

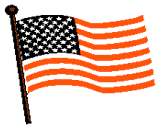


Design and Manufacture of Video Pipeline Inspection Systems
A full Service Company
www.rstechserv.com

6" Crawler Transport Vehicle

Model 32-05000

OPERATIONS MANUAL



Made in the USA

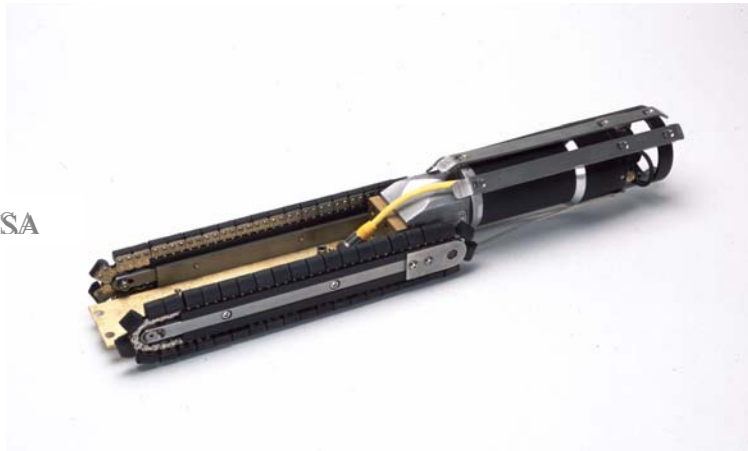


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Product Overview

R.S.Technical Services: 6” CRAWLER



The RST crawler is a tread drive camera transporter designed to carry the OEIII series cameras using R.S. Technical Service single conductor cable. The compact, easy to use unit is adaptable for use in sanitary sewer, storm sewer, and water main pipelines 6” to 15”(by using the axle extensions and riser blocks). The weight of the crawler can be adjusted to improve traction if needed. Using sincon cable, the unit travels three-speed in forward, one speed reverse with freewheel for practical operation. The crawler is controlled by the auxiliary control box or the hand held control box and the Controller Power Supply.

For optimum performance, the crawler must be clean and properly maintained. The crawler should be setup to the proper width adjustment for the diameter pipe being inspected. The crawler must be clean and treads properly maintained. Operate transport with the flow. Water flow should be minimal. The pipeline should be clean as possible.

Technical Specifications: R.S.T. 6" CRAWLER

Minimum pipe size: 6"

Maximum pipe size: 15 "

Maximum distance: 1500 feet. (Depending on cable
and line conditions)

Speeds: 3 forward, up to 55-feet per minute max.

1 reverse. (Low speed only)

Stop/hold.

Free wheel rapid retrieval.

Power: 70 to 120VDC from camera cable.

Internal auto limiting @ 2 amps.

Motor type: 1/3 horsepower high torque motor.

Drive type: 18.5:1 gear head to #35 chain drive, utilizing
dual riveted, contoured pads.

Length: 27-1/2" w/o camera.

33-1/4" w/camera

Width: 5" min. (6" setup)

Height: 4-7/16" min. (6" setup)

Weight: 28 lbs. Min. (6" setup, w/o camera)

39 lbs. Min. (6" setup, w/camera)

Operator and Equipment Safety

It is important to be familiar with operations, maintenance, and safety issues when working with RST equipment.



Read the entire manual before operating the equipment.

To prevent personal injury or damage to equipment, **turn off Camera power**. When making electrical connections, width adjustments, and when maintaining the tractor or camera, disconnect all power to the control station before servicing.

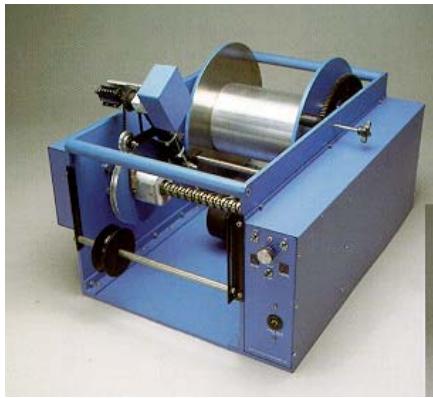
Inspect all transport, camera, lighting cables, and bridles before and after each use. Replace any broken, worn or frayed bridles or cables.



Always use care when near an open manhole, and when climbing in or out of a TV inspection vehicle. The tractor and camera assembly can be placed into the pipeline **without** personnel entering the manhole. Use proper lifting ropes, cranes and winches for lifting equipment in/out of pipes.

Equipment Compatibility

The RST crawler is designed for use with mainline vehicle mounted systems as well as Portable Mainline systems. This transport requires the use of a power unit, control box, cable reel and camera.



RST Main Line Reel



RST Portable Reel



RST Omni Eye III Zoom



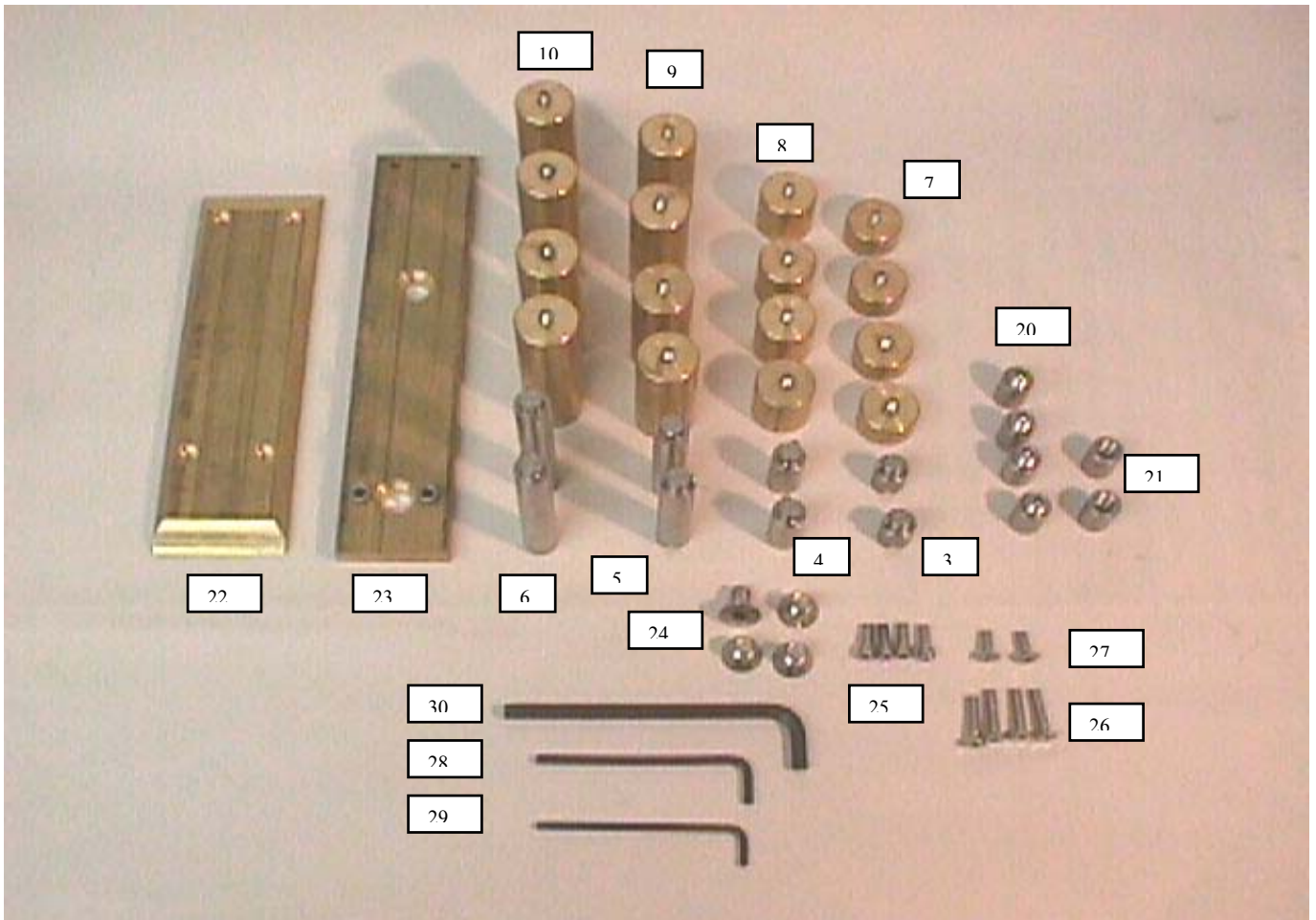
RST Omni Star

It may be possible for the RST crawler to operate with other brands of inspection equipment. Contact your dealer or RST for possible applications.

Accessory Kits for 6" Crawlers

The RST crawler generally comes with the following accessories:

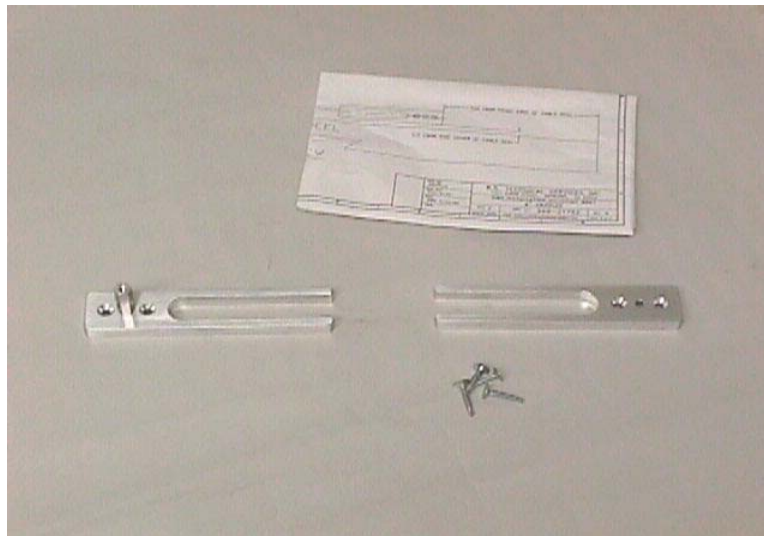
Standard extension & camera mounting kit for 6" to 15" applications
Part number **840-30586**.



840-30586 KIT, ACCESSORIES, 6" CRAWLER

| | | | |
|----|--------------|--|---------|
| 1 | 701-30994 | BOX, TOOL, PLASTIC, W/TRAY | 1.0 EA. |
| 2 | 706-30754 | LABEL, KIT, ACCESSORIES, 6" CRAWLER | 1.0 EA. |
| 3 | 867-30920 | ASSY, COUPLING, EXTENSION, .87", CRAWLER | 2.0 EA. |
| 4 | 867-30921 | ASSY, COUPLING, EXTENSION, 1.50", CRAWLER | 2.0 EA. |
| 5 | 867-31713 | ASSY, COUPLING, EXTENSION, 2.37", CRAWLER | 2.0 EA. |
| 6 | 867-30922 | ASSY, COUPLING, EXTENSION, 3.18", CRAWLER | 2.0 EA. |
| 7 | 867-30925 | ASSY, SPACER, 87" LONG, EXTENSION SET, CRAWLER | 4.0 EA. |
| 8 | 867-30926 | ASSY, SPACER, 1.50" LONG, EXTENSION SET, CRAWLER | 4.0 EA. |
| 9 | 867-30927 | ASSY, SPACER, 3.18" LONG, EXTENSION SET, CRAWLER | 4.0 EA. |
| 20 | 800-17114 | ASSY, SPACER, 1.0", M/L TRACTOR TREAD | 4.0 EA. |
| 21 | 402-17109 | SPACER, MTG., 1.0"EXTENSION, ML TRACTOR TREAD | 2.0 EA. |
| 22 | 453-30916-23 | PLATE, BALLAST, BOTTOM, 6" CRAWLER PLATED | 1.0 EA. |
| 23 | 867-3093 | ASSY, PLATE, MTG., OE3 CAMERA, CRAWLER | 1.0 EA. |
| 24 | 301-12650 | MSCR, FLT, HXS, 1/2-13X.75 SS | 4.0 EA. |
| 25 | 301-11005 | MSCR, SHCS, 1/4-20X.62 SS | 4.0 EA. |
| 26 | 301-11360 | MSCR, FLT, HXS, 1/4-20X1.25 SS | 4.0 EA. |
| 27 | 301-11183 | MSCR, FLT, HXS, 1/4-20X.75 SS | 2.0 EA. |
| 28 | 634-10642 | WRENCH, ALLEN, 3/16, LONG ARM | 1.0 EA. |
| 29 | 634-11114 | WRENCH, ALLEN, 5/32, LONG ARM | 1.0 EA. |
| 30 | 634-17242 | WRENCH, ALLEN, 5/16, LONG ARM | 1.0 EA. |

Options



Truck mount kit; part #840-21751.

Operation System Power



CAUTION: NEVER HOOK UP OR DISCONNECT ANY EQUIPMENT WITH POWER TURNED ON!

The Inspection System requires a steady supply of 120VAC to operate properly. Before starting of the generator or connecting shore power, make sure that ALL equipment inside the vehicle has been turned OFF. Turn down the controls for camera power and cable reel speed. After all equipment has been checked, connect the shore power cord.

If a generator is to be used, allow the generator to warm up for a few minutes.

Note: Diesel generators use a different control panel that is separate from the controller power supply. Refer to the appropriate generator operators manual for starting.

Verify that the voltage and frequency indicators on the controller power supply are in the green normal zone.



Caution: Before turning on any equipment, plug the keyboard into the data collection system. Plug the Auxiliary Control Box into the Auxiliary Control jack on the controller power supply.



Caution: If the voltage or frequency fluctuates into the red zones on the controller power supply, DO NOT turn on any of the equipment in the truck. Check shore power or the generator for proper operation, or have them checked by a qualified technician.



Caution: Route cords away from traffic or wet areas to avoid tripping on power cords.

Placement of Inspection Truck

Locate the back of the truck so that the cable reel lines up in the direction of the pipeline to be inspected.
Allow room to work around the opening while carrying the equipment.
Pull camera/tractor far enough into pipeline to clear the bridle or cable grip.
Check all camera and tractor functions again before proceeding.
Move tractor forward so the rear of the tractor and the cable connections are fully inside the pipe.
Set up down hole poles, shoes and manhole roller.
Reset the footage counter.
Release the drag brake on the cable reel.
Set cable reel in the free wheel.



Keep enough room to work around the opening while carrying the equipment.

Placing the equipment into the line

Follow cable grip, bridle and pig tail instructions.
Re-check the pipeline size and extension adjustments.
Do not let cable “loop” at the location where it enters pipeline.
Use guide poles with hook to keep the crawler stable as it enters pipeline.



Caution: Maintain control of equipment while loading and unloading into manhole.
Most equipment damage occurs when camera is lowered into hole.

Pull camera/crawler far enough into pipeline to clear the bridle or cable grip.
Set the cable guide.
Use double roller and/or single rollers, for protecting the cable and allowing it to slide down the hole without drag on the line.
Use enough poles to clear top of the manhole by 2 feet



Caution: Watch out for people, power lines and traffic when handling the downhole pole

Crawler Operation

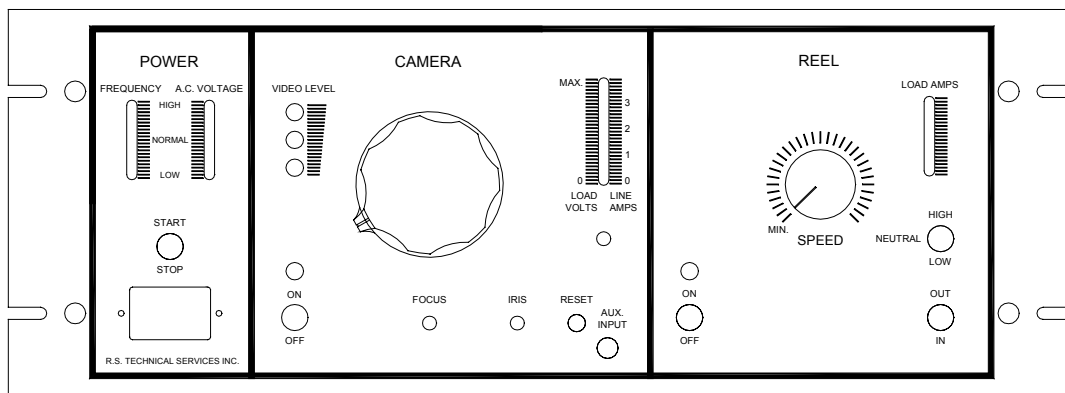
Ensure that the Camera ON/OFF switch is in the **OFF** position before connecting camera to tractor unit, or auxiliary control box to the Controller Power Supply.

Set the LIGHT INTENSITY control to “**MINIMUM**”, or full counter clockwise position.

Set the REEL SPEED control to the ‘**MINIMUM**’, or full counter clockwise.

When power is applied to the controller power supply, the Frequency and Voltage indicators will be in the normal range.

Controller Power Supply



Camera control on the Controller Power Supply

The adjustable camera power supply provides a nominal 120V DC to the camera, transporter, and other down-hole inspection equipment. This section has video processing circuitry which extracts the video transmitted by the under ground camera into a NTSC video format. Also incorporated in to the controller is an audio microphone preamplifier, which provides audio for a VCR.

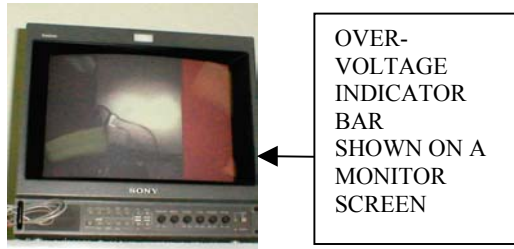
The Camera ON/OFF switch controls the camera power supply. Above the switch is a green LED to indicate that the camera power supply is **on**.

The Camera POWER control knob adjusts the output Voltage of the power supply. This control adjusts the light intensity of the remote camera. This also can adjust speed of the transporter unit.

To engage Crawler in forward gear, turn on Controller Power Supply, and press “**Tractor/ Low Speed**” on Auxiliary Control Box.

To change speed of Crawler, press “**Tractor/ Med.**” or “**Tractor / High Speed**” on Auxiliary control box. **Always start the Crawler in the “Tractor / Low Speed”.**

Increase **power** control knob until a red bar appears on the screen. Decrease **power** knob until red bar just leaves the screen. Camera and transporter power does not increase after red bar limit appears on the screen.



Caution: *Do not operate equipment with the over limit red bar on screen.*

Increase **camera power** until the red bar appears on monitor screen and reverse power until red bar just leaves the screen.

Reduce power before coming to a stop.

To stop Crawler, press “**Stop**” button on Auxiliary control box.

To engage Crawler in reverse, press “**Free Wheel**” on Auxiliary control box. The Crawler has one reverse speed.

Do not back over the Sincon Cable.

The Crawler has an automatic “disengage” feature that allows for the freewheeling retrieval. To disengage the Crawler, momentarily reverse the direction of Crawler. This will disengage the drive mechanism and allow the Crawler to be pulled out of the pipeline in “freewheel” by the cable reel.

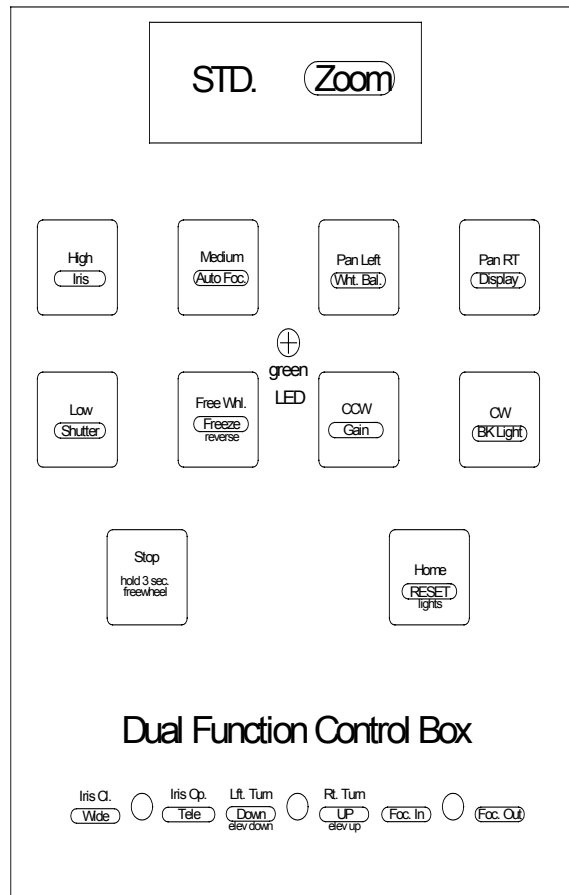
Pull the Sincon Cable and Crawler back using cable reel with Crawler in free wheel.

To “free wheel” Crawler when traveling forward, press “**Stop**” on Auxiliary control box. **Note: The Crawler must go into reverse, and then be stopped, to enable Crawler to free wheel.**

Press “**Free Wheel**” on Auxiliary control box.

When the Crawler starts to move in reverse, press “**Stop**” on Auxiliary control box.

If Crawler is traveling in reverse and you want the Crawler to “free wheel”, press “**Stop**” on Auxiliary control box.



Auxiliary Control Box

Button function: Crawler Controls

| | | |
|-----------------------|-----------|--|
| High | (tractor) | high speed in tractor mode |
| Medium | (tractor) | medium speed in tractor mode |
| Low | (tractor) | low speed in tractor mode |
| Free Whl./ reverse | (tractor) | free wheel tractor/ reverse tractor |
| Stop | (tractor) | all stop (tractor)/ hold three seconds for freewheel |

Pipeline Inspection Run

Start the VCR.

Record condition of manhole.

Recording inside pipeline may have to be started before the footage is set.

Run Crawler / camera through pipeline slowly enough to spot defects.

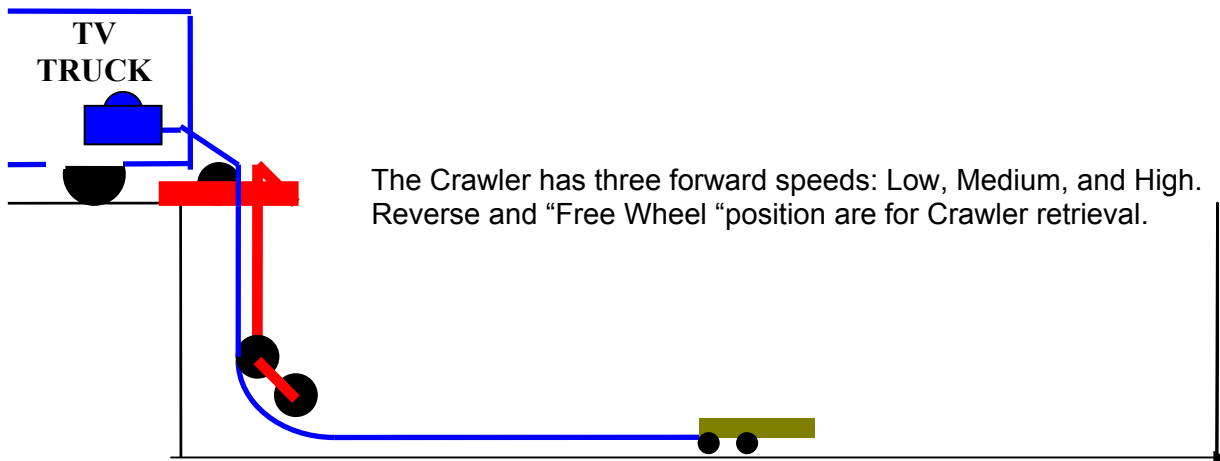
Do not force Crawler /camera past any large amount of debris.

Beware of large root masses.

Use extra caution around severe offset joints or protruding laterals.

Take notes when passing obstacles or severe offset joints, protruding laterals. The Crawler will be passing these on the way back.

INSPECTION WITH CRAWLER



Maintenance

Each time the crawler is removed from the pipeline the entire assembly should be washed cleaned.

A light spray of chain oil should be used on each track assembly.

Inspect individual crawler feet for damage. Replace if necessary.

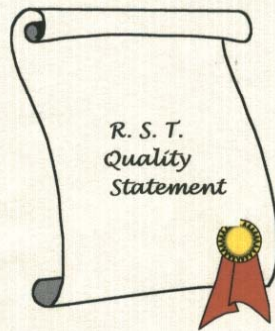
Inspect the power cable, bridle, and connector to make sure they have not been damaged.

Inspect the camera clamps, skids, and mounting hardware.

Inspect bridle, skids, rails, and pigtail connections.

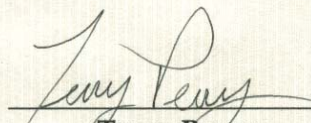


Design and Manufacture of Video Pipeline Inspection Systems
A Full Service Company
SALES SERVICE PARTS



EACH PIECE OF R.S. TECHNICAL SERVICES, INC. MANUFACTURED EQUIPMENT IS SUBJECT TO STRICT STANDARDS OF QUALITY AND WORKMANSHIP ESTABLISHED BY OUR ENGINEERING AND QUALITY ASSURANCE DEPARTMENTS.

THROUGH A SYSTEMATIC INSPECTION PROGRAM, THE QUALITY ASSURANCE INSPECTION PROCEDURES ENSURE THAT ALL THE EQUIPMENT AND PARTS MEET OR EXCEED THOSE STANDARDS.


TERRY PERRY
QUALITY ASSURANCE MANAGER



Design and Manufacture of Video Pipeline Inspection Systems
A Full Service Company
SALES SERVICE PARTS

LIMITED WARRANTY POLICY

R.S. Technical Services, Inc. (RST) warrants all items of our manufacture for defects in materials and / or workmanship for one (1) year from date of receipt by the Customer. (unless otherwise stated)

This policy is limited to items manufactured by RST. i.e. Camera, Reels, Controllers, Data Displays, Winches and Tractor Transport Vehicles.

In the event of any malfunction or failure of the equipment, the customer is required to request authorization from RST to return defective parts or components by calling the RST toll-free number- **1-800-767-1974** and requesting a MRA number. (see Figs. 1 & 1A for an example of the form.)

The returned parts or components shall include a packing list, part identity, and the reason for the return of the part.

Freight costs are the responsibility of the Customer unless otherwise agreed to by RST.
All in warranty equipment in need of repair shall be shipped to:

R.S. Technical Services, Inc.
1327 Clegg St.
Petaluma, CA 94954

or

R.S. Technical Service, Inc
292 Midland Trail
Mt. Sterling, KY 40353

RST shall at our option, repair or replace any defective part or component in our service facility, or ship the customer a replacement component or part.

The customer shall return the defective part or component within ten (10) working days after receipt of the replacement for credit.

Not covered by this policy are expendable or wear-out items i.e. light bulbs, drive belts, cable connectors.

The generator, monitors, VCRs and air conditioner shall be covered by the Manufacturer's warranty and any services shall be referred to each Manufacturer's service organization.

No warranty shall be applicable to malfunctions due to damage, neglect, wear, misuse, or improper handling or repairs to any part of the equipment.

Improper repairs are deemed to be repairs made by persons other than factory authorized personnel or repairs not made in accordance with and covered by the manufacturer's service manuals, or repairs utilizing parts or materials not equal to those furnished by the manufacturer.

NOTE: Any un-authorized repairs of any RST equipment will invalidate the warranty.

The responsibility of R.S. Technical Services is set forth above.

RST shall not be liable for any consequential or incidental damages to persons or property resulting from use of or any breach of warranty expressed or implied, to this (these) products.



MERCHANDISE RETURN AUTHORIZATION (MRA) POLICY

Instructions

Returns will not be processed without Customer Information.

Note: There will be a charge of \$25.00 to research incomplete information.

MRA # - Enter the number assigned to this return by RST.

Customer Return Address - If this item is to be returned to you, enter your shipping address.

Bill To - Complete if your billing address is different than your shipping address or if you have a distributor.

Return Authorized By - Enter the name of the RST employee approving this return. Always call before returning any item. Items received without a MRA # will be delayed in handling and subject to a \$25.00 research fee.

P.O. Required - If you issue P.O. Numbers, check the required box. If you issue P.O. Numbers before repair, enter the number here.

Estimate if Over - Enter the maximum you can authorize without being contacted by RST for approval. This will add time to your repair.

Estimate Before Repair - Check the appropriate box.

Repair, Replacement, Loaner, Credit - Check the appropriate box. Include invoice number if return is for credit.

Credit Invoice - You must include an invoice number to receive a credit.

Other - Note in space why item is being returned.

Model - Enter the RST Model # of the unit you are returning. If you do not know the model #, the authorizing person can help you or use the description line.

Serial Number - A serial number is stamped on most RST units. If you are returning a part, use the serial number from the unit in which the part is used.

Describe Reason Returning - Give as much information as possible describing your reason for returning the item.

Should you have any questions please contact Customer Service at 800-801-1199.



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THE FOLLOWING FORM IS PROVIDED FOR YOUR CONVENIENCE

MAKE COPIES OF THE FORM FOR YOUR USE.

FILL OUT THE FORM COMPLETELY AND OBTAIN AN MRA NUMBER

MAKE A COPY OF THE COMPLETED FORM FOR YOUR RECORDS

**INCLUDE THE ORIGINAL WITH THE EQUIPMENT OR PART (S) THAT ARE BEING
RETURNED.**



R.S. Technical Services, Inc.
1327 Clegg Street
Petaluma, CA 94954
707-778-1974

Date: _____

MRA #

Customer Return Address:

Bill To / Distributor:

Contact: _____ Phone: _____ Fax: _____

Return Authorized by: _____

- | | |
|--|---|
| <input type="checkbox"/> P.O. Required # _____ | <input type="checkbox"/> Replacement |
| <input type="checkbox"/> Estimate Required if over _____ | <input type="checkbox"/> Credit Invoice # _____ |
| <input type="checkbox"/> Estimate Required Before Repair | <input type="checkbox"/> Other: _____ |
| <input type="checkbox"/> Repair _____ | |

Model Number _____ Description _____

Serial Number: _____

Briefly Describe Reason for Return: _____

RST Use Only: _____

