
900	11210070	00	manual, cable term, bhd conn, armored, coax	0	ea.
901	14600193	01	outline dwg, cable term, bhd conn, armored, coax	0	ea.
902	15100963	03	assy dwg, cable term, bhd conn, armored, coax	0	ea.

Item No.	Component Part No.	Rev. No.	Description	Qty.	Unit
-	14102947	01	assy, cable term kit, bhd conn, armored, coax, .40		
1	13300043		cable, coax, armored, .40 OD	0	meter
2	14102920	04	assy, bhd conn & tubing (3/4" ID), 8 pin micro	1	ea.
3	14101714		assy, bail grip	1	ea.
4	14103031	00	assy, strain relief, .50 ID x 1.75" OD x 12.75"L, 1.25" hex, yellow	1	ea.
5	14201788	00	housing, cable term, bhd, 17"	1	ea.
6	14201828	00	sleeve 7/16", 1.50-12 thread, 1.25" hex	1	ea.
7	12500823		screw, fhms, m6 x 12mm, phlps, ss	2	ea.
8	16200023		pin, groove, .125 x 1", ss	4	ea.
9	14000210		dual plug, armored cable, 40 dia. nom.	1	ea.
10	-		intentionally left blank	-	-
11	14000273		clamp, hose, smooth band, .47" wide x 1.50-2.00 dia, 316ss	1	ea.
12	14000288		clamp, hose, .31" wide x .50-.91 dia, ss	1	ea.
13	14000284		clamp, hose, .31" wide x .69-1.25 dia, ss	1	ea.
14	14000292		SPLICE,INSUL,CRIMP,22-12AWG,CLOSED END	3	ea.
15	14000112		splice, non-ins, par crimp, .14 ID	3	ea.
16	12700536		wrap, spiral, 1/2 in, black	50	in
17	12700603		shrink sleeving, pvc, 2" (2:1), thin-wall (.048"thk), yellow, 3" long	1	ea.
18	-		intentionally left blank	-	-
19	-		intentionally left blank	-	-
20	-		intentionally left blank	-	-
21	-		intentionally left blank	-	-
22	12700510		tie, cable 7.5 x .185 in, black	20	ea.
23	12700029		cable ties, 4"	5	ea.
24	12700609		tubing, .25 ID x .50 OD, 50A duro, silicone, translucent	1	in
25	12700590		tubing, .50 ID x .75 OD, 50A duro, silicone, translucent	1	in
26	12700543		loctite, 277 (red), 10 ml btl	1	ea.
27	12700591		grease, lithium, Mobilith AW-2, NLGI 2, 3 oz cart.	1	ea.
28	13400046		adapter, flush grease fitting tip to 1/8 NPT female	1	ea.
29	13800032		bag, plastic, ziplock, 3x5	1	ea.
30	14000290		clamp, hose, worm, .50" wide x 1.06-2.00 dia, ss	1	ea.
31	12700558		bushing, anti-short, .350"	1	ea.
32	12700570		SLEEVIING,SHRNK,.8" X 9",3:1,THK,ADH,POLYOL	0	ea.
33	12700064		shrink sleeving, 3/8", black	1	in
34	12700149		SLEEVIING,SHRINK 1/4 IN BLACK	0	ea.
35	-		intentionally left blank	-	-
36	13500020		TERM,RING TONGUE #8 BLUE	0	ea.
37	17500006		msds, adhesive, loctite 277	1	ea.
38	17500013		msds, grease, lithium, Mobilith AW-2	1	ea.
39	17500008		msds, adhesive, loctite 242	1	ea.
40	12700021		ADHESIVE,LOCTITE #242, BLUE	1	ea.
41	14202032	00	COVER, CABLE TERMINATION HOUSING, 12"	1	ea.
42	14000295		CLAMP,HOSE, WORM, .31"WD X .22-.63DIA,SS	1	ea.
900	11210070	00	manual, cable term, bhd conn, armored, coax	1	ea.
901	14600193	01	outline dwg, cable term, bhd conn, armored, coax	1	ea.
902	15100963	03	assy dwg, cable term, bhd conn, armored, coax	1	ea.

Item No.	Component Part No.	Rev. No.	Description	Qty.	Unit
-	14103049	01	assy, cable repl kit, bhd conn, armored, coax, .40		
1	13300043		cable, coax, armored, .40 OD	0	meter
2	14102920	04	assy, bhd conn & tubing (3/4" ID), 8 pin micro	0	ea.
3	14101714		assy, bail grip	0	ea.
4	14103031	00	assy, strain relief, .50 ID x 1.75" OD x 12.75"L, 1.25" hex, yellow	0	ea.
5	14201788	00	housing, cable term, bhd, 17"	0	ea.
6	14201828	00	sleeve 7/16", 1.50-12 thread, 1.25" hex	1	ea.
7	12500823		screw, fhms, m6 x 12mm, phlps, ss	2	ea.
8	16200023		pin, groove, .125 x 1", ss	4	ea.
9	14000210		dual plug, armored cable, 40 dia. nom.	1	ea.
10	-		intentionally left blank	-	-
11	14000273		clamp, hose, smooth band, .47" wide x 1.50-2.00 dia, 316ss	1	ea.
12	14000288		clamp, hose, .31" wide x .50-.91 dia, ss	1	ea.
13	14000284		clamp, hose, .31" wide x .69-1.25 dia, ss	1	ea.
14	14000292		SPLICE,INSUL,CRIMP,22-12AWG,CLOSED END	3	ea.
15	14000112		splice, non-ins, par crimp, .14 ID	3	ea.
16	12700536		wrap, spiral, 1/2 in, black	50	in
17	12700603		shrink sleeving, pvc, 2" (2:1), thin-wall (.048"thk), yellow, 3" long	2	ea.
18	-		intentionally left blank	-	-
19	-		intentionally left blank	-	-
20	-		intentionally left blank	-	-
21	-		intentionally left blank	-	-
22	12700510		tie, cable 7.5 x .185 in, black	20	ea.
23	12700029		cable ties, 4"	5	ea.
24	12700609		tubing, .25 ID x .50 OD, 50A duro, silicone, translucent	2	in
25	12700590		tubing, .50 ID x .75 OD, 50A duro, silicone, translucent	2	in
26	12700543		loctite, 277 (red), 10 ml btl	1	ea.
27	12700591		grease, lithium, Mobilith AW-2, NLGI 2, 3 oz cart.	1	ea.
28	13400046		adapter, flush grease fitting tip to 1/8 NPT female	1	ea.
29	13800032		bag, plastic, ziplock, 3x5	0	ea.
30	14000290		clamp, hose, worm, .50" wide x 1.06-2.00 dia, ss	0	ea.
31	12700558		bushing, anti-short, .350"	0	ea.
32	12700570		SLEEVIING,SHRNK,.8" X 9",3:1,THK,ADH,POLYOL	0	ea.
33	12700064		shrink sleeving, 3/8", black	0	in
34	12700149		SLEEVIING,SHRINK 1/4 IN BLACK	0	ea.
35	-		intentionally left blank	-	-
36	13500020		TERM,RING TONGUE #8 BLUE	0	ea.
37	17500006		msds, adhesive, loctite 277	1	ea.
38	17500013		msds, grease, lithium, Mobilith AW-2	1	ea.
39	17500008		msds, adhesive, loctite 242	1	ea.
40	12700021		ADHESIVE,LOCTITE #242, BLUE	1	ea.
41	14202032	00	COVER, CABLE TERMINATION HOUSING, 12"	0	ea.
42	14000295		CLAMP,HOSE, WORM, .31"WD X .22-.63DIA,SS	1	ea.
900	11210070	00	manual, cable term, bhd conn, armored, coax	1	ea.
901	14600193	01	outline dwg, cable term, bhd conn, armored, coax	1	ea.
902	15100963	03	assy dwg, cable term, bhd conn, armored, coax	1	ea.

Item No.	Component Part No.	Rev. No.	Description	Qty.	Unit
-	14103046	01	assy, cable term kit, bhd conn, armored, coax, .45"		
1	13300042		cable, coax, armored, .45 OD	0	meter
2	14102920	04	assy, bhd conn & tubing (3/4" ID), 8 pin micro	1	ea.
3	14101714		assy, bail grip	1	ea.
4	14102978	00	assy, strain relief, .62 ID x 1.75" OD x 12.75", 1.25" hex, yellow	1	ea.
5	14201788	00	housing, cable term, bhd, 17"	1	ea.
6	14201850	00	sleeve 1/2", 1.50-12 thread, 1.25" hex	1	ea.
7	12500823		screw, fhms, m6 x 12mm, phlps, ss	2	ea.
8	16200023		pin, groove, .125 x 1", ss	4	ea.
9	14000205		dual plug, .450 dia. armored coax towcable	1	ea.
10	-		intentionally left blank	-	-
11	14000273		clamp, hose, smooth band, .47" wide x 1.50-2.00 dia, 316ss	1	ea.
12	14000288		clamp, hose, .31" wide x .50-.91 dia, ss	1	ea.
13	14000284		clamp, hose, .31" wide x .69-1.25 dia, ss	1	ea.
14	14000292		SPLICE,INSUL,CRIMP,22-12AWG,CLOSED END	3	ea.
15	14000112		splice, non-ins, par crimp, .14 ID	2	ea.
16	12700536		wrap, spiral, 1/2 in, black	50	in
17	12700603		shrink sleeving, pvc, 2" (2:1), thin-wall (.048"thk), yellow, 3" long	1	ea.
18	-		intentionally left blank	-	-
19	-		intentionally left blank	-	-
20	-		intentionally left blank	-	-
21	-		intentionally left blank	-	-
22	12700510		tie, cable 7.5 x .185 in, black	20	ea.
23	12700029		cable ties, 4"	5	ea.
24	12700609		tubing, .25 ID x .50 OD, 50A duro, silicone, translucent	1	in
25	12700590		tubing, .50 ID x .75 OD, 50A duro, silicone, translucent	1	in
26	12700543		loctite, 277 (red), 10 ml btl	1	ea.
27	12700591		grease, lithium, Mobilith AW-2, NLGI 2, 3 oz cart.	1	ea.
28	13400046		adapter, flush grease fitting tip to 1/8 NPT female	1	ea.
29	13800032		bag, plastic, ziplock, 3x5	1	ea.
30	14000290		clamp, hose, worm, .50" wide x 1.06-2.00 dia, ss	1	ea.
31	12700558		bushing, anti-short, .350"	1	ea.
32	12700570		SLEEVIING,SHRNK,.8" X 9",3:1,THK,ADH,POLYOL	0	ea.
33	12700002		SLEEVIING,SHRINK 1/2 IN BLACK	0	in
34	12700149		SLEEVIING,SHRINK 1/4 IN BLACK	0	in
35	-		intentionally left blank	-	-
36	13500020		TERM,RING TONGUE #8 BLUE	0	ea.
37	17500006		msds, adhesive, loctite 277	1	ea.
38	17500013		msds, grease, lithium, Mobilith AW-2	1	ea.
39	17500008		msds, adhesive, loctite 242	1	ea.
40	12700021		ADHESIVE,LOCTITE #242, BLUE	1	ea.
41	14202032	00	COVER, CABLE TERMINATION HOUSING, 12"	1	ea.
42	14000295		CLAMP,HOSE, WORM, .31"WD X .22-.63DIA,SS	1	ea.
900	11210070	00	manual, cable term, bhd conn, armored, coax	1	ea.
901	14600193	01	outline dwg, cable term, bhd conn, armored, coax	1	ea.
902	15100963	03	assy dwg, cable term, bhd conn, armored, coax	1	ea.

Item No.	Component Part No.	Rev. No.	Description	Qty.	Unit
-	14103093	01	assy, cable term repl kit, bhd conn, armored, coax, .45"		
1	13300042		cable, coax, armored, .45 OD	0	meter
2	14102920	04	assy, bhd conn & tubing (3/4" ID), 8 pin micro	0	ea.
3	14101714		assy, bail grip	0	ea.
4	14102978	00	assy, strain relief, .62 ID x 1.75" OD x 12.75", 1.25" hex, yellow	0	ea.
5	14201788	00	housing, cable term, bhd, 17"	0	ea.
6	14201850	00	sleeve 1/2", 1.50-12 thread, 1.25" hex	1	ea.
7	12500823		screw, fhms, m6 x 12mm, phlps, ss	2	ea.
8	16200023		pin, groove, .125 x 1", ss	4	ea.
9	14000205		dual plug, .450 dia. armored coax towcable	1	ea.
10	-		intentionally left blank	-	-
11	14000273		clamp, hose, smooth band, .47" wide x 1.50-2.00 dia, 316ss	1	ea.
12	14000288		clamp, hose, .31" wide x .50-.91 dia, ss	1	ea.
13	14000284		clamp, hose, .31" wide x .69-1.25 dia, ss	1	ea.
14	14000292		SPLICE,INSUL,CRIMP,22-12AWG,CLOSED END	3	ea.
15	14000112		splice, non-ins, par crimp, .14 ID	3	ea.
16	12700536		wrap, spiral, 1/2 in, black	50	in
17	12700603		shrink sleeving, pvc, 2" (2:1), thin-wall (.048"thk), yellow, 3" long	2	ea.
18	-		intentionally left blank	-	-
19	-		intentionally left blank	-	-
20	-		intentionally left blank	-	-
21	-		intentionally left blank	-	-
22	12700510		tie, cable 7.5 x .185 in, black	20	ea.
23	12700029		cable ties, 4"	5	ea.
24	12700609		tubing, .25 ID x .50 OD, 50A duro, silicone, translucent	2	in
25	12700590		tubing, .50 ID x .75 OD, 50A duro, silicone, translucent	2	in
26	12700543		loctite, 277 (red), 10 ml btl	1	ea.
27	12700591		grease, lithium, Mobilith AW-2, NLGI 2, 3 oz cart.	1	ea.
28	13400046		adapter, flush grease fitting tip to 1/8 NPT female	1	ea.
29	13800032		bag, plastic, ziplock, 3x5	0	ea.
30	14000290		clamp, hose, worm, .50" wide x 1.06-2.00 dia, ss	0	ea.
31	12700558		bushing, anti-short, .350"	0	ea.
32	12700570		SLEEVING,SHRNK,.8" X 9",3:1,THK,ADH,POLYOL	0	ea.
33	12700002		SLEEVING,SHRINK 1/2 IN BLACK	0	in
34	12700149		SLEEVING,SHRINK 1/4 IN BLACK	0	in
35	-		intentionally left blank	-	-
36	13500020		TERM,RING TONGUE #8 BLUE	0	ea.
37	17500006		msds, adhesive, loctite 277	1	ea.
38	17500013		msds, grease, lithium, Mobilith AW-2	1	ea.
39	17500008		msds, adhesive, loctite 242	1	ea.
40	12700021		ADHESIVE,LOCTITE #242, BLUE	1	ea.
41	14202032	00	COVER, CABLE TERMINATION HOUSING, 12"	0	ea.
42	14000295		CLAMP,HOSE, WORM, .31"WD X .22-.63DIA,SS	1	ea.
900	11210070	00	manual, cable term, bhd conn, armored, coax	1	ea.
901	14600193	01	outline dwg, cable term, bhd conn, armored, coax	1	ea.
902	15100963	03	assy dwg, cable term, bhd conn, armored, coax	1	ea.

Item No.	Component Part No.	Rev. No.	Description	Qty.	Unit
-	14103091	01	assy, cable term kit, bhd conn, armored, coax, .499"		
1	13300072		cable, coax, armored, .499 OD	0	meter
2	14102920	04	assy, bhd conn & tubing (3/4" ID), 8 pin micro	1	ea.
3	14101714		assy, bail grip	1	ea.
4	14102978	00	assy, strain relief, .62 ID x 1.75" OD x 12.75", 1.25" hex, yellow	1	ea.
5	14201788	00	housing, cable term, bhd, 17"	1	ea.
6	14201850	00	sleeve 1/2", 1.50-12 thread, 1.25" hex	1	ea.
7	12500823		screw, fhms, m6 x 12mm, phlps, ss	2	ea.
8	16200023		pin, groove, .125 x 1", ss	4	ea.
9	14000211		dual plug, 243A, 245B, 250C, .450 dia. coax arm towcable	1	ea.
10	-		intentionally left blank	-	-
11	14000273		clamp, hose, smooth band, .47" wide x 1.50-2.00 dia, 316ss	1	ea.
12	14000288		clamp, hose, .31" wide x .50-.91 dia, ss	1	ea.
13	14000284		clamp, hose, .31" wide x .69-1.25 dia, ss	1	ea.
14	14000292		SPLICE,INSUL,CRIMP,22-12AWG,CLOSED END	3	ea.
15	14000112		splice, non-ins, par crimp, .14 ID	2	ea.
16	12700536		wrap, spiral, 1/2 in, black	50	in
17	12700603		shrink sleeving, pvc, 2" (2:1), thin-wall (.048"thk), yellow, 3" long	1	ea.
18	-		intentionally left blank	-	-
19	-		intentionally left blank	-	-
20	-		intentionally left blank	-	-
21	-		intentionally left blank	-	-
22	12700510		tie, cable 7.5 x .185 in, black	20	ea.
23	12700029		cable ties, 4"	5	ea.
24	12700609		tubing, .25 ID x .50 OD, 50A duro, silicone, translucent	1	in
25	12700590		tubing, .50 ID x .75 OD, 50A duro, silicone, translucent	1	in
26	12700543		loctite, 277 (red), 10 ml btl	1	ea.
27	12700591		grease, lithium, Mobilith AW-2, NLGI 2, 3 oz cart.	1	ea.
28	13400046		adapter, flush grease fitting tip to 1/8 NPT female	1	ea.
29	13800032		bag, plastic, ziplock, 3x5	1	ea.
30	14000290		clamp, hose, worm, .50" wide x 1.06-2.00 dia, ss	1	ea.
31	12700558		bushing, anti-short, .350"	1	ea.
32	12700570		SLEEVING,SHRNK,.8" X 9",3:1,THK,ADH,POLYOL	0	ea.
33	12700002		SLEEVING,SHRINK 1/2 IN BLACK	0	in
34	12700149		SLEEVING,SHRINK 1/4 IN BLACK	0	in
35	-		intentionally left blank	-	-
36	13500020		TERM,RING TONGUE #8 BLUE	2	ea.
37	17500006		msds, adhesive, loctite 277	0	ea.
38	17500013		msds, grease, lithium, Mobilith AW-2	0	ea.
39	17500008		msds, adhesive, loctite 242	1	ea.
40	12700021		ADHESIVE,LOCTITE #242, BLUE	1	ea.
41	14202032	00	COVER, CABLE TERMINATION HOUSING, 12"	1	ea.
42	14000295		CLAMP,HOSE, WORM, .31"WD X .22-.63DIA,SS	1	ea.
900	11210070	00	manual, cable term, bhd conn, armored, coax	1	ea.
901	14600193	01	outline dwg, cable term, bhd conn, armored, coax	1	ea.
902	15100963	03	assy dwg, cable term, bhd conn, armored, coax	1	ea.

Item No.	Component Part No.	Rev. No.	Description	Qty.	Unit
-	14103092	01	assy, cable term repl kit, bhd conn, armored, coax, .499"		
1	13300072		cable, coax, armored, .499 OD	0	meter
2	14102920	04	assy, bhd conn & tubing (3/4" ID), 8 pin micro	0	ea.
3	14101714		assy, bail grip	0	ea.
4	14102978	00	assy, strain relief, .62 ID x 1.75" OD x 12.75", 1.25" hex, yellow	0	ea.
5	14201788	00	housing, cable term, bhd, 17"	0	ea.
6	14201850	X00	sleeve 1/2", 1.50-12 thread, 1.25" hex	1	ea.
7	12500823		screw, fhms, m6 x 12mm, phlps, ss	2	ea.
8	16200023		pin, groove, .125 x 1", ss	4	ea.
9	14000211		dual plug, 243A, 245B, 250C, .450 dia. coax arm towcable	1	ea.
10	-		intentionally left blank	-	-
11	14000273		clamp, hose, smooth band, .47" wide x 1.50-2.00 dia, 316ss	1	ea.
12	14000288		clamp, hose, .31" wide x .50-.91 dia, ss	1	ea.
13	14000284		clamp, hose, .31" wide x .69-1.25 dia, ss	1	ea.
14	14000292		SPLICE,INSUL,CRIMP,22-12AWG,CLOSED END	3	ea.
15	14000112		splice, non-ins, par crimp, .14 ID	3	ea.
16	12700536		wrap, spiral, 1/2 in, black	50	in
17	12700603		shrink sleeving, pvc, 2" (2:1), thin-wall (.048"thk), yellow, 3" long	2	ea.
18	-		intentionally left blank	-	-
19	-		intentionally left blank	-	-
20	-		intentionally left blank	-	-
21	-		intentionally left blank	-	-
22	12700510		tie, cable 7.5 x .185 in, black	20	ea.
23	12700029		cable ties, 4"	5	ea.
24	12700609		tubing, .25 ID x .50 OD, 50A duro, silicone, translucent	2	in
25	12700590		tubing, .50 ID x .75 OD, 50A duro, silicone, translucent	2	in
26	12700543		loctite, 277 (red), 10 ml btl	1	ea.
27	12700591		grease, lithium, Mobilith AW-2, NLGI 2, 3 oz cart.	1	ea.
28	13400046		adapter, flush grease fitting tip to 1/8 NPT female	1	ea.
29	13800032		bag, plastic, ziplock, 3x5	0	ea.
30	14000290		clamp, hose, worm, .50" wide x 1.06-2.00 dia, ss	0	ea.
31	12700558		bushing, anti-short, .350"	0	ea.
32	12700570		SLEEVING,SHRNK,.8" X 9",3:1,THK,ADH,POLYOL	0	ea.
33	12700002		SLEEVING,SHRINK 1/2 IN BLACK	0	in
34	12700149		SLEEVING,SHRINK 1/4 IN BLACK	0	in
35	-		intentionally left blank	-	-
36	13500020		TERM,RING TONGUE #8 BLUE	0	ea.
37	17500006		msds, adhesive, loctite 277	1	ea.
38	17500013		msds, grease, lithium, Mobilith AW-2	1	ea.
39	17500008		msds, adhesive, loctite 242	1	ea.
40	12700021		ADHESIVE,LOCTITE #242, BLUE	1	ea.
41	14202032	00	COVER, CABLE TERMINATION HOUSING, 12"	0	ea.
42	14000295		CLAMP,HOSE, WORM, .31"WD X .22-.63DIA,SS	1	ea.
900	11210070	00	manual, cable term, bhd conn, armored, coax	1	ea.
901	14600193	01	outline dwg, cable term, bhd conn, armored, coax	1	ea.
902	15100963	03	assy dwg, cable term, bhd conn, armored, coax	1	ea.

Item No.	Component Part No.	Rev. No.	Description	Qty.	Unit
-	14102967	04	assy, cable term, bhd conn, armored, coax, .525		
1	13300067	00	cable, coax, armored, ss, .525 OD	400	met
2	14102920	04	assy, bhd conn & tubing (3/4" ID), 8 pin micro	1	ea.
3	14101714	00	assy, bail grip	1	ea.
4	14102978	00	assy, strain relief, .62 ID x 1.75" OD x 12.75", 1.25" hex, yellow	1	ea.
5	14201788	00	housing, cable term, bhd, 17"	1	ea.
6	14201813	00	sleeve 9/16", 1.50 x 12 thread, 1.25" hex	1	ea.
7	12500823		screw, fhms, m6 x 12mm, phlps, ss	2	ea.
8	16200023		pin, groove, .125 x 1", ss	2	ea.
9	14000275		dual plug, armored cable, coax, .525"	1	ea.
10	-		intentionally left blank	-	-
11	14000273		clamp, hose, smooth band, .47" wide x 1.50-2.00 dia, 316ss	1	ea.
12	14000288		clamp, hose, .31" wide x .50-.91 dia, ss	1	ea.
13	14000284		clamp, hose, .31" wide x .69-1.25 dia, ss	1	ea.
14	14000292		SPLICE,INSUL,CRIMP,22-12AWG,CLOSED END	1	ea.
15	14000261		splice, non-ins, par crimp, copper, .21ID	1	ea.
16	12700536		wrap, spiral, 1/2 in, black	50	in
17	12700603		shrink sleeving, pvc, 2" (2:1), .048" thk, yellow, 3" long	1	ea.
18	-		intentionally left blank	-	-
19	-		intentionally left blank	-	-
20	-		intentionally left blank	-	-
21	-		intentionally left blank	-	-
22	12700510		tie, cable 7.5 x .185 in, black	a/r	ea.
23	12700029		cable ties, 4"	a/r	ea.
24	12700589		tubing, .31 ID x .50 OD, 54A duro, silicone, translucent	1	in
25	12700590		tubing, .50 ID x .75 OD, 50A duro, silicone, translucent	1	in
26	12700543		loctite, 277 (red), 10 ml btl	a/r	ea.
27	12700591		grease, lithium, Mobilith AW-2, NLGI 2, 3 oz cart.	1	ea.
28	13400046		adapter, flush grease fitting tip to 1/8 NPT female	1	ea.
29	13800032		bag, plastic, ziplock, 3x5	1	ea.
30	14000290		clamp, hose, worm, .50" wide x 1.06-2.00 dia, ss	1	ea.
31	12700558		bushing, anti-short, .350"	1	ea.
32	12700570		SLEEVING,SHRNK,.8" X 9",3:1,THK,ADH,POLYOL	A/R	ea.
33	12700002		SLEEVING,SHRINK 1/2 IN BLACK	A/R	in
34	12700149		SLEEVING,SHRINK 1/4 IN BLACK	A/R	in
35	-		intentionally left blank	-	-
36	13500020		TERM,RING TONGUE #8 BLUE	2	ea.
37	17500006		msds, adhesive, loctite 277	0	ea.
38	17500013		msds, grease, lithium, Mobilith AW-2	0	ea.
39	17500008		msds, adhesive, loctite 242	0	ea.
40	12700021		ADHESIVE,LOCTITE #242, BLUE	a/r	ea.
41	14202032	00	COVER, CABLE TERMINATION HOUSING, 12"	1	ea.
42	14000295		CLAMP,HOSE, WORM, .31"WD X .22-.63DIA,SS	2	ea.
900	11210070	00	manual, cable term, bhd conn, armored, coax	0	ea.
901	14600193	01	outline dwg, cable term, bhd conn, armored, coax	0	ea.
902	15100963	03	assy dwg, cable term, bhd conn, armored, coax	0	ea.

Item No.	Component Part No.	Rev. No.	Description	Qty.	Unit
-	14102965	04	assy, cable term kit, bhd conn, armored, coax, .525		
1	13300067	00	cable, coax, armored, ss, .525 OD	0	met
2	14102920	04	assy, bhd conn & tubing (3/4" ID), 8 pin micro	1	ea.
3	14101714	00	assy, bail grip	1	ea.
4	14102978	00	assy, strain relief, .62 ID x 1.75" OD x 12.75", 1.25" hex, yellow	1	ea.
5	14201788	00	housing, cable term, bhd, 17"	1	ea.
6	14201813	00	sleeve 9/16", 1.50 x 12 thread, 1.25" hex	1	ea.
7	12500823		screw, fhms, m6 x 12mm, phlps, ss	2	ea.
8	16200023		pin, groove, .125 x 1", ss	4	ea.
9	14000275		dual plug, armored cable, coax, .525"	1	ea.
10	-		intentionally left blank	-	-
11	14000273		clamp, hose, smooth band, .47" wide x 1.50-2.00 dia, 316ss	1	ea.
12	14000288		clamp, hose, .31" wide x .50-.91 dia, ss	1	ea.
13	14000284		clamp, hose, .31" wide x .69-1.25 dia, ss	1	ea.
14	14000292		SPLICE,INSUL,CRIMP,22-12AWG,CLOSED END	3	ea.
15	14000261		splice, non-ins, par crimp, copper, .21ID	3	ea.
16	12700536		wrap, spiral, 1/2 in, black	50	in
17	12700603		shrink sleeving, pvc, 2" (2:1), .048" thk, yellow, 3" long	2	ea.
18	-		intentionally left blank	-	-
19	-		intentionally left blank	-	-
20	-		intentionally left blank	-	-
21	-		intentionally left blank	-	-
22	12700510		tie, cable 7.5 x .185 in, black	20	ea.
23	12700029		cable ties, 4"	5	ea.
24	12700589		tubing, .31 ID x .50 OD, 54A duro, silicone, translucent	2	in
25	12700590		tubing, .50 ID x .75 OD, 50A duro, silicone, translucent	2	in
26	12700543		loctite, 277 (red), 10 ml btl	1	ea.
27	12700591		grease, lithium, Mobilith AW-2, NLGI 2, 3 oz cart.	1	ea.
28	13400046		adapter, flush grease fitting tip to 1/8 NPT female	1	ea.
29	13800032		bag, plastic, ziplock, 3x5	1	ea.
30	14000290		clamp, hose, worm, .50" wide x 1.06-2.00 dia, ss	0	ea.
31	12700558		bushing, anti-short, .350"	0	ea.
32	12700570		SLEEVING,SHRNK,.8" X 9",3:1,THK,ADH,POLYOL	0	ea.
33	12700002		SLEEVING,SHRINK 1/2 IN BLACK	0	in
34	12700149		SLEEVING,SHRINK 1/4 IN BLACK	0	in
35	-		intentionally left blank	-	-
36	13500020		TERM,RING TONGUE #8 BLUE	0	ea.
37	17500006		msds, adhesive, loctite 277	1	ea.
38	17500013		msds, grease, lithium, Mobilith AW-2	1	ea.
39	17500008		msds, adhesive, loctite 242	1	ea.
40	12700541		ADHESIVE,LOC 242(BLUE) .5ML CPSL	1	ea.
41	14202032	00	COVER, CABLE TERMINATION HOUSING, 12"	1	ea.
42	14000295		CLAMP,HOSE, WORM, .31"WD X .22-.63DIA,SS	1	ea.
900	11210070	00	manual, cable term, bhd conn, armored, coax	1	ea.
901	14600193	01	outline dwg, cable term, bhd conn, armored, coax	1	ea.
902	15100963	03	assy dwg, cable term, bhd conn, armored, coax	1	ea.

Item No.	Component Part No.	Rev. No.	Description	Qty.	Unit
-	14102979	04	assy, cable term repl kit, bhd conn, armored, coax, .525		
1	13300067	00	cable, coax, armored, ss, .525 OD	0	met
2	14102920	04	assy, bhd conn & tubing (3/4" ID), 8 pin micro	0	ea.
3	14101714	00	assy, bail grip	0	ea.
4	14102978	00	assy, strain relief, .62 ID x 1.75" OD x 12.75", 1.25" hex, yellow	0	ea.
5	14201788	00	housing, cable term, bhd, 17"	0	ea.
6	14201813	00	sleeve 9/16", 1.50 x 12 thread, 1.25" hex	1	ea.
7	12500823		screw, fhms, m6 x 12mm, phlps, ss	2	ea.
8	16200023		pin, groove, .125 x 1", ss	4	ea.
9	14000275		dual plug, armored cable, coax, .525"	1	ea.
10	-		intentionally left blank	-	-
11	14000273		clamp, hose, smooth band, .47" wide x 1.50-2.00 dia, 316ss	1	ea.
12	14000288		clamp, hose, .31" wide x .50-.91 dia, ss	1	ea.
13	14000284		clamp, hose, .31" wide x .69-1.25 dia, ss	1	ea.
14	14000292		SPLICE,INSUL,CRIMP,22-12AWG,CLOSED END	3	ea.
15	14000261		splice, non-ins, par crimp, copper, .21ID	3	ea.
16	12700536		wrap, spiral, 1/2 in, black	50	in
17	12700603		shrink sleeving, pvc, 2" (2:1), .048" thk, yellow, 3" long	2	ea.
18	-		intentionally left blank	-	-
19	-		intentionally left blank	-	-
20	-		intentionally left blank	-	-
21	-		intentionally left blank	-	-
22	12700510		tie, cable 7.5 x .185 in, black	5	ea.
23	12700029		cable ties, 4"	20	ea.
24	12700589		tubing, .31 ID x .50 OD, 54A duro, silicone, translucent	2	in
25	12700590		tubing, .50 ID x .75 OD, 50A duro, silicone, translucent	2	in
26	12700543		loctite, 277 (red), 10 ml btl	1	ea.
27	12700591		grease, lithium, Mobilith AW-2, NLGI 2, 3 oz cart.	1	ea.
28	13400046		adapter, flush grease fitting tip to 1/8 NPT female	1	ea.
29	13800032		bag, plastic, ziplock, 3x5	1	ea.
30	14000290		clamp, hose, worm, .50" wide x 1.06-2.00 dia, ss	0	ea.
31	12700558		bushing, anti-short, .350"	0	ea.
32	12700570		SLEEVING,SHRINK,.8" X 9",3:1,THK,ADH,POLYOL	0	ea.
33	12700002		SLEEVING,SHRINK 1/2 IN BLACK	0	in
34	12700149		SLEEVING,SHRINK 1/4 IN BLACK	0	in
35	-		intentionally left blank	-	-
36	13500020		TERM,RING TONGUE #8 BLUE	0	ea.
37	17500006		msds, adhesive, loctite 277	1	ea.
38	17500013		msds, grease, lithium, Mobilith AW-2	1	ea.
39	17500008		msds, adhesive, loctite 242	1	ea.
40	12700541		ADHESIVE,LOC 242(BLUE) .5ML CPSL	1	ea.
41	14202032	00	COVER, CABLE TERMINATION HOUSING, 12"	0	ea.
42	14000295		CLAMP,HOSE, WORM, .31"WD X .22-.63DIA,SS	1	ea.
900	11210070	00	manual, cable term, bhd conn, armored, coax	1	ea.
901	14600193	01	outline dwg, cable term, bhd conn, armored, coax	1	ea.
902	15100963	03	assy dwg, cable term, bhd conn, armored, coax	1	ea.

Item No.	Component Part No.	Rev. No.	Description	Qty.	Unit
-	14103017	01	assy, cable term, bhd conn, armored, coax, .68		
1	13300045	-	cable, coax, armored, ss, .68 OD		met.
2	14102920	04	assy, bhd conn & tubing (3/4" ID), 8 pin micro	1	ea.
3	14102771		assy, grip bail, mod .56 to .75 range	1	ea.
4	14103024	00	assy, strain relief, .75 ID x 2.50" OD x 18" (3/4" sleeve,140-223), ylw	1	ea.
5	14201788	00	housing, cable term, bhd, 17"	1	ea.
6	14000223		sleeve, .680 arm cable	1	ea.
7	12500823		screw, fhms, m6 x 12mm, phlps, ss	2	ea.
8	16200023		pin, groove, .125 x 1", ss	2	ea.
9	14000222		dual plug, armored cable, .68 cable	1	ea.
10	-		intentionally left blank	-	-
11	14000291		clamp, hose, smooth band, .47" wide x 1.75-2.75 dia, 316ss	1	ea.
12	14000288		clamp, hose, .31" wide x .50-.91 dia, ss	1	ea.
13	14000284		clamp, hose, .31" wide x .69-1.25 dia, ss	1	ea.
14	14000293		SPLICE,INSUL,CRIMP,8AWG,CLOSED END	1	ea.
15	14000261		splice, non-ins, par crimp, copper, .21ID	1	ea.
16	12700536		wrap, spiral, 1/2 in, black	50	in
17	12700615		shrink sleeving, pvc, 3" (2:1), standard-wall thk, yellow, 3" long	1	ea.
18	-		intentionally left blank	-	-
19	-		intentionally left blank	-	-
20	-		intentionally left blank	-	-
21	-		intentionally left blank	-	-
22	12700510		tie, cable 7.5 x .185 in, black	20	ea.
23	12700029		cable ties, 4"	5	ea.
24	12700612		tubing, .43 ID x .62 OD, 50A duro, silicone, translucent	1	in
25	12700613		tubing, .62 ID x .75 OD, 50A duro, silicone, translucent	1	in
26	12700543		loctite, 277 (red), 10 ml btl	a/r	ea.
27	12700591		grease, lithium, Mobilith AW-2, NLGI 2, 3 oz cart.	1	ea.
28	13400046		adapter, flush grease fitting tip to 1/8 NPT female	1	ea.
29	13800032		bag, plastic, ziplock, 3x5	1	ea.
30	14000290		clamp, hose, worm, .50" wide x 1.06-2.00 dia, ss	1	ea.
31	12700614		bushing, anti-short, .540" ID, hi-dielectric plastic	1	ea.
32	12700570		SLEEVING,SHRINK,.8" X 9",3:1,THK,ADH,POLYOL	A/R	ea.
33	12700002		SLEEVING,SHRINK 1/2 IN BLACK	A/R	in
34	12700149		SLEEVING,SHRINK 1/4 IN BLACK	A/R	in
35	-		intentionally left blank	-	-
36	13500113		TERMINAL,RING #10 YELLOW	2	ea.
37	17500006		msds, adhesive, loctite 277	0	ea.
38	17500013		msds, grease, lithium, Mobilith AW-2	0	ea.
39	17500008		msds, adhesive, loctite 242	0	ea.
40	12700541		ADHESIVE,LOC 242(BLUE) .5ML CPSL	a/r	ea.
41	14202032	00	COVER, CABLE TERMINATION HOUSING, 12"	1	ea.
42	14000296		CLAMP,HOSE, WORM, .31"WD X .44-.78DIA,SS	2	
900	11210070	00	manual, cable term, bhd conn, armored, coax	0	ea.
901	14600209	01	outline dwg, cable term, bhd conn, armored, coax	0	ea.
902	15101000	01	assy dwg, cable term, bhd conn, armored, coax	0	ea.

Item No.	Component Part No.	Rev. No.	Description	Qty.	Unit
-	14103037	03	assy, cable term kit, bhd conn, armored, coax, .68		
1	13300045	-	cable, coax, armored, ss, .68 OD	0	met.
2	14102920	04	assy, bhd conn & tubing (3/4" ID), 8 pin micro	1	ea.
3	14102771		assy, grip bail, mod .56 to .75 range	1	ea.
4	14103024	00	assy, strain relief, .75 ID x 2.50" OD x 18" (3/4" sleeve,140-223), yellow	1	ea.
5	14201788	00	housing, cable term, bhd, 17"	1	ea.
6	14000223		sleeve, .680 arm cable	1	ea.
7	12500823		screw, fhms, m6 x 12mm, phlps, ss	2	ea.
8	16200023		pin, groove, .125 x 1", ss	4	ea.
9	14000222		dual plug, armored cable, .68 cable	1	ea.
10	-		intentionally left blank	-	-
11	14000291		clamp, hose, smooth band, .47" wide x 1.75-2.75 dia, 316ss	1	ea.
12	14000288		clamp, hose, .31" wide x .50-.91 dia, ss	1	ea.
13	14000284		clamp, hose, .31" wide x .69-1.25 dia, ss	1	ea.
14	14000293		SPLICE,INSUL,CRIMP,8AWG,CLOSED END	3	-
15	14000261		splice, non-ins, par crimp, copper, .21ID	3	ea.
16	12700536		wrap, spiral, 1/2 in, black	50	in
17	12700615		shrink sleeving, pvc, 3" (2:1), standard-wall thk, yellow, 3" long	1	ea.
18	-		intentionally left blank	-	-
19	-		intentionally left blank	-	-
20	-		intentionally left blank	-	ea.
21	-		intentionally left blank	-	in
22	12700510		tie, cable 7.5 x .185 in, black	20	ea.
23	12700029		cable ties, 4"	5	ea.
24	12700612		tubing, .43 ID x .62 OD, 50A duro, silicone, translucent	1	in
25	12700613		tubing, .62 ID x .75 OD, 50A duro, silicone, translucent	1	in
26	12700543		loctite, 277 (red), 10 ml btl	1	ea.
27	12700591		grease, lithium, Mobilith AW-2, NLGI 2, 3 oz cart.	1	ea.
28	13400046		adapter, flush grease fitting tip to 1/8 NPT female	1	ea.
29	13800032		bag, plastic, ziplock, 3x5	1	ea.
30	14000290		clamp, hose, worm, .50" wide x 1.06-2.00 dia, ss	1	ea.
31	12700614		bushing, anti-short, .540" ID, hi-dielectric plastic	1	ea.
32	12700570		SLEEVIING,SHRNK,.8" X 9",3:1,THK,ADH,POLYOL	1	ea.
33	12700002		SLEEVIING,SHRINK 1/2 IN BLACK	0	in
34	12700149		SLEEVIING,SHRINK 1/4 IN BLACK	0	in
35	-		intentionally left blank	-	-
36	13500113		TERMINAL,RING #10 YELLOW	0	ea.
37	17500006		msds, adhesive, loctite 277	1	ea.
38	17500013		msds, grease, lithium, Mobilith AW-2	1	ea.
39	17500008		msds, adhesive, loctite 242	1	ea.
40	12700541		ADHESIVE,LOC 242(BLUE) .5ML CPSL	1	ea.
41	14202032	00	COVER, CABLE TERMINATION HOUSING, 12"	1	ea.
42	14000296		CLAMP,HOSE, WORM, .31"WD X .44-.78DIA,SS	1	
900	11210070	00	manual, cable term, bhd conn, armored, coax	1	ea.
901	14600209	01	outline dwg, cable term, bhd conn, armored, coax	1	ea.
902	15101000	01	assy dwg, cable term, bhd conn, armored, coax	1	ea.

Item No.	Component Part No.	Rev. No.	Description	Qty.	Unit
-	14103038	01	assy, cable repl kit, bhd conn, armored, coax, .68		
1	13300045	-	cable, coax, armored, ss, .68 OD	0	met.
2	14102920	04	assy, bhd conn & tubing (3/4" ID), 8 pin micro	1	ea.
3	14102771		assy, grip bail, mod .56 to .75 range	1	ea.
4	14103024	00	assy, strain relief, .75 ID x 2.50" OD x 18" (3/4" sleeve,140-223), yellow	1	ea.
5	14201788	00	housing, cable term, bhd, 17"	1	ea.
6	14000223		sleeve, .680 arm cable	1	ea.
7	12500823		screw, fhms, m6 x 12mm, phlps, ss	2	ea.
8	16200023		pin, groove, .125 x 1", ss	4	ea.
9	14000222		dual plug, armored cable, .68 cable	1	ea.
10	-		intentionally left blank	-	-
11	14000291		clamp, hose, smooth band, .47" wide x 1.75-2.75 dia, 316ss	1	ea.
12	14000288		clamp, hose, .31" wide x .50-.91 dia, ss	1	ea.
13	14000284		clamp, hose, .31" wide x .69-1.25 dia, ss	1	ea.
14	14000293		SPLICE,INSUL,CRIMP,8AWG,CLOSED END	3	-
15	14000261		splice, non-ins, par crimp, copper, .21ID	3	ea.
16	12700536		wrap, spiral, 1/2 in, black	50	in
17	12700615		shrink sleeving, pvc, 3" (2:1), standard-wall thk, yellow, 3" long	1	ea.
18	-		intentionally left blank	-	-
19	-		intentionally left blank	-	-
20	-		intentionally left blank	-	ea.
21	-		intentionally left blank	-	in
22	12700510		tie, cable 7.5 x .185 in, black	20	ea.
23	12700029		cable ties, 4"	5	ea.
24	12700612		tubing, .43 ID x .62 OD, 50A duro, silicone, translucent	1	in
25	12700613		tubing, .62 ID x .75 OD, 50A duro, silicone, translucent	1	in
26	12700543		loctite, 277 (red), 10 ml btl	1	ea.
27	12700591		grease, lithium, Mobilith AW-2, NLGI 2, 3 oz cart.	1	ea.
28	13400046		adapter, flush grease fitting tip to 1/8 NPT female	1	ea.
29	13800032		bag, plastic, ziplock, 3x5	1	ea.
30	14000290		clamp, hose, worm, .50" wide x 1.06-2.00 dia, ss	1	ea.
31	12700614		bushing, anti-short, .540" ID, hi-dielectric plastic	1	ea.
32	12700570		SLEEING,SHRNK,.8" X 9",3:1,THK,ADH,POLYOL	1	ea.
33	12700002		SLEEING,SHRINK 1/2 IN BLACK	0	in
34	12700149		SLEEING,SHRINK 1/4 IN BLACK	0	in
35	-		intentionally left blank	-	-
36	13500113		TERMINAL,RING #10 YELLOW	0	ea.
37	17500006		msds, adhesive, loctite 277	1	ea.
38	17500013		msds, grease, lithium, Mobilith AW-2	1	ea.
39	17500008		msds, adhesive, loctite 242	1	ea.
40	12700541		ADHESIVE,LOC 242(BLUE) .5ML CPSL	1	ea.
41	14202032	00	COVER, CABLE TERMINATION HOUSING, 12"	0	ea.
42	14000296		CLAMP,HOSE, WORM, .31"WD X .44-.78DIA,SS	1	
900	11210070	00	manual, cable term, bhd conn, armored, coax	1	ea.
901	14600209	01	outline dwg, cable term, bhd conn, armored, coax	1	ea.
902	15101000	01	assy dwg, cable term, bhd conn, armored, coax	1	ea.

Item No.	Component Part No.	Rev. No.	Description	Qty.	Unit
-	14102920	04	assy, bhd conn & tube (3/4" ID), 8 pin micro		
1	14201791	02	mount, connector, cable term	1	ea.
2	-		intentionally left blank	-	-
3	12900724	01	conn, bhd, 8 pin micro female, ss, coax, 36"	1	ea.
4	-		intentionally left blank	-	-
5	12900661		conn, dummy, 8 pin micro, male	1	ea.
6	13400047		fitting, grease, flush, 1/8" NPTF	1	ea.
7	12700593		tubing, tygon, 3/4" ID x 1" OD, fuel & lube, yellow	5	in.
8	12700594		wire, soft-temper, 304 ss, .051"	10	in.
9	12700595		shrink sleeving, adhesive lined, 1 1/2" (2:1), black	1	in.
10	-		intentionally left blank	-	-
11	12700418	00	grease, silicone, DC4	0.01	ea.
12	12900640		conn, sleeve, locking 2 to 8 pin micro, female	1	ea.
900	15102920	00	assy dwg, bhd conn & tube (3/4" ID), 8 pin micro	1	ea.

Item No.	Component Part No.	Rev. No.	Description	Qty.	Unit
-	14103063	00	assy, tool kit, cable termination, armored, coax, .40"		
1	13400054		driver, cone, (ME243, ME256B)	1	ea.
2	13400055		driver, cone, (ME231A, ME240B, ME243B, ME248B,)	1	ea.
3	13400053		clamp, cable vice jaws, .38 - .43"	1	ea.
4	13400060		drill bit, .125", strght shank, jobbers length, cobalt	10	ea.
5	13400061		file, American-pattern, 3-square, bastard cut, 6"	1	ea.
6	13400065		knife, utility, retractable (w/ extra blades)	1	ea.
7	13400062		grease gun, 3 oz. cartridge size, w/ 1/8" NPT male thread	1	ea.
8	12700591		grease, lithium, Mobilith AW-2, NLG12, 3 oz cartridge	1	ea.
9	12700440		wipe alcohol	10	ea.
10	17500010		msds, wipe, alcohol, isopropyl	1	ea.
11	17500013		msds, grease, lithium, Mobilith AW-2	1	ea.

Item No.	Component Part No.	Rev. No.	Description	Qty.	Unit
-	14103064	00	assy, tool kit, cable termination, armored, coax, .45"		
1	13400041		driver, cone, (ME249A, ME250A, ME262B)	1	ea.
2	13400052		driver, cone, (ME244B, ME251B, ME253B)	1	ea.
3	13400058		clamp, cable vice jaws, .50 - .56"	1	ea.
4	13400060		drill bit, .125", strght shank, jobbers length, cobalt	10	ea.
5	13400061		file, American-pattern, 3-square, bastard cut, 6"	1	ea.
6	13400065		knife, utility, retractable (w/ extra blades)	1	ea.
7	13400062		grease gun, 3 oz. cartridge size, w/ 1/8" NPT male thread	1	ea.
8	12700591		grease, lithium, Mobilith AW-2, NLG12, 3 oz cartridge	1	ea.
9	12700440		wipe alcohol	10	ea.
10	17500010		msds, wipe, alcohol, isopropyl	1	ea.
11	17500013		msds, grease, lithium, Mobilith AW-2	1	ea.

Item No.	Component Part No.	Rev. No.	Description	Qty.	Unit
-	14103065	00	assy, tool kit, cable termination, armored, coax, .525"		
1	13400051		driver, cone, (ME253A, ME256A, SP-563)	1	ea.
2	13400052		driver, cone, (ME244B, ME251B, ME253B)	1	ea.
3	13400058		clamp, cable vice jaws, .50 - .56"	1	ea.
4	13400060		drill bit, .125", strght shank, jobbers length, cobalt	10	ea.
5	13400061		file, American-pattern, 3-square, bastard cut, 6"	1	ea.
6	13400065		knife, utility, retractable (w/ extra blades)	1	ea.
7	13400062		grease gun, 3 oz. cartridge size, w/ 1/8" NPT male thread	1	ea.
8	12700591		grease, lithium, Mobilith AW-2, NLGI2, 3 oz cartridge	1	ea.
9	12700440		wipe alcohol	10	ea.
10	17500010		msds, wipe, alcohol, isopropyl	1	ea.
11	17500013		msds, grease, lithium, Mobilith AW-2	1	ea.
12	13400066		wire strippers, 10-20 AWG, plier tip & cutters	1	ea.
13	13400067		punch, pin, 1/8" x 4 3/4 OAL	1	ea.
14	13400068		crimper / cutter, 8", hand	1	ea.
15	13400046		adapter, flush grease fitting tip to 1/8 NPT female	1	ea.
16	13400040		hook tool, 5" x .33"	1	ea.

Item No.	Component Part No.	Rev. No.	Description	Qty.	Unit
-	14103066	00	assy, tool kit, cable termination, armored, coax, .68"		
1	13400056		driver, cone, (ME268A, ME299B)	1	ea.
2	13400057		driver, cone, (ME262A, ME268B)	1	ea.
3	13400059		clamp, cable vice jaws, .75"	1	ea.
4	13400060		drill bit, .125", strght shank, jobbers length, cobalt	10	ea.
5	13400061		file, American-pattern, 3-square, bastard cut, 6"	1	ea.
6	13400065		knife, utility, retractable (w/ extra blades)	1	ea.
7	13400062		grease gun, 3 oz. cartridge size, w/ 1/8" NPT male thread	1	ea.
8	12700591		grease, lithium, Mobilith AW-2, NLGI2, 3 oz cartridge	1	ea.
9	12700440		wipe alcohol	10	ea.
10	17500010		msds, wipe, alcohol, isopropyl	1	ea.
11	17500013		msds, grease, lithium, Mobilith AW-2	1	ea.