

R S Technical Services, Inc.
Design and Manufacture of Video Pipeline Inspection Systems
A Full Service Company
SALES SERVICE PARTS

6" Crawler Transport Vehicle

Model 32-05000

INSTALATION MANUAL



Made in the USA

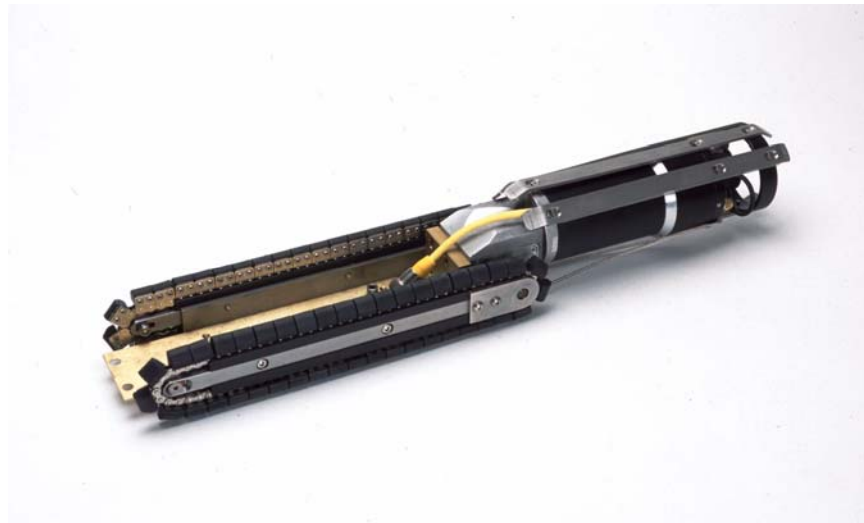


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Technical Specifications



Minimum pipe size: 6 inches.

Maximum pipe size: 15 inches.

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: ¼ horsepower high torque motor.

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

Length: 27½ inches w/o camera.
31 ½ inches w/camera

Width: 5 inches minimum. (6 inches setup)

Height: 4 7/16 inches minimum. (6 inches setup)

Weight: 28 lbs. Minimum. (6 inches setup, w/o camera)
39 lbs. Minimum. (6 inch setup, w/camera)

Operator and Equipment Safety



It is important to be formalized with operations, maintenance and to know the 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 power**, disconnect all power to the control station and the transport/camera/lights when making electrical connections, width adjustments or performing maintenance.

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

Verify all system power is **off** before connecting or disconnecting cables.

Always use care when near or at an open manhole. Always use care when climbing in or out of a TV truck. Always use proper lifting ropes, cranes and winches for lifting equipment in/out of pipes.

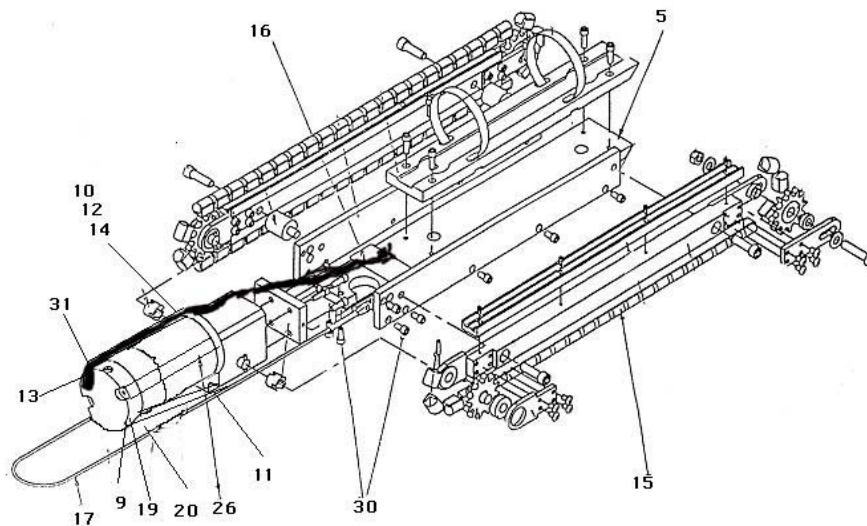
The use of downhole equipment will extend the life of your sincon cable and give you more footage on a run.



Always have power off before working with pigtails and camera power cables.

866-31672 Assembly, Crawler 6-15", 6 PIN SC

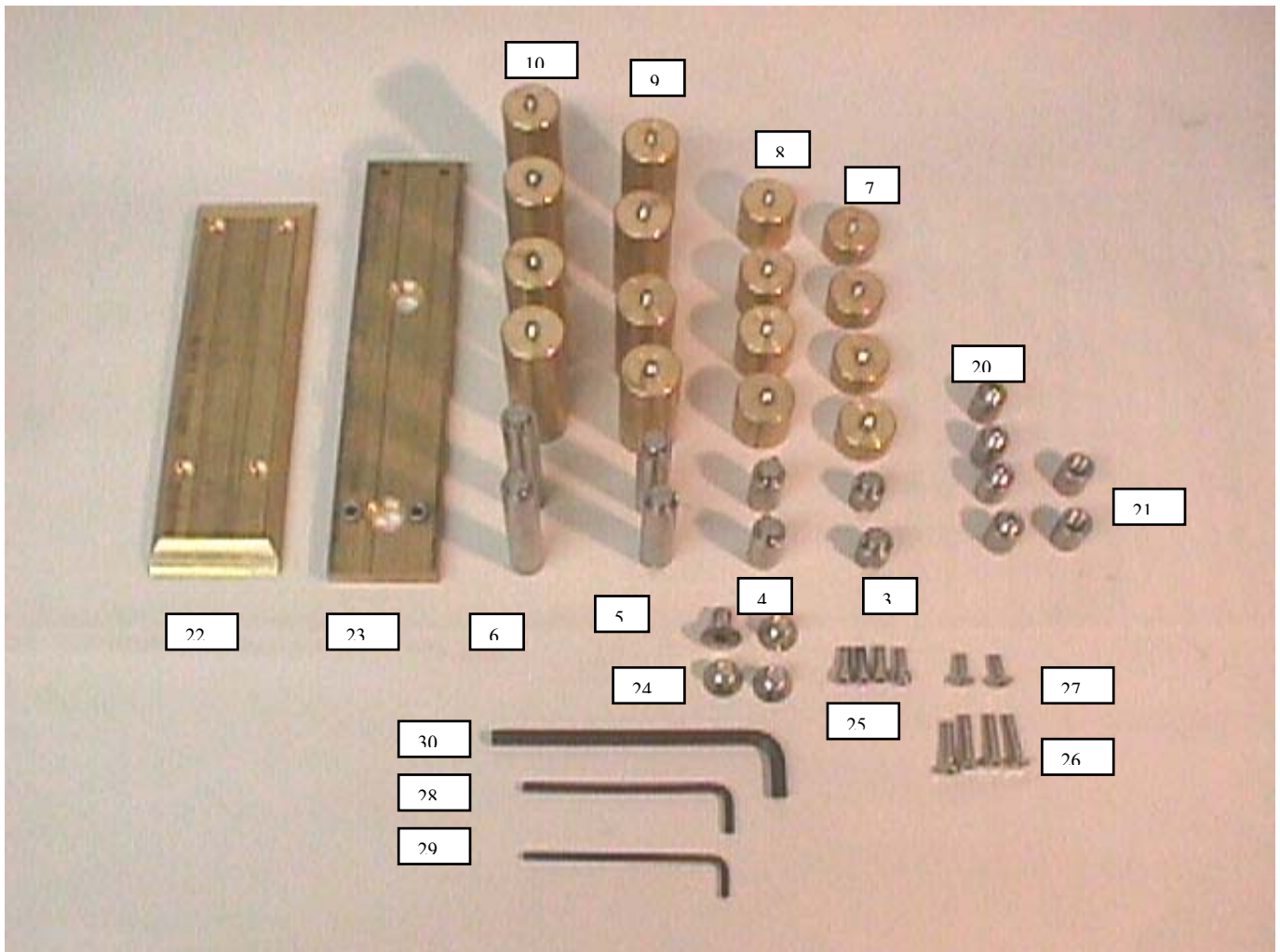
5	802-24124	ASSY,TRACTOR BODY, CRAWLER, 6-15"	1.0 EA
9	301-12707	MSCR,FLT,PHH,10-32X.50 SS	7.0 EA
10	451-30597	TOP COVER, RAIL, SC, 6"	1.0EA
11	450-30580	SKID, BOTTOM, MOTOR, SC, 6"	1.0 EA
12	450-30507	SKID, TOP, MOTOR, SC, 6"	3.0 EA
13	410-19071-21	RING, PRTCTR,TNC & PIG TAIL	1.0 EA
14	403-13419	SPACER,SKID, TOP CENTER ONLY	1.0 EA
15	866-30378	ASSY,TREAD DRIVE, 6-15"	2.0 EA
16	806-30399	ASSY,CBL,OE3 CAMERA TO SC CRAWLER, 22.5"	1.0 EA
17	867-31408	ASSY, BRIDLE,TOE,.25" EYELETS,60"	1.0 EA
19	449-30327	CLAMP,LOOP,.125" CABLE, SS	2.0 EA
20	301-12765	MSCR,PAN,PHH,8-32X.37 SS	2.0 EA
26	805-31577	ASSY,MOTOR/GEARBOX,6 PIN CRAWLER SC	1.0 EA
30	301-11005	MSCR, SHCS,1/4-20X62 SS	6.0 EA
31	301-12591	MSCR,FLT,PHH,8-32X.75 SS	3.0 EA



ASSEMBLY CRAWLER6-15", 6 PIN SC 866-31672

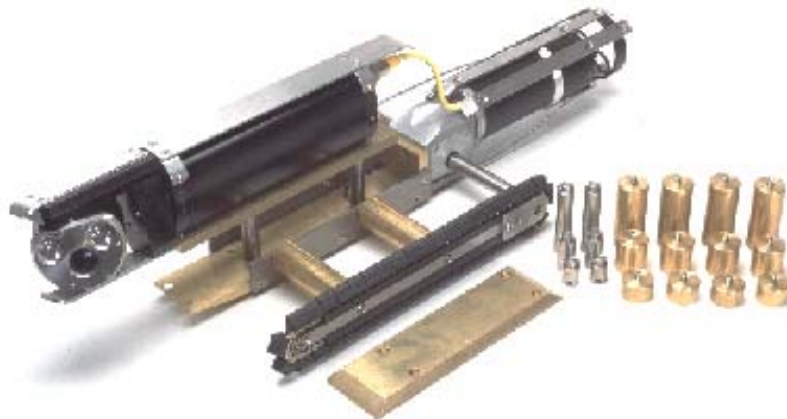
Setup

Before you can begin to televise the line, the unit needs to be setup for the proper line size. Keep in mind that in some situations it may be necessary to set up the crawler one line size smaller. The most common size change will be made by spreading out the tracks. Another method is to raise the camera in the housing. For the larger line size, a combination of the two methods will be used. It is important to note that there is no left or right sides in regards to the tread drive assembly.



840-30586 KIT, ACCESSORIES, 6"-15" CRAWLER

1	701-30994	BOX, TOOL, PLASTIC, W/TRAY, 19"L X 9.5"W X 9.5"H	1.0	EA.
2	706-30754	LABEL, KIT, ACCESSORIES, 6" CRAWLER	1.0	EA.
3	867-30920	ASSY, COUPLING, EXTENSION, .87", CRAWLER, 6"	2.0	EA.
4	867-30921	ASSY, COUPLING, EXTENSION, 1.50", CRAWLER, 6"	2.0	EA.
5	867-31713	ASSY, COUPLING, EXTENSION, 2.37", CRAWLER, 6"	2.0	EA.
6	867-30922	ASSY, COUPLING, EXTENSION, 3.18", CRAWLER, 6"	2.0	EA.
7	867-30925	ASSY, SPACER, .87" LONG, 8" EXTENSION SET, 6" CRAWLER	4.0	EA.
8	867-30926	ASSY, SPACER, 1.50" LONG, 10" EXTENSION SET, 6" CRAWLER	4.0	EA.
9	EXAMPLE	ASSY, SPACER .87" AND 1.50" LONG, 12" EXTENSION SET	4.0	EA.
10	867-30927	ASSY, SPACER, 3.18" LONG, 15" EXTENSION SET, 6" 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	PLATE, BALLAST, BOTTOM, 6" CRAWLER PLATED	1.0	EA.
23	867-30937	ASSY, PLATE, MTG., 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.
31	634-10878	WRENCH, ALLEN, 5/64	1.0	EA.



6" Line setup

Tread drive assembly 6" setup:



The tracks are attached directly to the main body without any spacers.

With the tracks removed:

1. Set unit on its side.
2. Match the drive end of the tread drive assembly to the motor axle. Line up the pin on the motor axle with the slot in the drive sprocket. (Photo #1.)
3. Line up the mounting holes and attach the assembly with the two screws (item #25) 1/4- 20X.62". Then tighten with 3/16" Allen wrench (item # 28) (Torque to 150 inch pounds).

Repeat for other side.

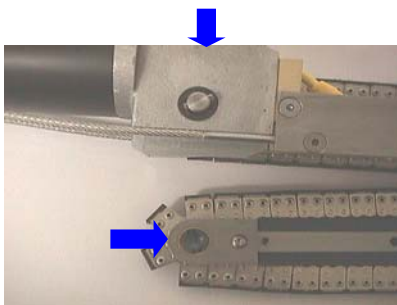


Photo 1

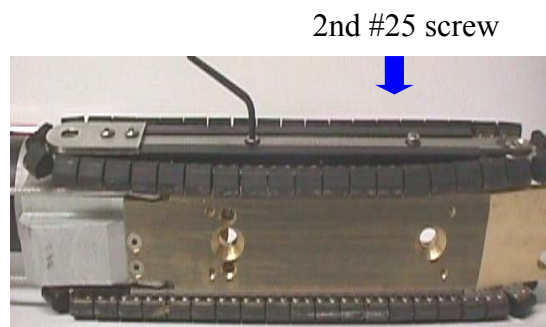


Photo 2

6" Line Setup:



Install Camera:

Make sure the camera and crawler are clean before assembly.

1. Place camera upside down on flat surface, turn over crawler and set over the camera lining up the mounting holes.
2. Start by hand the two screws (item #26) in rear mounting holes.
3. Start by hand the two screws (item #27) in front mounting holes.
4. Tighten rear screws using 5/32 Allan wrench (item #29) to 100 inch/lbs. (Reference to photo #1)
5. Tighten front screws using 5/32 Allan wrench (item #29) to 100 inch/lbs.
6. NOTE: Always tightens rear screws first. (Reference parts to page 7 & 8)
7. Turn assembled unit to its upright position.
8. Locate the indexing notch on the camera power cable and align with the indexing tab on the bulkhead connector. Insert the aligned connectors and carefully tighten the nut while gently rocking the connector to seat it for a watertight connection. (Reference photo #2 and #3)

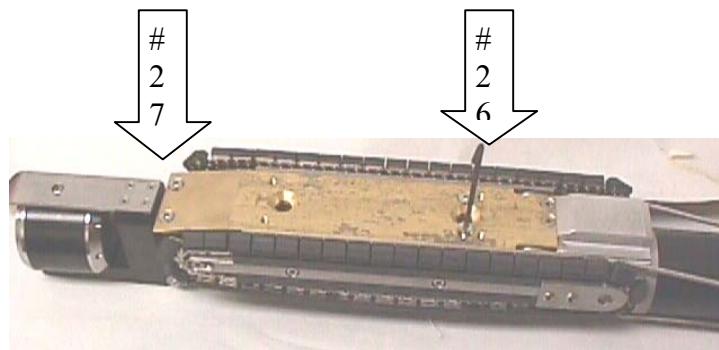
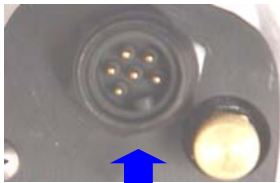


Photo 1

Bulkhead connector



Indexing Tab
Photo 2

Camera power cable



Indexing notch
Photo 3

8" Line setup



Tread drive assembly 8" setup:

The tracks are attached to the main body with the .87" spacers.

With the tracks removed:

1. Set unit on its side.
2. Screw the studded end of the .87" spacers (item #7, 2 per side), to the tread drive mounting plates and hand tighten. (Reference photo #2)
3. Set the .87" tractor drive extension (item #3) on the drive axle, lining up the slot on the extension with the pin in the axle. (Reference photo #1)
4. Match the drive end of the tread drive assembly to the tractor drive extension.
5. Line up the mounting holes and attach the assembly with the two screws (item #25 1/4-20x.62"). Then tighten with 3/16" Allen wrench (item # 28). (Torque to 150 inch pounds) Reference photo #3.
Repeat for other side.



Photo 1

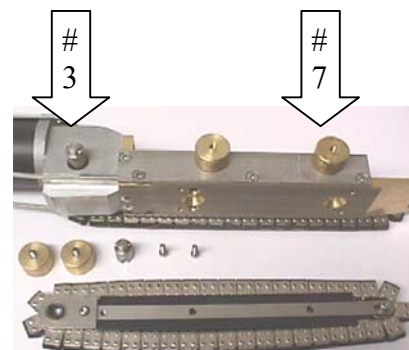
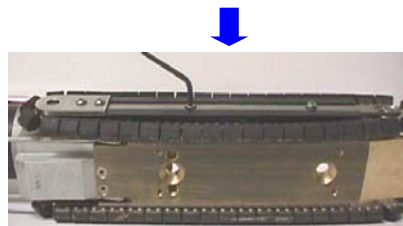


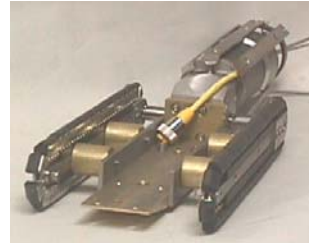
Photo 2



2nd #25 screw
Photo 3

10" Line setup:

Tread drive assembly 10"



The tracks are attached to the main body with the 1.5" spacers.

With the tracks removed:

1. Set unit on its side.
2. Screw the studded end of the 1.5" spacers (item #8, 2 per side), to the tread drive mounting plates and hand tighten. (Reference photo #2)
3. Set the 1.5" tractor drive extension (item #4) on the drive axle, lining up the slot on the extension with the pin in the axle. (Reference photo #1)
4. Match the drive end of the tread drive assembly to the tractor drive extension.
5. Line up the mounting holes and attach the assembly with the two screws (item #25) 1/4-20X .62". Then tighten with 3/16" Allen wrench (Item #28). (Torque to 150 inch pounds) (Reference photo #3) Repeat for other side.



Photo 1

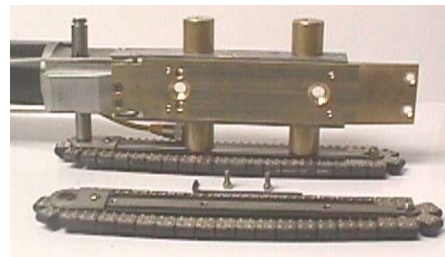
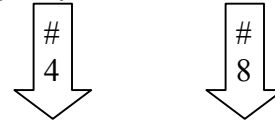


Photo 2

2nd #25 screw

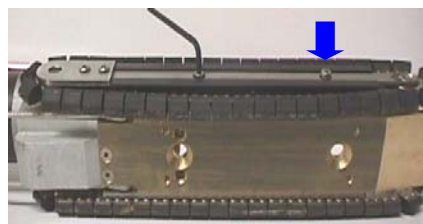


Photo 3

10" Line setup:

Install camera:



1. Locate the camera mounting plate (item #23) and the two 1" long threaded spacers (item #21). Fasten the 1" spacers on to the mounting plate using the two mounting screws (item # 24) 1/2"-13 FLT. HEX SS and hand tighten with a 5/16" Allen wrench (item # 30). (Reference photo #1)
2. Set the camera on its top and lay camera mounting plate on the camera, lining up the mounting holes. (Reference photo #2)
3. Install the four camera mounting screws (item #26) and hand tighten using 5/32" Allan wrench (item #29). (Reference photo #1)
4. With the camera still on it's top set the tractor over the camera mounting plate lining up the mounting holes. (Reference photo #2)
5. Install the two the 1" spacer mounting screws (item #24) and hand tighten using 5/16" Allen wrench (item # 30). (Reference photo #2)
6. Turn assembled unit to its upright position.
7. Locate the indexing notch on the camera power cable and align with the indexing tab on the bulkhead connector.
8. Insert the aligned connectors and carefully tighten the nut while gently rocking the connector to seat it for a watertight connection. (Reference page 9)

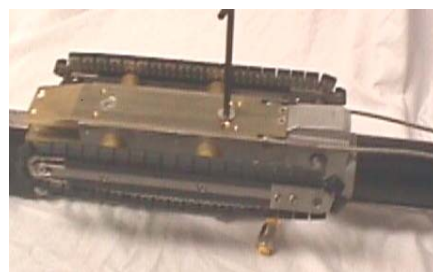
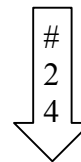
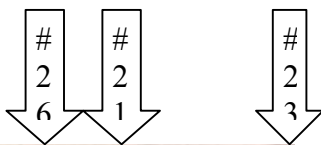


Photo 1

Photo 2

12" Line setup:



Tread drive assembly 12" setup:

The tracks are attached to the main body with the .87" and the 1.5" spacers.

With the tracks removed:

1. Set unit on its side.
2. Screw the .87" long spacer (item #3) to the 1.5" long spacer (item #4). Screw the studded end of the 1.5" spacers to the tread drive mounting plates, Hand tighten. (2 assemblies per side) (Reference photo #2 and #3)
3. Match the drive end of the tread drive coupling to the 2.37" tractor drive extension. (item #5) (Reference photo #1 & #2)
5. Line up the mounting holes and attach the assembly with the Two screws item #25 (1/4-20x62"). Then tighten with 3/16" Allen wrench (item #28). (Torque to 150 inch pounds) (Reference photo #3)

Repeat for other side.



Photo 1

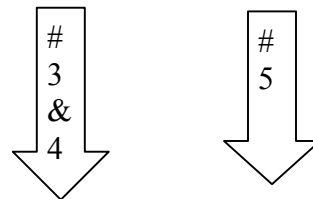


Photo 2

2nd #25 screw

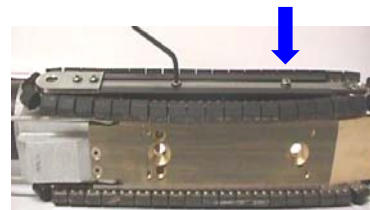


Photo 3

Photo 4

12" Line setup:

Install camera:



1. Locate the camera mounting plate (item #23) and the two 1" long threaded spacers (item #21). Fasten the 1" spacers on to the mounting plate using the two mounting screws (item # 24) 1/2"-13 FLT. HEX SS and hand tighten with a 5/16" Allen wrench (item # 30). (Reference photo #1)
2. Set the camera on its top and lay camera mounting plate on the camera, lining up the mounting holes. (Reference photo #2)
3. Install the four camera mounting screws (item #26) and hand tighten using 5/32" Allan wrench (item #29). (Reference photo #1)
4. With the camera still on it's top set the tractor over the camera mounting plate lining up the mounting holes. (Reference photo #2)
5. Install the two the 1" spacer mounting screws (item #24) and hand tighten using 5/16" Allen wrench (item # 30). (Reference photo #2)
6. Turn assembled unit to its upright position.
7. Locate the indexing notch on the camera power cable and align with the indexing tab on the bulkhead connector.
8. Insert the aligned connectors and carefully tighten the nut while gently rocking the connector to seat it for a watertight connection. (Reference page 9)

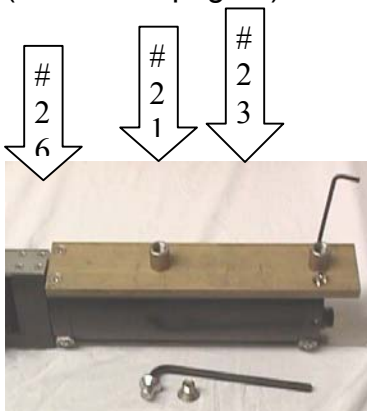


Photo 1

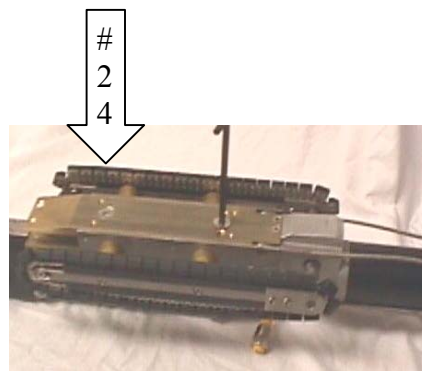


Photo 2

15" Line setup:

Tread drive assembly 15" setup:



The tracks are attached to the main body with the 3.18" long spacers.

With the tracks removed:

Set unit on its side.

Screw the studded end of the 3.18" long spacers (item # 9, 2 per side) to the tread drive mounting plates. Hand tight. (Reference photo #2)

Set the 3.18" long tractor drive extension (item # 5) on the drive axle, lining up the slot on the extension with the pin in the axle. (Reference photo #1)

Match the drive end of the tread drive assembly to the tractor drive extension.

Line up the mounting holes and attach the assembly with the 2 screws #25 (1/4-20X.62"). Then tighten with 3/16" Allen wrench # 28. (Torque to 150 inch pounds) (Reference photo #3) Repeat for other side.

To install camera reference page 9.



Photo 1

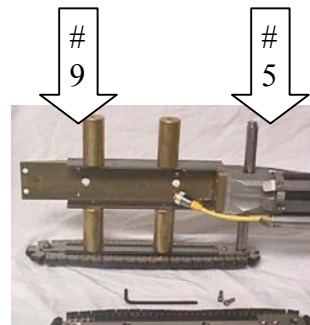


Photo 2

2nd #25 screw

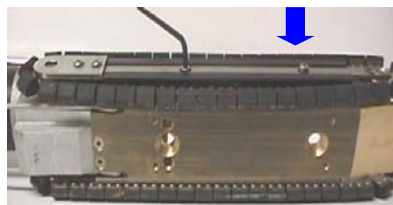
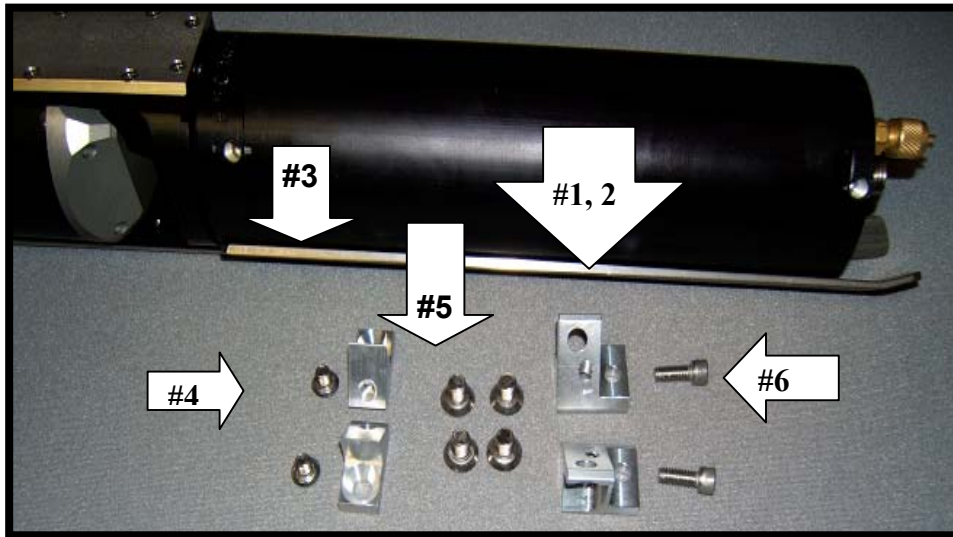


Photo 3

Omnistar camera to 6 inch crawler installation

The (*OPTIONAL*) installation kit to include:

#1	1 ea	451-34242	Right rear bracket
#2	1 ea	451-34243	Left rear bracket
#3	2 ea	451-34261	Front bracket
#4	4 ea	301-34287	1/4-20 x 3/8" undercut flat head screw
#5	6 ea	301-34290	5/16-18 x 1/2" undercut flat head screw
#6	3 ea	301-11005	1/4-20 x 5/8" socket head cap screw
#7	3 ea	301-11188	1/4-20 x 3/4" flat head screw
#8	3 ea	301-34289	1/4-20 x 1" flat head screw



TIP Use the camera riser plate as a fixture to align the mounting brackets, see Figure 4.

Installation to crawler base plate, 6 inch pipe inspection set-up

1. Use the 5/16-18 x 1/2" undercut flat head screws to mount the brackets onto the camera as shown in Figure 1.



Figure 1

2. Place the camera onto the crawler base plate. Use two 1/4-20 x 5/8" socket head cap screws to fasten the rear brackets to the base plate. Start the screws but do not tighten.

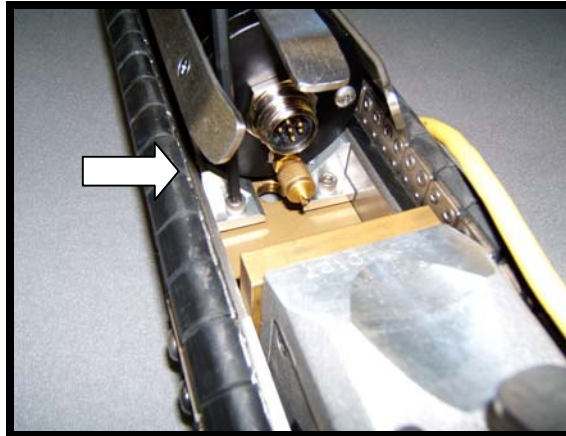


Figure 2

3. Place the crawler and camera on their backs. Use two 1/4-20 x 3/8" undercut flat head screws to fasten the front brackets to the base plate. Start the screws but do not tighten.

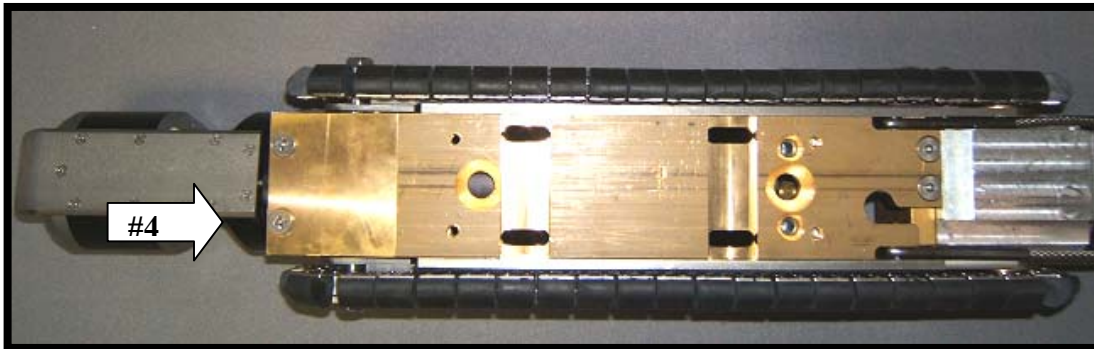
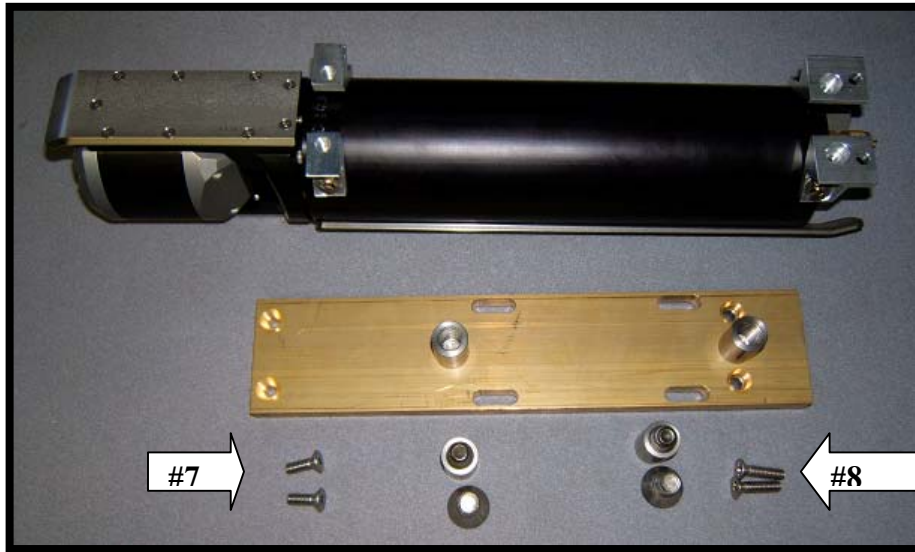


Figure 3

4. Carefully tighten the all screws. Make sure that the camera is seated flat against the base plate.

Installation to crawler camera riser plate, 8 to 15 inch pipe inspection set-up



1. Use the 5/16-18 x 1/2" undercut flat head screws to mount the brackets onto the camera as shown in Figure 1.
2. Place the camera on its back. Place the riser plate onto the camera. Use two 1/4-20 x 1" flat head screws to fasten the rear brackets to the base plate. Start the screws but do not tighten. Use two 1/4-20 x 3/4" flat head screws to fasten the front brackets to the base plate. Start the screws but do not tighten.

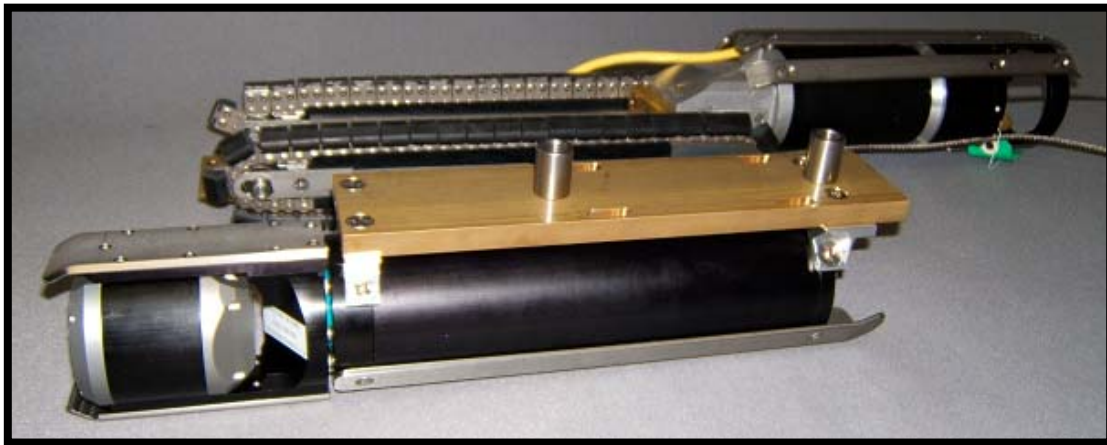


Figure 4

Carefully tighten the screws. Make sure that the camera is seated flat against the plate.

Cable Grip Adjustment

Check the cable grip for proper adjustment. If adjustment is needed:

Clean out the cap screws on the cable grip as well as the cable.

Loosen the four cap screws on the cable grip.

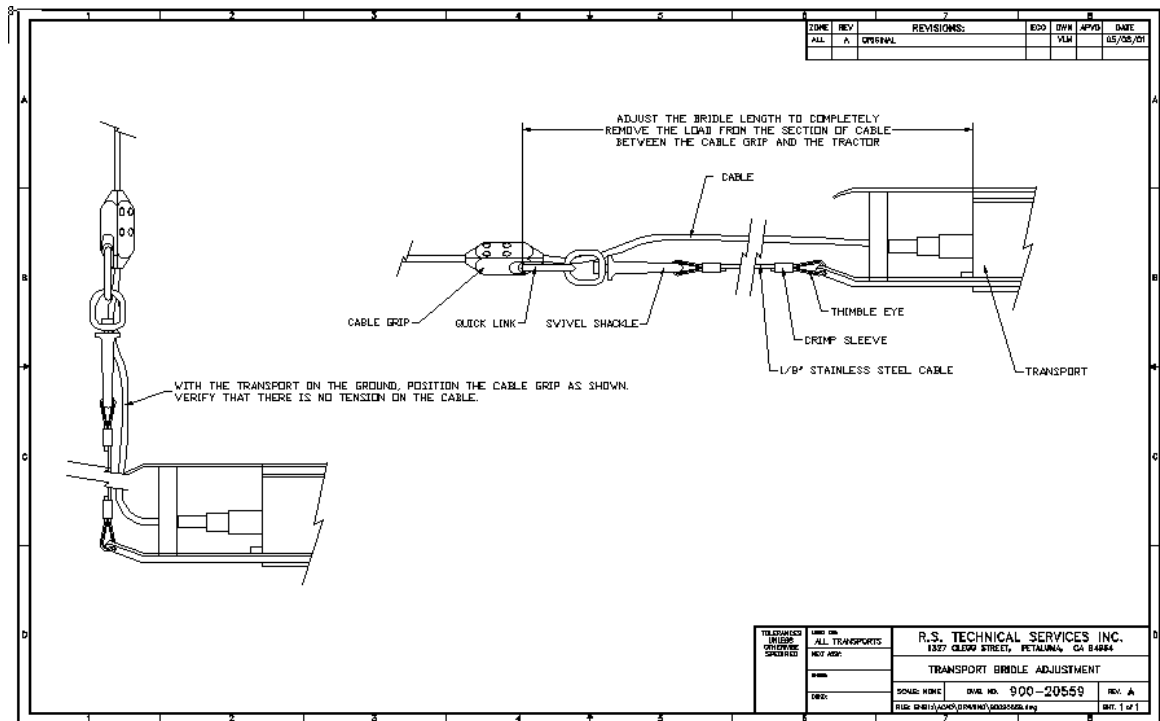
With the screws loose, it may be necessary to pop the cable grip on a hard surface to separate the halves from the cable.

Slide the cable grip to allow for proper slack. The cable grip should be adjusted to provide slack in the pigtail when the bridle is tight. There should be enough slack to allow the wire area to bend, but not enough to bend the boot area when the cable is raised at a 90-degree angle while loading and unloading the equipment.

Retighten the cap screws on the cable grip. The halves should be tightened evenly to prevent binding. Always use a cross pattern when tightening the cable grip.



WARNING! IMPROPER CABLE GRIP ADJUSTMENT IS ONE OF THE LEADING CAUSES OF PIGTAIL FAILURE!



Tread Drive Chain Adjustment

Loosen the idler sprocket nut and bolt using a 9/16" combo wrench.

Using a 5/64" Allen (item #31), back off the adjusting set screw. Slide the chain adjuster assembly forward until chain has no slack. (Reference photo #1)

Lift on the chain and insert a 5/16" Allen wrench (item # 30) between the chain and the chain guide. This will set the proper amount of slack for the chain. (Reference photo #2 and #3)

Hold the assembly steady with the 5/64" Allen wrench, tighten the bolt with the 9/16" wrench. (Reference photo #1 and #2)

Repeat for the other side. It is important that both sides are adjusted equally for the crawler to work properly.



Photo 1



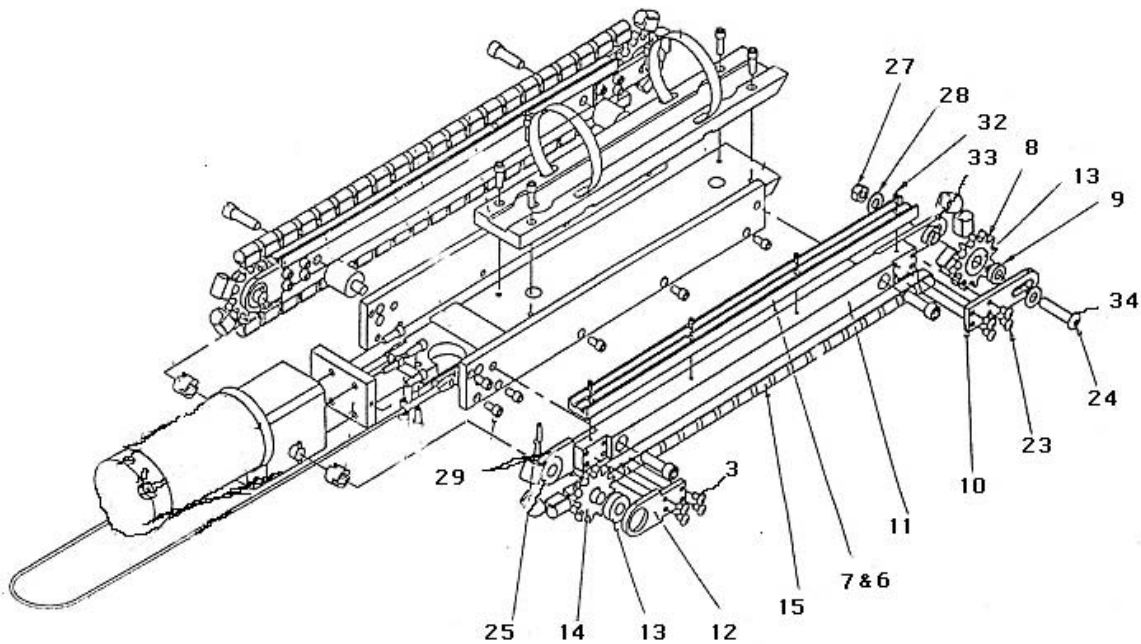
Photo 2



Photo 3

866-30378 Assembly, Tread drive, 6-15" Crawler

3	305-30380	MSCR, BUTTON, HXS, 1/4-20X.37	3.0 EA
6	449-30908	GUIDE, CHAIN, RIGHT OFFSET, 6"	1.0 EA
7	449-30908	GUIDE, CHAIN, LEFT OFFSET, 6"	1.0EA
8	441-30778	ASSY, SPKT, IDLER, TREAD DRIVE, 6"	1.0 EA
9	403-32624	SPACER, SPKT, FRONT, 6"	2.0 EA
10	453-32640	PLATE, OUTER,CHAIN TENSION ADJ, 6"	1.0 EA
11	451-32644	RAIL, TREAD DRIVE, 6"	1.0 EA
12	453-30591	PLATE, HOLDER, BEARING, OUTSIDE, 6"	1.0 EA
13	404-16026	BEARING,BALL,.875 OD,.375BORE,.28 W, SEALED	2.0 EA
14	805-30763-40	ASSY, SPKT/HUB, DRIVE, 6"	1.0 EA
15	867-30584	ASSY, CHAIN. TREAD DRIVE, 6"	1.0 EA
23	301-14610	MSCR,FLT,PHH,10-32X.50 SS	3.0 EA
24	305-32637	BOLT,CHAIN TENSION,6" CRAWLER	1.0 EA
25	145-072	BUSHING,REAR DRIVE, 6" MODIFY	1.0 EA
27	311-32638	NUT,ADJ,CHAIN TENSION	1.0 EA
28	448-32642	STOP,ADJ,CHAIN TENSION,6"	1.0 EA
29	453-32641	PLATE,BEARING,INNER,6"	1.0 EA
32	301-19936	MSCR, SHCS,6-32X.312 SS	6.0 EA
33	453-32639	PLATE, INNER,CHAIN TENSION ADJ, 6"	1.0 EA
34	304-13574	SSCR,CUP PT,HXS,8-32X.75 SS	1.0 EA



ASSEMBLY, TREADDRIVE, 6-15" CRAWLER 866-30378

Lowering Equipment into Pipeline

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. Follow cable grip, bridle, and watertight connection 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 lowering and lifting from 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

Put cable reel into “freewheel” and reel off enough cable so camera and crawler can be lowered into the bottom of the manhole. Place lowering rope ring under the top front runner or front of camera. Support weight of crawler and camera with the cable in one hand and rope in the other.

NOTE: RST skycrane can be used in place of the cable and rope method.

Slowly lower the front of camera into manhole to clear manhole ring. Lower crawler and camera to the bottom of manhole facing camera in the direction of the pipeline to be inspected. When crawler and camera are resting on bottom of manhole, release the rope ring and remove it from the manhole.

Check all camera and crawler functions again before proceeding. Move crawler forward so the rear of the crawler and the cable connections are fully inside the pipe. The use of guide poles with a hook will help to keep the crawler stable as it enters the pipeline.

Install the down hole pole, double roller, and top manhole roller. The use of double roller and/or single roller is for protecting the cable and allowing it to slide down the hole without drag on the line. Remove any slack from the cable and reset the footage counter. It is best to do this by hand or with cable reel set to low speed.

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

Retrieval of the Equipment

Ending the Run

Make sure crawler is in “free wheel”.
Use low speed while retrieving crawler.
Use care when removing camera from line.
Back crawler out of pipe into manhole so that front of crawler is clear of pipe.
Remove rollers and poles to make room to lift crawler and camera from manhole.
Lower rope with ring and catch the end of camera at the same place used to lower crawler and camera.
Lift crawler and camera assembly from manhole using the rope and cable.

NOTE: RST skycrane can be used in place of the cable and rope retrieval method.

Keep the camera clear of any ladders or drop lines.
When crawler and camera are out of hole:
Turn down light power on camera,
Turn off camera power,
Wash unit over hole,
Wipe down and store the cable, camera, and crawler.



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



**Caution: You must maintain control of the equipment at all times while loading and unloading.
Most equipment damage occurs when camera is loaded into the hole.**

Maintenance

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

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.