CUES

LAMP II

Lateral & Mainline Probe II

OPERATION & MAINTENANCE MANUAL

P/N LM903, Revision 19: 10.2026

REFER TO ADDENDUM P/N CMA00013-MAN FOR UPDATED REAR-VIEW CAMERA INSTRUCTIONS



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*REFER TO ADDENDUM P/N CMA00013-MAN FOR UPDATED REAR-VIEW CAMERA INSTRUCTIONS.

CUES® equipment is designed to be easy to use during day to day operation. However, it is powered electrically and thus must be operated with care and safety. PLEASE READ THE INFORMATION ON SAFETY AND MAINTENANCE EVEN IF THE SYSTEM IS SET UP BY SOMEONE ELSE.

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LAMPII INTRODUCTION

The self-propelled lateral inspection / pan and tilt mainline inspection system, referred to as LAMPII throughout the manual, is available in several different configurations.

CONFIGURATION LIST		
PART NUMBER	DESCRIPTION	STATUS
LM350	LAMP2,80'PSH CBL&SLF UPR/SND/NTSC	ACTIVE
LM350-2	LAMP2,ALT PSH DR,NO CAM&PSH CBL	ACTIVE
LM350-3	LAMP2,80'PSH,SLF UPR/SND,W/REAR CAM	OBSOLETE
LM350-4	LAMP2,ALT PSH,NO CAM&CBL,W/REAR CAM	OBSOLETE
LM350-5	LAMP2,ALT PSH,NO CAM&CBL,F/REAR CAM	ACTIVE
LM350-6	LAMP2,ALT PSH,LP&T,NO CAM&PSH CBL	ACTIVE
LM350-7	LAMP2,ALT,LP&T,NO CAM CBL,W/RV CAM	OBSOLETE
LM350-8	LAMP2,ALT,LP&T,NO CAM CBL,F/RV CAM	ACTIVE
LM350-9	LAMP2,ALT PSH,NO CAM&CBL,F/REAR CAM, PAL	ACTIVE
LM350-10	LAMP2,ALT,LP&T,NO CAM CBL,F/RV CAM, PAL	ACTIVE

This manual includes operating instructions for the LAMPII system. Equipment information is included in the *Equipment Overview* chapter in this manual.

The instructions in this manual are for multi-conductor inspection systems. The multi-conductor cable is approximately ½" in diameter and contains 8 to 12 conductors depending on the age of the system. Twelve conductors are required to operate the LAMPII system. If uncertain about the type of system, please call our Customer Service Department at 1-800-327-7791.

The LAMPII operates as part of any new or existing CUES multi-conductor system (including steerable). All existing CUES multi-conductor systems can be retrofitted to operate the LAMPII.

If the LAMPII is being installed on an existing TV only or TV seal system, modifications to the truck equipment layout and electrical wiring will be required. For more information, please call our Customer Service Department at 1-800-327-7791.

The LAMPII is designed to:

- Operate as one component of a multiconductor inspection system.
- Operate on up to 1000 feet of multi-conductor cable utilizing dual cable reels.
- Perform one-pass inspections of 6 through 36 inch mainline sewer pipes and house lateral pipes 3 - 8 inches in diameter.
- Display both lateral and mainline footage with picture in picture (PIP) capabilities.
- Optional Chute & Tube Kits are available to adapt the LAMPII to larger pipe diameters

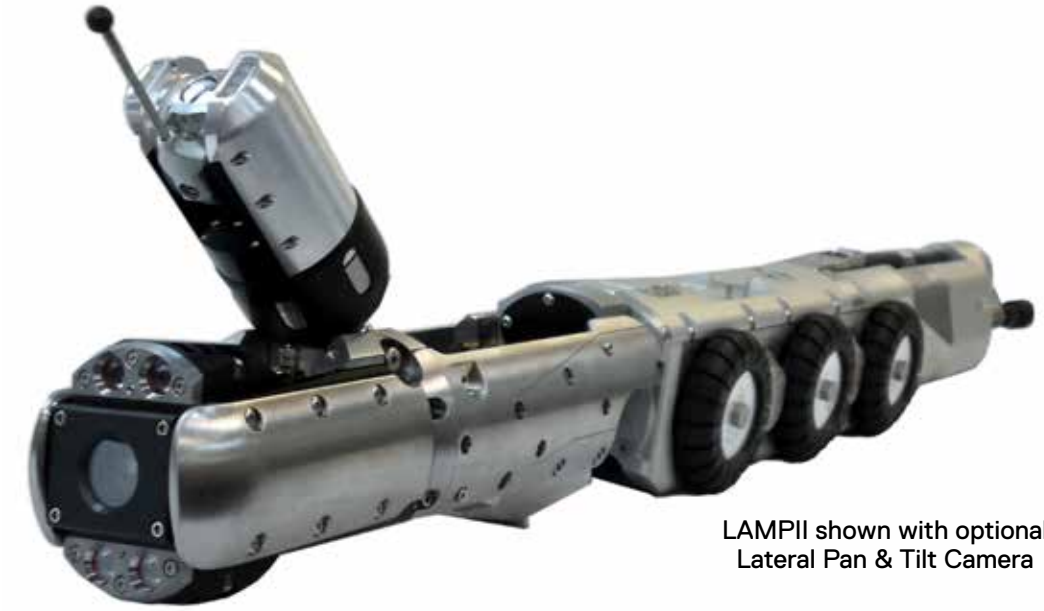


FIBERGLASS CABLE OPTION



LAMPII with LATERAL PAN & TILT CAMERA OPTION

2 SYSTEM DESCRIPTION



LAMPII shown with optional
Lateral Pan & Tilt Camera

The CUES LAMPII is designed to perform pan and tilt inspections of the mainline sewer pipe while viewing and inspecting:

- Stainless Steel Cable Option: up to 100 feet into a lateral pipe.
- Fiberglass Cable Option: up to 180 feet into a lateral pipe.

The LAMPII is able to accomplish this by integrating a self-propelled lateral launcher, transportation platform, and two cameras, one for pan, tilt, and optical zoom operations (mainline) and one for lateral launching. An optional Lateral Pan & Tilt Camera is available, but requires a specific LAMPII compatible unit.

The LAMPII is a variable weight, motorized, wheeled vehicle with integrated self-propelled lateral launcher and cameras for use in sewer pipelines up to 30" in diameter. The speed and direction of the transporter is controlled by the stand-alone, game pad, or wireless controllers (refer to the Functional Checkout section in this manual for more details).

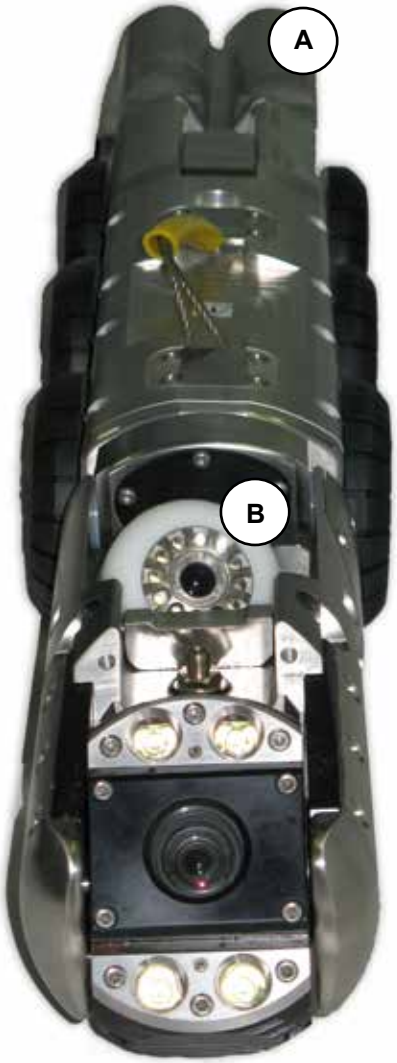
The mainline camera is located on the front of the LAMPII and is used to provide a 'pan, tilt, optical zoom' view of the mainline pipe, to locate laterals that are to be inspected, and to monitor the insertion of the lateral camera into the lateral. Since the mainline camera can locate house laterals from inside the mainline sewer pipe, the inspection can be carried out without any other access to the lateral being required.

The lateral camera is fixed to the push cable and is transported through the mainline sewer pipe in the LAMPII. After a lateral is located with the mainline camera, the launcher performs the necessary positioning functions to properly guide and direct the lateral launcher into the lateral service. To perform the lateral pipe inspection, the self propelled launcher extends and retracts the mini-camera and push cable into the lateral.

The optional CUES Lateral Pan & Tilt Camera (shown above) is designed to work with the LAMPII lateral launcher as an optional pan and tilt push camera. The camera is designed to navigate through multiple wyes and 45 and 90 degree bends / sweeps.

The inner core of the push cable not only transmits the power to the mini-camera and integral light ring, but also carries the video signal from the mini-camera to the truck. This ensures that the lateral inspections, as well as mainline inspections, are visible on the same video monitor located in the CUES multi-conductor inspection system (picture-in- picture capabilities - PIP). The lateral reel can retrieve the push cable as the push camera is retracted.

EQUIPMENT OVERVIEW



The LAMPII system consists of the following:

A LAMPII Transporter

- Self-propelled wheeled transporter
- Integrated pan/tilt/zoom (OZIII camera) mainline camera with LED lightheads and homing
- Integrated lateral push assembly (2-speed)
- Lateral footage encoder
- Built-in diagnostics

The LAMPII launcher is a wheeled transporter with integrated pan and tilt/zoom camera and lateral push cable assembly. The LAMPII lateral push cable assembly propels the small push camera from inside the mainline pipe into the lateral. The launcher is a wheeled transportation platform which transports the entire LAMPII system through the mainline sewer pipe. The integrated pan and tilt/zoom camera provides live video of the mainline sewer pipe inspections. The mainline camera is mounted on the front of the LAMPII transporter, which pans and tilts/zooms to monitor the insertion of the lateral camera and view the mainline pipe. The unit includes two LED lightheads on the camera to provide adequate lighting for a clear picture of the mainline and lateral pipelines. The camera head pivots for easy insertion into the pipe.

B Lateral Camera & Cable Assembly

- Self-upright camera with LED light-ring
- Camera centering ball
- Steel spring push cable (LM350 & LM350-3 with stainless steel cable option up to 100 ft)
- Fiberglass push cable (LM350-2 & -4 to -10 with fiberglass cable options up to 180 ft)
- Sonde (optional)

The lateral camera is fixed to the push cable (stainlees steel or fiberglass cable assembly, depending on your specific configuration) and is propelled into the lateral by the LAMPII push assembly. The mini-camera light ring contains (12) adjustable-intensity, light-emitting diodes. The camera centering ball protects the lateral camera and lighthead from offsets and in-line obstructions and helps negotiate bends during the pipe inspection. An optional sonde, built into the lateral mini-camera, is available to help accurately locate the camera in metallic and non-metallic pipes. The sonde can operate with any constant tone, 512Hz locator/receiver.

3 EQUIPMENT OVERVIEW CONTINUED

The LAMPII system consists of the following:



C Lateral Pan & Tilt Camera (optional)

- Rotation: Continuous 360 degree rotation
- Pan: Continuous 360 degree rotation
- Illumination: White LED Lighting
- Scratch-resistant sapphire window
- Detachable steering wand provides the ability to navigate through multiple wyes
- (2) camera lens window wipers included for in-pipe cleaning of windows. No need to pull out the camera above ground to clean the lens windows!
- Automatic, powered self-leveling camera head
- Four (4) banks of LED's with variable light intensity
- Push cable lengths available up to 180 ft.



For additional information regarding the Mini Pan & Tilt Camera, refer to P/N's UC912 - MINI PAN & TILT QUICK GUIDE and LM912 - K2/K3 LM2 MINI/MICRO P&T,QUICK CARD, for the following instructions:

- Guide Rod Installation
- Attaching the Camera to the Lateral Push Cable
- Installing or Replacing the Shroud
- Installing or Replacing the Spring
- Pressurizing the Camera

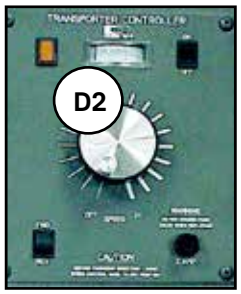
D Controllers

- Standard transporter controller
- LAMPII function controller (LM320)
- Lateral power control unit (LM341, LM342, LM354, LM355, LM356)
- Lateral reel controller
- Remote retrieve/release reel controller - LM353
- Game pad or CUES hand-held controllers - wireless or tethered

Controllers -
For systems using a 1208 PCU:
D1. Controller for the cameras and self propelled lateral launcher- The desktop controller is used to control the various movements of the LAMPII and the OZII and OZIII cameras.
D2. Controller for the transportation platform - This controller is used to control the direction and speed of the transportation platform for the launcher.

For K2 Summit Systems:
D3. K2 Summit Hand-held Controller - The ergonomic, hand-held, wireless controller is available for all camera, transporter, reel, LAMPII lateral launcher, and camera lift functions.
D4. K2 Summit Game Pad Controller - An optional wireless, compact controller is available for all camera, transporter, reel, LAMPII lateral launcher, and camera lift functions.





HAND-HELD K2 CONTROLLER

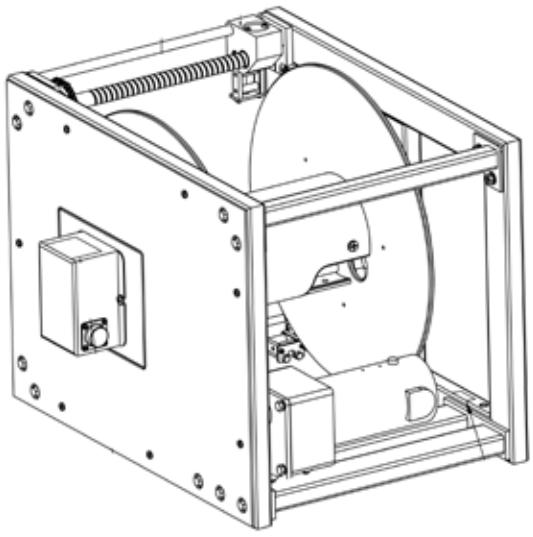


GAME PAD CONTROLLER



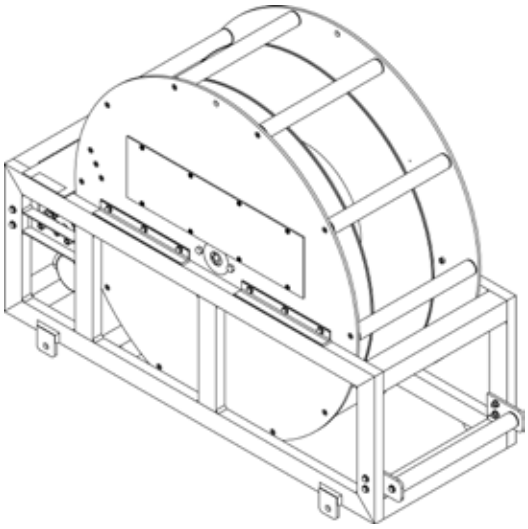
E **Lateral Reel -** The reel stores the lateral video cable and electrically retrieves the lateral cable upon completion of the lateral pipe inspection. It's controller is equipped with variable speed/force control. The new fiberglass cable reel will stow the lateral video cable and push cable.

- 1000ft lateral cable
- Integrated levelwind / auto-retrieve (levelwind available with the stainless steel cable option only)



Lateral Reel for the LAMPII
Lateral Push Cable - Spring Cable Configuration

E



Lateral Reel for Fiberglass
Push Cable Configuration

3 EQUIPMENT OVERVIEW CONTINUED

F All necessary interconnect cables (not shown)

G Optional Sonde & Receiver

H Optional Wheels Sets Available (refer to the information below and the Wheel Matrix in this document)



Optional Sonde & Receiver

Six tires and/or three wheel assemblies available in four different sizes (refer to the Wheel Matrix for more information) - The transporter utilizes six tires, six steel wheels, or four pneumatic wheel assemblies, depending on the transporter configuration for the pipe size to be inspected. The six tires/steel wheels are used in 6" - 36" pipe sizes. The pneumatic wheel assemblies are available to maximize traction in pipes ranging from 12"+ in diameter.

P/N LM935 (Kit, Adapter, K2 Wheels to LAMPII) is available when mounting the large 14" Pneumatic Wheels to the LAMPII.

* NOTE: tires are not to scale. Part numbers are referenced on the LAMPII Wheel matrix in this chapter.



(standard) for 6" Pipe



8" Pipe - Rubber



10" - 15" Pipe



Pneumatic for 12" +



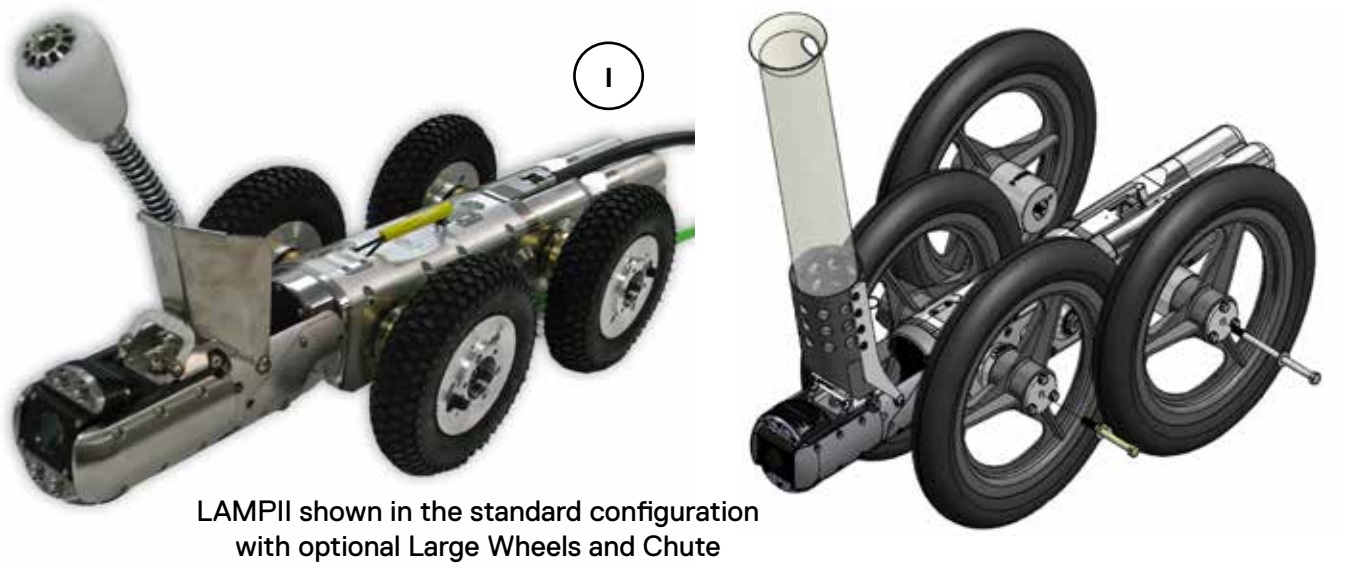
6" Lined Pipe



8" Pipe - Steel

* 6" steel and 10" - 15" rubber not shown

I Optional Chute & Tube Kits are available to adapt the LAMPII to larger pipe diameters



LAMPII shown in the standard configuration
with optional Large Wheels and Chute

LAMPII LARGE PIPE EQUIPMENT

To support large pipe inspections, modular chutes are available for LAMPII. The chutes are designed for use in pipe sizes ranging from 18 to 36 inches in diameter. Large 14" wheels are included in Kit P/N LM931, Angled Chute Kit, and can also be purchased separately. The large wheels are utilized to increase bottom clearance.

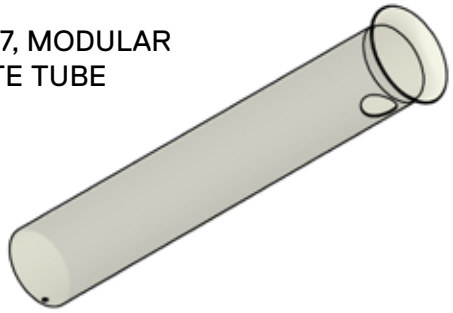
The chutes consist of a breech and of a set of three clear polycarbonate tubes, P/N LM297-1 through -4, for 18-36 inch pipes. The tubes are inserted and secured into the breech according to pipe size.

Two breeches are available: one straight, for use with the standard wheels, P/N LM362, and an angled one, P/N LM363, for use with the large wheels, P/N LM935. **Note: The Mini P&T Camera will not retract into the LAMPII cradle from the chute breech. When retrieved, it should remain in the chute breech.**

P/N LM935 (Kit, Adapter, K2 Wheels to LAMPII) is available when mounting the large 14" Pneumatic Wheels to the LAMPII.

For existing units, contact CUES Customer Service prior to installation to determine if the clutch is adjusted properly. Once this is accomplished, existing units can be field-retrofitted.

LM297, MODULAR
CHUTE TUBE



LENGTHS TABLE			
PART NUMBER	"L" ±.02	WEIGHT (REF)	PIPE SIZE
LM297-1	18 in	.45 lb	36 in
LM297-2	14 in	.35 lb	30 in
LM297-3	10 in	.25 lb	24 in
LM297-4	5.5 in	.14 lb	18 in

WHEEL MATRIX FOR LAMP II
Installation Configuration Matrix

	LAMP II Quick Change Wheel BOM Matrix 6"-15" PIPE												
	6" LINED RUBBER	6" RUBBER	6" STEEL	8" RUBBER	8" STEEL	10" RUBBER	10" STEEL	12" RUBBER	12" STEEL	15" RUBBER	15" STEEL	12" PNEU	15-18" PNEU
WHEEL/KIT Number	WM097	WM209	WM307-1	WM308	WS906	WM310	WM310-2	WM310	WM310-2	WM310	WM310-2	WM312	WM312
	(6 ea.)	(6 ea.)	(6 ea.)										
SPACER	--	--	--	WM058	WM058	WM061	WM061	WM058	WM058	WM061	WM061	--	WM058
				(6 ea.)	(6 ea.)	(6 ea.)	(6 ea.)	WM061	WM061	(6 ea.)	(6 ea.)		WM061
								(6 ea.)	(6 ea.)				(4 ea.)
CHUTE KIT				LM902	LM902	LM902	LM902	LM902	LM902	LM902	LM902	LM902	LM902
CHUTE				LM143	LM143	LM144	LM144	LM145	LM145	LM146	LM146	LM145	LM146
ATTACHMENT SCREW	WM098-1	WM098-1	WM098-1	WM099-1	HW2819	HW1567	HW1567	HW1568	HW1568	HW1569	HW1569	HW1568	HW1570
	(6 ea.)	(6 ea.)	*(included in kit)*	*(included in kit)*	*(included in kit)*	1.5" Length	1.5" Length	2.0" Length	2.0" Length	2.5" Length	2.5" Length	2.0" Length	3.5" Length
NOTES:	*Captive Screw*	*Captive Screw*	*Captive Screw*	*Captive Screw*	*Captive Screw*	*Screw included in WM317 kit*	*Screw included in WM317 kit*	*Screw included in WM317 kit*	*Screw included in WM317 kit*	*Screw included in WM317 kit*	*Screw included in WM317 kit*	*Screw included in WM317 kit*	*Screw included in WM317 kit*



	18-36" STANDARD WHEELS AND STRAIGHT CHUTES				
	18"	21"	24"	30"	36"
CHUTE KIT Number	LM932	LM932	LM932	LM932	LM932
CHUTE TUBE	LM297-4	LM297-3	LM297-3	LM297-2	LM297-1
WHEEL	WM312	WM312	WM312	WM312	WM312
SPACER	WM058		WM058	WM058	WM058
	WM061		WM061	WM061	WM061
	(4 ea.)		(4 ea.)	(4 ea.)	(4 ea.)
ATTACHMENT SCREW	HW1570	HW1570	HW1570	HW1570	HW1570
	3.5" Length	3.5" Length	3.5" Length	3.5" Length	3.5" Length
	Screw included in WM317 kit	Screw included in WM317 kit	Screw included in WM317 kit	Screw included in WM317 kit	Screw included in WM317 kit
NOTES:	CHUTES WILL NOT CLEAR LARGE 14" WHEELS				





	24-36" MODULAR TUBE LARGE 14" WHEEL ANGLED CHUTES		
	24" K2	30" K2	36" K2
CHUTE KIT Number	LM931	LM931	LM931
CHUTE TUBE	LM297-3	LM297-2	LM297-1
WHEEL	LM935	LM935	LM935
	LM294-1	LM294-1	LM294-1
SPACER	LM294-2	LM294-2	LM294-2
	(2 ea.)	(2 ea.)	(2 ea.)
ATTACHMENT SCREW	HW2405/HW2475	HW2405/HW2475	HW2405/HW2475
	(included in kit)	*(included in kit)*	*(included in kit)*
NOTES:			

	21-24" STANDRARD WHEELS AND ANGULED CHUTES	
	21"	24"
CHUTE KIT Number	LM931	LM931
CHUTE TUBE	LM297-4	LM297-3
WHEEL	WM312	WM312
SPACER	WM058	WM058
	WM061	WM061
	(4 ea.)	(4 ea.)
ATTACHMENT SCREW	HW1570	HW1570
	3.5" Length	3.5" Length
	Screw included in WM317 kit	Screw included in WM317 kit



Note: When setting up for relined pipe select configuration for next smallest pipe and add 6x WM223 wheel spacers (included in WM317).
Use WM224-1 screws for 7in pipe setup.

TITLE:	INST SHEET,WHEEL MATRIX, LAMP2				
DWG NO:	LM907-INST		DFTR:		DATE:
ECN:	14454		CHKR:		DATE:
PRODUCT:	LAMP II		ENGR:	PS	DATE: 11/24/2020
NEXT ASSY:	LM900		MFG:		DATE:

WHEEL MATRIX FOR LAMP II
Installation Configuration Matrix

Kit No.	*Qty.*	*Part Number*	*Nomenclature*
WM307-1	6 ea.	WM096-1	Wheel, Steel, 6" Pipe
WM308	6 ea.	WM089	Hub, Inner, 8-15"
(8" pipe)	6 ea.	WM090	Hub. Outer, 8"
	6 ea.	WM092	Tire, Rubber, 8" Pipe
	12 ea.	WM099-1	Screw, Captive, BHCS, 5/16-24UNF x 1.000
	18 ea.	103052	Screw, Flat, Phillips, 10-32UNF x 1/2
WM906	6 ea.	WS112-1	Wheel,Steel,8" Single Pt 10/12 Grit
(8" pipe)	(included)	HW2819	Screw,Hex,5/16-24X1,17-4PH SST
WM310 / WM310-2	6 ea.	WM089	Hub, Inner, 8-15"
(10-15" pipe)	6 ea.	WM091	Hub, Outer, 10-15"
	6 ea.	WM093	Tire, Rubber, 10-15" Pipe
	6 ea.	WM108-1	Wheel, Steel, 10-15" Pipe
	18 ea.	102001	SCREW,CAP,SKT HD,10-32X1/2,SST
WM312	4 ea.	WM100	Adapter, Hub, Pneu. Wheels
(pneu. 12-15" pipe)	4 ea.	WT331	Pneumatic Wheel Assy
WM317	6 ea.	WM058	SPACER,.5",QUICK CHANGE,CPR,BRASS
(6-15" pipe)	12 ea.	WM061	SPACER,1",QUICK CHANGE,CPR,BRASS
CPR & WTR3	6 ea.	WM223	SPACER,.25,QUICK CHANGE,CPR/LAMPII
	6 ea.	WM224-1	SCREW,CAPTIVE,HEX,5/16-24 X .75
	12 ea.	HW1567	SCREW,SHCS,5/16-24UNF X 1.50,SS
	12 ea.	HW1568	SCREW,SHCS,5/16-24UNF X 2.00,SS
	12 ea.	HW1569	SCREW,SHCS,5/16-24UNF X 2.50,SS
	8 ea.	HW1570	SCREW,SHCS,5/16-24UNF X 3.50,SS
	1 ea.	WM902-INST	INST SHT,WHEEL MATRIX, CPR

Kit No.	*Qty.*	*Part Number*	*Nomenclature*
LM931	1	LM363	CHUTE ASSY,MODULAR,ANGLED,14" WHEEL
(21-36" pipe)	1	LM297-1	TUBE,POLYCARB,MOD CHUTE,18"L
	1	LM297-2	TUBE,POLYCARB,MOD CHUTE,14"L
	1	LM297-3	TUBE,POLYCARB,MOD CHUTE,10"L
	1	LM935	KIT,ADAPTER,14" PNEU WHEELS,LAMP II
	1	LM931-INST	INST SHEET,MOD,WHL/ANG CHUTE,24-36"
	1	LM297-4	TUBE,POLYCARB,MOD CHUTE,5.5"L

Kit No.	*Qty.*	*Part Number*	*Nomenclature*
LM935	4ea.	MD046	Wheel Assy, Pneumatic, 14"
(24-36" pipe)	2ea.	LM294-1	Spacer,Adapter, Inner, K2 Wheels
(part of LM931)	2ea.	LM294-2	Spacer,Adapter, Outer, K2 Wheels
	2ea.	LM295-1	Plate, Retaining, Inner, K2 Wheels
	2ea.	LM295-2	Plate, Retaining, Outer, K2 Wheels
	2ea.	HW2475	Screw, Hex, 5/16-24, Mod
	2ea.	HW2405	Screw, Hex, 5/16-24 x 3 1/4, Zn Pl
	12ea.	HW2407	Screw, Hex, M6 x 75mm, Zn Pl
	12ea.	HW1738	Washer, Flat, m6 x Ø12 x 1.5mm SST
	4ea.	101741	Washer, Flat, 5/16, SST

Kit No.	*Qty.*	*Part Number*	*Nomenclature*
LM932	1	LM362	CHUTE ASSY,STRAIGHT,LRG PIPE
(18-36" pipe)	1	LM297-1	TUBE,POLYCARB,MOD CHUTE,18"L
	1	LM297-2	TUBE,POLYCARB,MOD CHUTE,14"L
	1	LM297-3	TUBE,POLYCARB,MOD CHUTE,10"L
	1	LM297-4	TUBE,POLYCARB,MOD CHUTE,5.5"L

4 SYSTEM SET-UP & INSTALLATION

ADAPTING THE LAMPII TO DIFFERENT PIPE CONFIGURATIONS

The adaptation of the LAMPII to different pipe sizes is accomplished by changing the wheels. The wheel sets adjust to allow for the inspection of 6" through 36" diameter pipelines. This is accomplished by adding various types and quantities of wheels and spacers. The wheels and spacers not only widen the base of the transportation platform for stability, but also positions the LAMPII approximately in the center of the pipe for optimum viewing.

The LAMPII incorporates the new ***quick-change*** wheel assemblies that are designed for maximum efficiency and ease-of-use.

To remove the wheels:
IMPORTANT! When changing wheels, always apply anti-sieze compound, P/N CS407 or P/N 940700 grease, to all screw threads.

1. For 6" rubber and steel wheel assemblies, loosen the large center captive screw using a socket. For 8" - 15" wheel assemblies, loosen and remove the large center screw using an Allen wrench.
2. Separate the wheel assembly and spacer, if applicable, from the shaft.
3. For 24" - 36" wheel assemblies, refer to the instructions in P/N LM931-INST for more information.

To mount the wheels:

4. Select the appropriate wheel, spacer, and screw, if applicable, for the pipe size to be inspected. If necessary, refer to the wheel matrix shown in the previous chapter.
5. Install the spacer, ensuring that the tri-lobe pocket on the spacer is aligned with the tri-lobe on the shaft.
6. Hold the wheel and spacer against the LAMPII shaft and secure the appropriate screw using an Allen wrench.
7. Tighten to 15 ft. lbs.

IMPORTANT!

When changing wheels, always apply anti-sieze compound, P/N CS407 or P/N 940700 grease, to all screw threads!

CONNECT THE LAMPII TO THE TRUCK AS FOLLOWS:

Connecting the multi-conductor mainline cable:

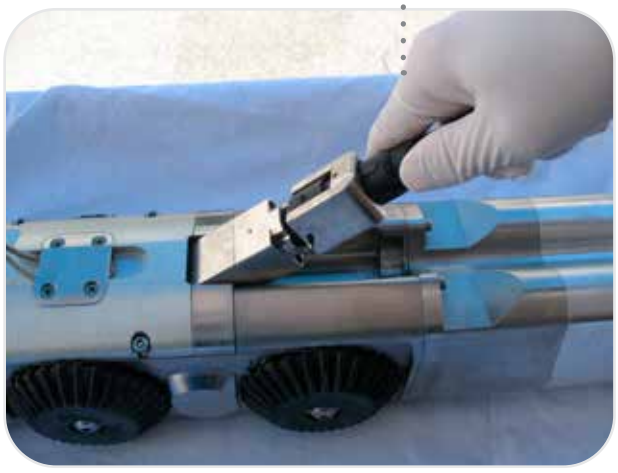
1. Attach the quick-connector (P/N LM074) to the end of the 12-pin gold cable.





2. Connect the multi-conductor gold cable to the top of the LAMPII, ensuring that the quick-connector is secure.

Note
the orientation of the top-conductor position for proper connector alignment.





SYSTEM SET-UP & INSTALLATION

CONNECT THE LAMPII TO THE TRUCK - CONTINUED:

3. Attach the tow cables to the strain relief on the gold cable, ensuring that the gold cable has at least 3" - 4" of slack when the tow cables are taut.





NOTE: Tow Cable P/N LM157 is recommended for use when the rear viewing camera is not used. Tow Cable P/N LM388 is recommended when the rear viewing camera is used. Tow Cable P/N LM388 has an extra loop which captures the rear view camera. Refer to the RVC installation instructions in this chapter for further details.

INSTALL THE PUSH CABLE

Refer to the Stainless Steel or Fiberglass Cable instructions in this section, depending on your specific configuration.

If you have the fiberglass push cable assembly, refer to the next procedure for installation instructions.

For Stainless Steel Push Cable Assemblies:

1. Lay out the push cable and install the camera and centering ball.



2. Pivot the camera head UP and insert the push camera up through the bottom of the unit as shown.

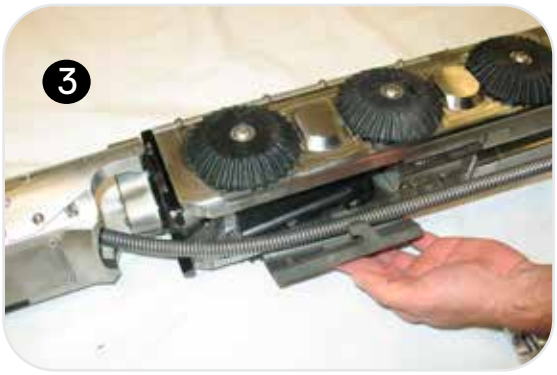


FOR STAINLESS STEEL PUSH CABLE ASSEMBLIES ONLY:

3. Guide the cable into the channel and install the guide plate to capture the push cable.

4. To install the pressure plate, apply blue threadlocker to all screw threads and secure the screws. Adjust the set screw on the pressure plate to provide the lightest possible pressure against the cable.

5. Turn ON the reel controller and set to REAR and RELEASE. Ensure that the cable easily unrolls from the reel.





SPEED AND FORCE ADJUSTMENT -
Spring Push Cable System:

To ensure the lateral cable unrolls easily, perform the following:

- When driving the launcher forward or extending the lateral camera, the lateral reel RETRIEVE/ RELEASE switch must be set to RELEASE - or -
- the lateral reel controller power switch must be in the OFF position



When retracting the lateral camera:

- Ensure that the lateral reel RETRIEVE/RELEASE switch is set to RETRIEVE.
- Adjust the SPEED/FORCE knobs clockwise to the desired position.
- Recommended initial settings: SPEED: 12 o'clock FORCE: 1 o'clock

When pulling the launcher backwards:

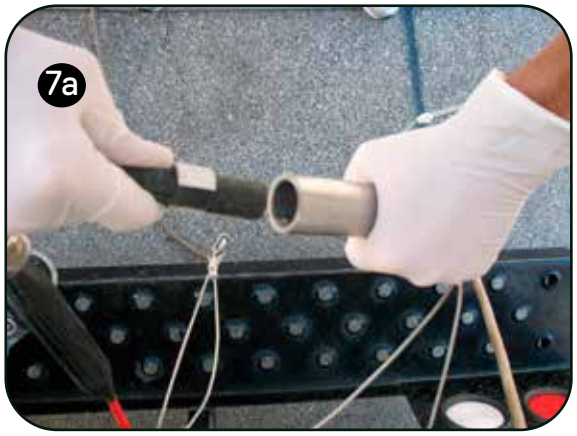
- Ensure that the lateral reel RETRIEVE/RELEASE switch is set to RETRIEVE.
- Adjust the SPEED/FORCE knobs clockwise to the desired position to keep up with the gold cable speed.
- Recommended initial settings: SPEED: 12 o'clock FORCE: 1 o'clock
- Retrieval speed will vary depending on the pipe condition and wheel configuration.
- To prevent the transporter from driving over the cables and hindering retrieval, use caution and do not allow the transporter to track faster than the lateral reel.
- Recommended settings: Gold Cable retrieval speed should be set according to pipe conditions with cables visually monitored for synchronization to prevent potential damage to the equipment.

CONNECT THE LAMPII TO THE TRUCK - CONTINUED:



FOR STAINLESS STEEL PUSH CABLE ASSEMBLIES ONLY:

6. Route the lateral camera cable through the cable guides.



7. Connect the lateral camera cable to the metal push cable:

   a. Align the pins of the lateral camera cable connector with those of the metal push cable and connect them. Push until the ends pop together.



   b. Install the spacer in the chamber before installing the nut.

      Apply anti-sieze compound, P/N CS407 or P/N 940700 grease, and then tighten the metal chamber nut (do not cross-thread).

   c. Connect the strain relief cables.



REMOTE REEL CONTROLLER (RETRIEVE / RELEASE) INSTRUCTIONS -

A remote desktop controller is available for both LAMPII lateral reels. This controller allows switching the reel between release and retrieve without having to stand up to use the switch on the lateral PCU. With this device, the operator can choose to use the switch on the desk or the one on the PCU.

This controller does not overide the functions on the lateral reel controller or replace the button on the PCU or at the reel controller.

POWER LED - INDICATES THE CONTROLLER IS PLUGGED-IN TO THE LATERAL PCU. NOTE: THE CONTROLLER IS ALWAYS ACTIVE REGARDLESS OF THE LATERAL PCU BEING ON OR OFF.



CONTROL LED - INDICATES THE LOCAL/REMOTE SWITCH IS SET TO "LOCAL".

REEL LED - INDICATES THE RETRIEVE/RELEASE SWITCH IS SET TO "RETRIEVE" WHEN IN "LOCAL" CONTROL.

REEL TOGGLE SWITCH: PRESS TO RELEASE OR RETRIEVE THE CABLE ON THE REEL.

CONTROL TOGGLE SWITCH: PRESS TO SELECT LOCAL (HAND-HELD CONTROLLER) OR REMOTE CONTROLLER (LATERAL PCU).

P/N LM353, CONTROLLER, REMOTE, RETRIEVE/RELEASE, LAMPII REEL

4 SYSTEM SET-UP & INSTALLATION

Ensure that the grey/yellow cable is plugged into the rear of the Lateral PCU as shown below.

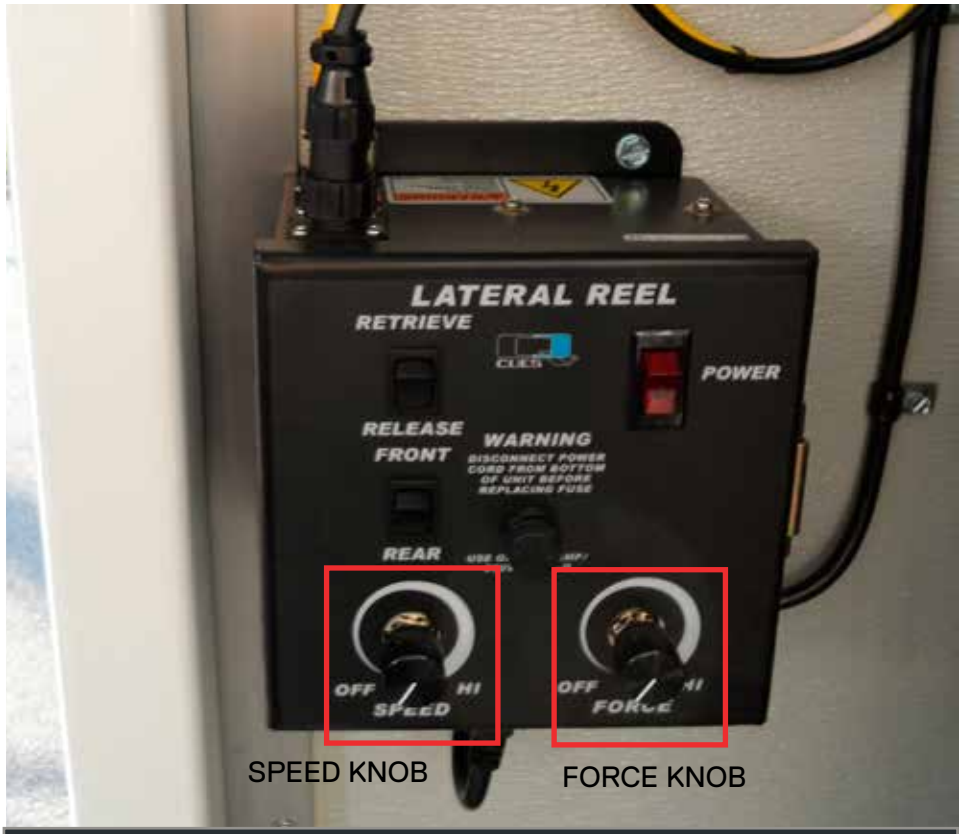




REMOTE REEL CONTROLLER IN THE CONTROL ROOM

REMOTE REEL CONTROLLER (RETRIEVE / RELEASE) INSTRUCTIONS -

1. All settings for SPEED and FORCE must be set at the rear reel controller.
2. When in the Control Room, the operator can only control the RET/REL functions on the lateral reel.
3. Ensure the rear reel controller switch is set to FRONT to use either the hand held controller or the lateral reel switch on the Lateral PCU.
4. When the operator is in LOCAL CONTROL when using the hand-held controller, the lateral reel switch on the Lateral PCU will become disabled.



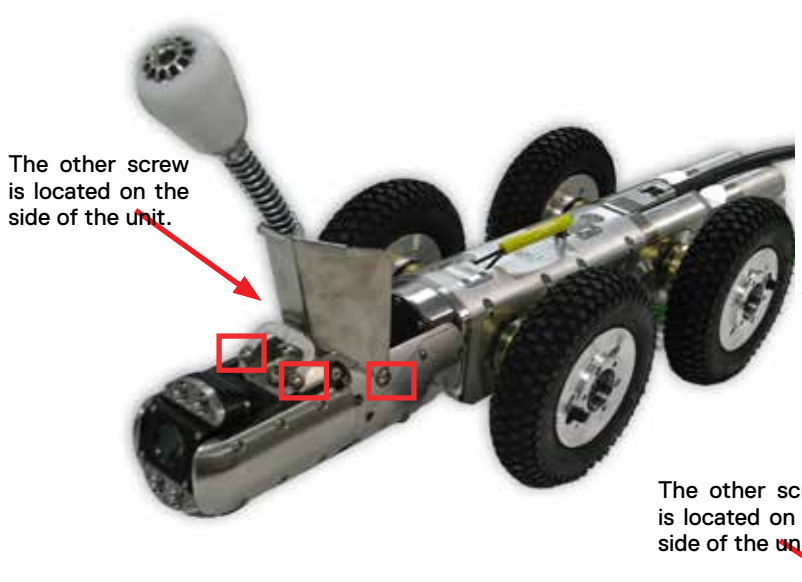
LATERAL REEL CONTROLLER AT REAR OF TRUCK

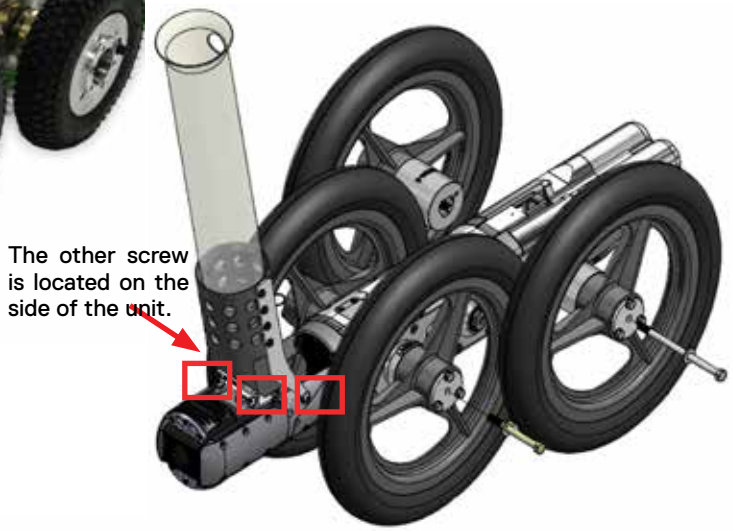
4 SYSTEM SET-UP & INSTALLATION

TO INSTALL THE CHUTE AND WHEELS PER P/N LM931-INST -

1. All chutes are fastened with (4) screws (in RED below) using a Phillips Head screwdriver.
2. Once fastened in place, the large pipe chutes, P/N LM362 or LM363, will be ready to receive the tube, P/N LM297, for the appropriate pipe size to be inspected.
3. Slide the tube into the breech of the chute, aligning the hole in the tube with the pull ring of the pin while pulling it and releasing it when the tube has reached the bottom. Turn the tube until the detent is heard.
4. When using the large 14" diameter wheels: In order to avoid flipping over, place the wheels with the thinner spacer on the front axle of the unit.

NOTE: Refer to the Wheel Matrix in this manual for the appropriate chute to use.
NOTE: The (4) screws and locations (in RED below) are the same for each configuration.







FOR FIBERGLASS PUSH CABLE ASSEMBLIES ONLY:

Attach the Spring End to the Push Cable:

NOTE: Prior to mating the cable, ensure that both internal and external threads are clean of any debris, and then lubricate with anti-seize, CUES P/N #940700.

1. Align the visual markers and guide pins and mate the connector ends together.





2. Thread the spring end nut completely, ensuring the o-ring is covered and no physical play can be felt between the ends.

   Note: Ensure that alignment between the connectors is maintained while threading. Permanent damage may occur if fastened while misaligned.



3. Tighten with a wrench.



4. Snap the C-Clip over the flats between the nut and spring where shown.

   NOTE: The C-Clip must be removed in order to disassemble the spring adapter from the push cable.





4 SYSTEM SET-UP & INSTALLATION

If you have the stainless steel push cable assembly, refer to the previous procedure for installation instructions.

FOR FIBERGLASS PUSH CABLE ASSEMBLIES ONLY:

4. Snap the C-Clip over the flats between the nut and spring where shown.

   NOTE: The C-Clip must be removed in order to disassemble the spring adapter from the push cable.



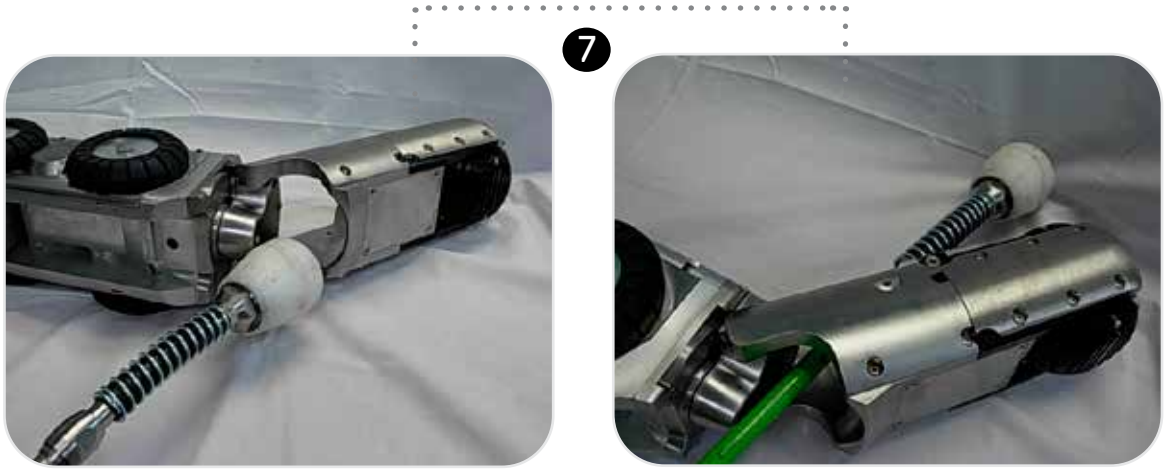


5. Turn ON the reel controller and set to REAR and RELEASE. Ensure that the lateral cable easily unrolls from the reel.
6. Pull out some of the push cable and install the camera and centering ball.

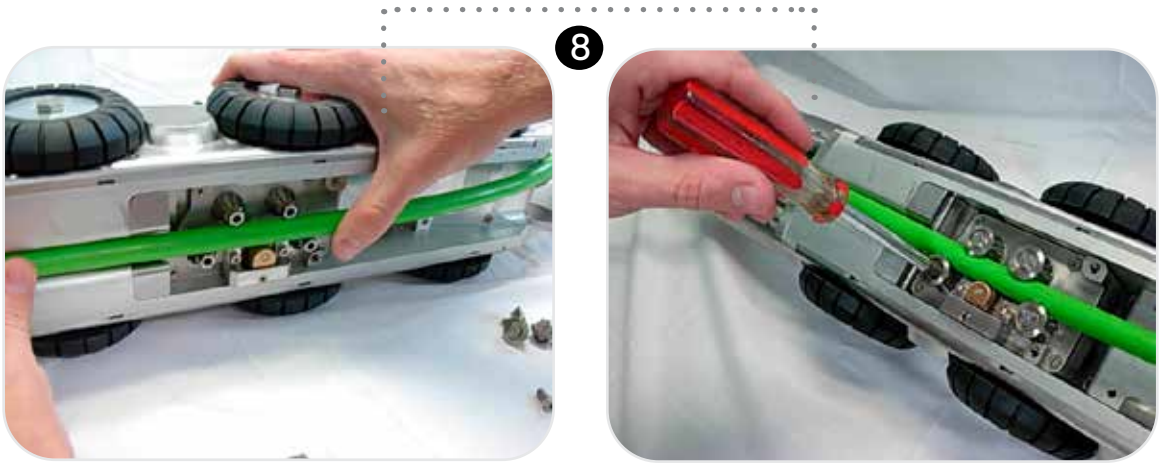




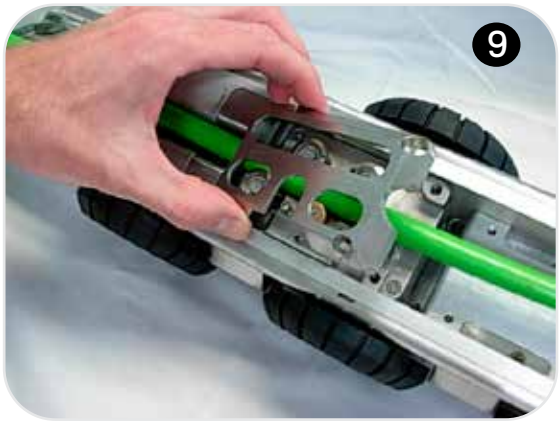
7. If using the Self-upright Lateral Camera, pivot the camera head UP and insert the push camera up through the bottom of the unit as shown. If using the Mini Pan & Tilt Camera, install the push cable into the LAMPII prior to installing the camera (not shown).



8. Pivot the camera head up and insert the push camera up through the bottom. Guide the cable into the channel and install four (4) push wheel tops with blue thread locker. Torque to 24 in-lbs. Let the thread locker set for 30 minutes before operating. NOTE: The push wheel screws should be checked prior to each use to ensure proper tension.



9. Place blue thread locker on the screws and secure the cover plate.

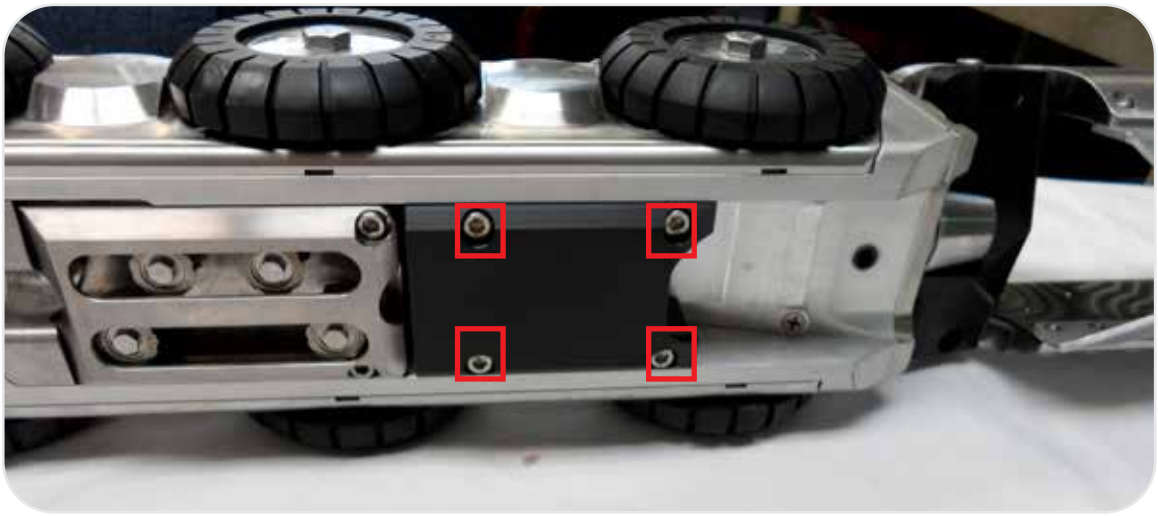


WHEN USING THE MINI P&T CAMERA COMPATIBLE LAMPII VERSION:

If using the CUES Mini Pan & Tilt Camera with the LAMPII, perform the steps listed in the previous procedure as well as the following:

To uninstall and/or reinstall the push cable when using the Mini Pan & Tilt Camera compatible LAMPII version, it's necessary to remove and/or install the underbody push cable guide, P/N LM730, as follows:

1. Using an Allen Wrench, remove the (4) screws located on the cable guide.
2. Install the push cable per the previous procedure: Install the push cable into the LAMPII prior to attaching the camera (not shown).
3. Always apply blue thread locker, P/N CS036, to screws prior to re-installation. Using an Allen Wrench, reinstall the (4) screws.



SPEED AND FORCE ADJUSTMENT: Fiberglass Push Cable System

To ensure the lateral cable unrolls easily, perform the following:

- When driving the launcher forward or extending the lateral camera, the lateral reel RETRIEVE/RELEASE switch must be set to RELEASE - or -
- the lateral reel controller power switch must be in the OFF position

When retracting the lateral camera:

- Ensure that the lateral reel RETRIEVE/RELEASE switch is set to RETRIEVE.
- Adjust the SPEED/FORCE knobs clockwise to the desired position.
- Recommended initial settings: SPEED: 3 o'clock FORCE: 9 o'clock

When pulling the launcher backwards:

- Ensure that the lateral reel RETRIEVE/RELEASE switch is set to RETRIEVE.
- Adjust the SPEED/FORCE knobs clockwise to the desired position to keep up with the gold cable speed.
- Recommended initial settings: SPEED: 3 o'clock FORCE: 9 o'clock
- Retrieval speed will vary depending on the pipe condition and wheel configuration.
- To prevent the transporter from driving over the cables and hindering retrieval, use caution and do not allow the transporter to track faster than the lateral reel.
- Recommended settings: Gold Cable retrieval speed should be set according to pipe conditions with cables visually monitored for synchronization to prevent potential damage to the equipment.

WHEEL KIT CONFIGURATION TABLE	
KIT P/N	DESCRIPTION
LM919	KIT,STD PUSH WHEELS,ALT,LAMPII
LM920	KIT,LARGE PUSH WHEELS,ALT,LAMPII

IMPORTANT NOTES FOR THE LM920 WHEEL KIT (for use with fiberglass push cable assemblies only):

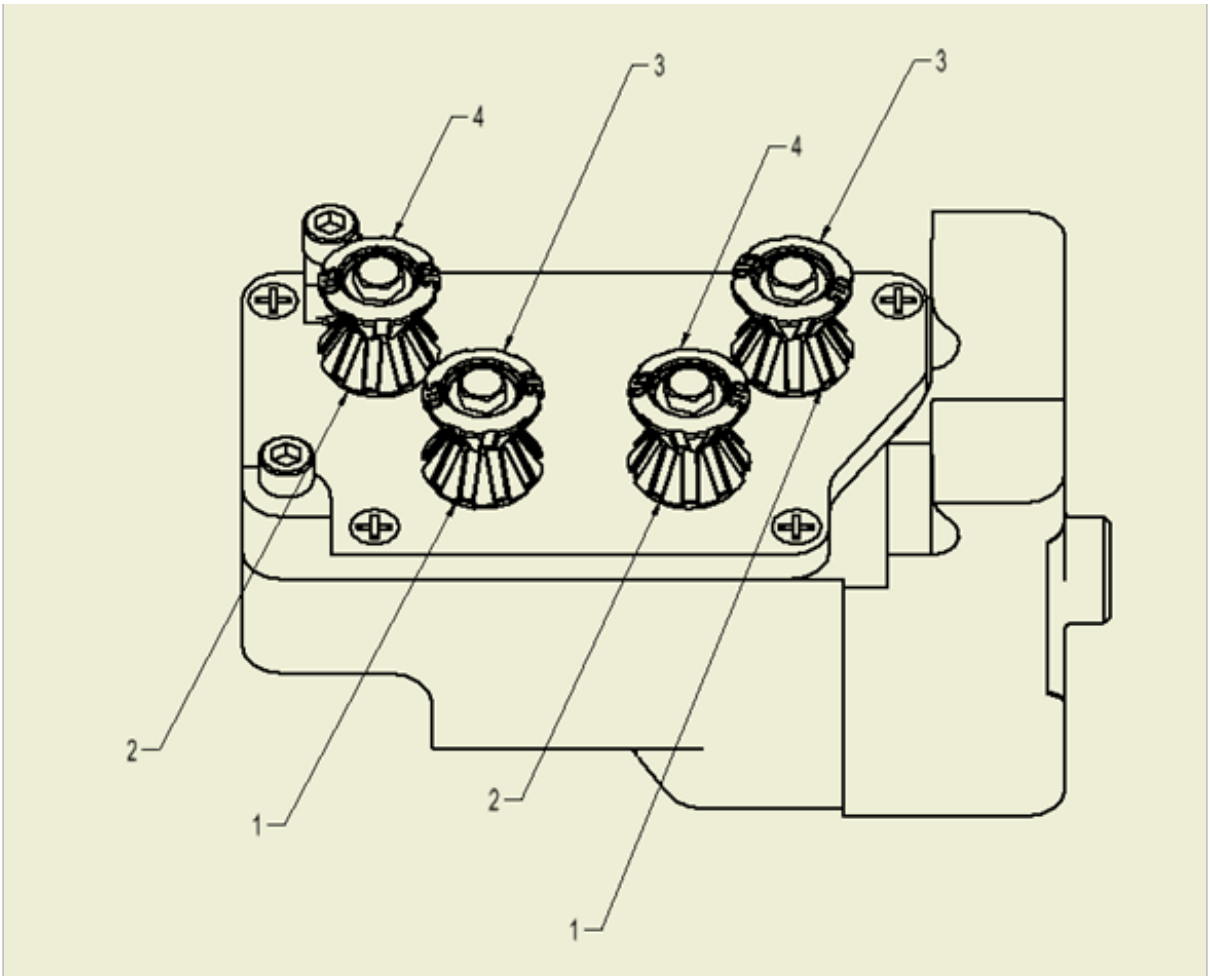
- The LM920 wheel kit is available to optimize push drive performance and extend cable life for fiberglass core lateral push cable systems.
- The larger push drive wheels are identified by 'O/S' (oversize) markings on the top or bottom face for the top and bottom rollers, respectively.
- The LM920 wheel kit should never be used with new cable or cable that has not been reversed to ensure wear consistency. Improper use of the wheel kit may result in reduced push drive performance or failure.
- Prior to installation of the LM920 wheel kit, the lateral push cable should be reversed, swapping the camera and reel ends, to ensure that wear is consistent throughout the length of the cable.
- LM920 BOM and exploded view drawings are included in Chapter 7.

LAMP II PUSH WHEEL REPLACEMENT GUIDE

Due to normal wear and tear, the plastic push cable may begin to slip during operation. To compensate for this, CUES offers three different push wheels in various sizes. As the cable begins to wear, follow the steps below and the diagram on the opposite page to change the push wheels to the next set of larger wheels. Start with the standard wheels, then move to the oversized wheels, and finally move to the double-oversized wheels.

Note: Top and bottom orientations are for the push block, which sits upside-down in the LAMP II.

1. Replace the bottom wheels on the corners as indicated. Refer to the image on the opposite page. Push wheels are labeled per each applicable step that requires a change. Each step involves changing two push wheels. Reinstall the push cable and operate the LAMP II in this configuration until cable slippage starts and then proceed to next step.
2. Replace the bottom wheels on the other two corners. All bottom rollers are now the larger size and all top rollers are the smaller size. Reinstall the push cable and operate the LAMP II in this configuration until cable slippage starts and then proceed to next step.
3. Replace the top wheels on the two corners as indicated. Reinstall the push cable and operate the LAMP II in this configuration until cable slippage starts and then proceed to next step.
4. Replace the top wheels on the other two corners. Now all push wheels have been changed. Reinstall the push cable and operate the LAMP II in this configuration until cable slippage starts and then proceed to the next size push wheels.


3
3
4
4
2
1
2
1

SYSTEM SET-UP & INSTALLATION

FOR FIBERGLASS PUSH CABLE ASSEMBLIES ONLY:

Attach the Lateral Video Cable to the Push Cable:

NOTE: Prior to mating the cable, ensure that both internal and external threads are clean of any debris, and then lubricate with anti-seize, CUES P/N #940700.

1. Align the visual markers and guide pins and mate the cable ends together.





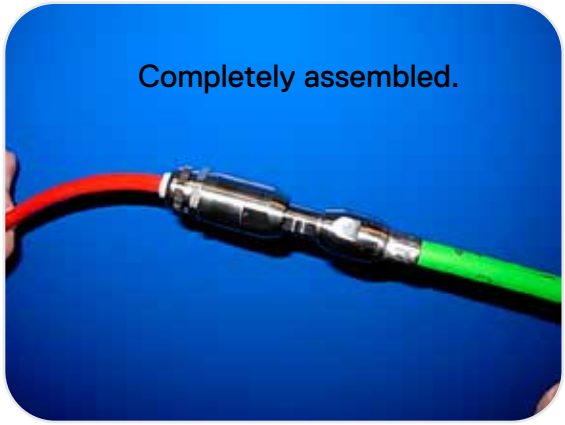
2. Thread the cable nut completely, ensuring the o-ring is covered and no physical play can be felt between the ends. Note: Ensure that alignment between the connectors is maintained while threading. Permanent damage may occur is fastened while misaligned.





3. Tighten with a wrench.





INSTALL THE STRAIN RELIEF CABLES:

1. Position the strain relief clamp on the push cable flush with the end of the cable fitting.
2. Adjust the strain relief clamp on the lateral video cable such that both the cables and strain relieving wire ropes are taught.
3. Mark the position of the strain relief clamp on lateral video cable.
4. Move the strain relief clamp .25-.5 inches away from the mark to create slack in video cables. (This equates to the strain relief being approximately 2 inches from the end of the cord grip spring).
5. Tighten the screws on the strain relief clamps.
6. Ensure the wire rope strain relief cables are taught and the video cables have some slack.





HOW TO FLIP THE FIBERGLASS PUSH CABLE

Perform this procedure to prolong the cable life. Refer to the previous sections for more detailed intructions of specific procedures.

To flip the cable:

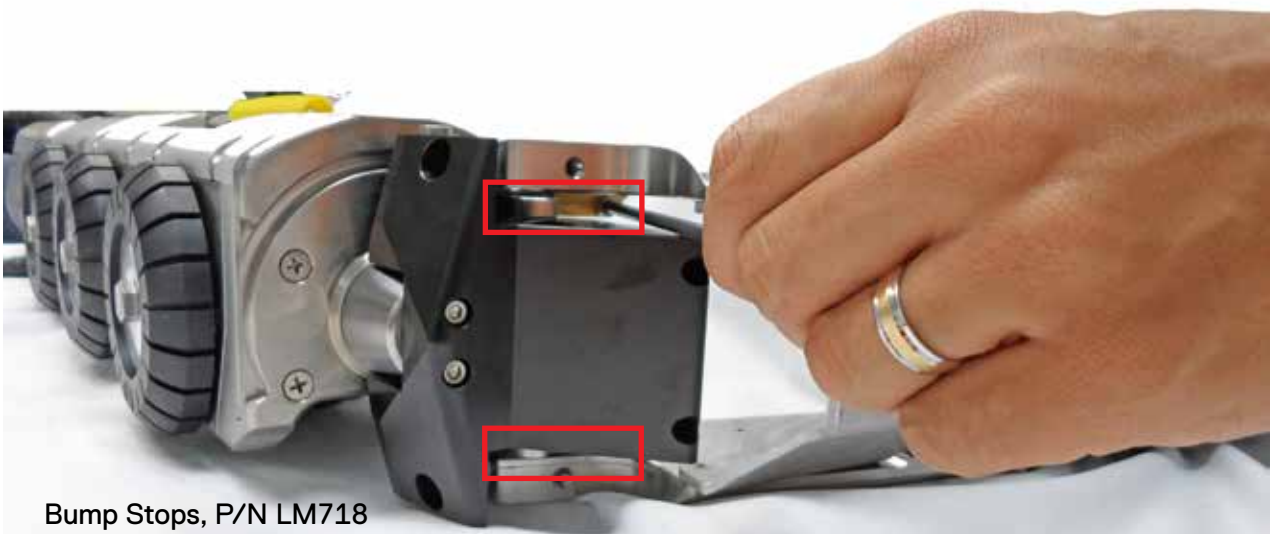
1. Remove the cable from the LAMPII transporter.
2. Unscrew the spring end from the push cable.
3. Pull out the entire length of the push cable from the reel.
4. Detach the push cable from the lateral video cable.
5. Attach the other end of the push cable to the lateral video cable.
6. Use the reel controller to wind up the push cable only, leaving enough to install into the LAMPII launcher.
7. Reinstall the spring end.
8. Reinstall the push cable into the LAMPII launcher.

HOW TO REPLACE WORN BUMP STOPS

If removable bump stops are present, follow the procedure below for replacement:

1. There are (2) screws, (1) located on each bump stop. Using an Allen Wrench, remove the (2) screws as shown.
2. Replace with new bump stops, P/N LM718.
3. Apply blue loctite and secure using an Allen Wrench.

NOTE: In the first quarter of 2016, all LAMPII's will be manufactured with replaceable bump stops to ensure proper camera alignment within the pipeline. Refer to the INSTALLING THE LAMPII IMMOBILIZING BLOCK procedure in this chapter for pictures to differenciate between the old versus new bump stops.



Bump Stops, P/N LM718

HOW TO OPERATE THE REEL BRAKE





There are (2) brake systems for the fiberglass push cable configuration reel: one provides tension against the flanges of the drum to prevent over-spinning and bird-nesting of the video cable. The other is used to lock the motion of the drum.

TENSIONER:

To adjust the tensioner:

1. Turn the knob (located on the side of the reel drum) until the pad contacts the reel flange.

2. Tighten the brass lock-nut.

NOTE: To ensure free movement of the reel, do not over-tighten the tensioner. The cable should be able to payout easily.

BRAKE:

1. Use the lever to activate the brake and stop the movement of the reel.

2. To lock the reel, push the lever through it's full motion. In this position, cable payout and retrieval is locked.







LINE TRACING CABLE EXTENSION WITH LAMPII - (FIBERGLASS PUSH CABLE CONFIGURATION):

A terminal post is available on the LAMPII Reel for connection of a transmitter (MS250, Prototek BuzzBox), for line tracing purposes (quick, accurate line and utility locating). Extended cables (LM600-15, LM600-30, & LM600-50) are available for use when using the line tracing feature with the LAMPII. Reference the photos on the opposite page with the terminal in red.

Cable P/N's LM600-15, -30, or -50 (depending on desired footage length) should only be used to connect the reel and the BuzzBox, P/N MS250, during line tracing. When not in use, the transmitter should be turned OFF (per the manual), and the LM600 cable should be detached from the reel. If not detached, the cable will act as a massive antenna on the ground line and could induce video noise. Refer to the Transmitter Manual for detailed operation instructions.

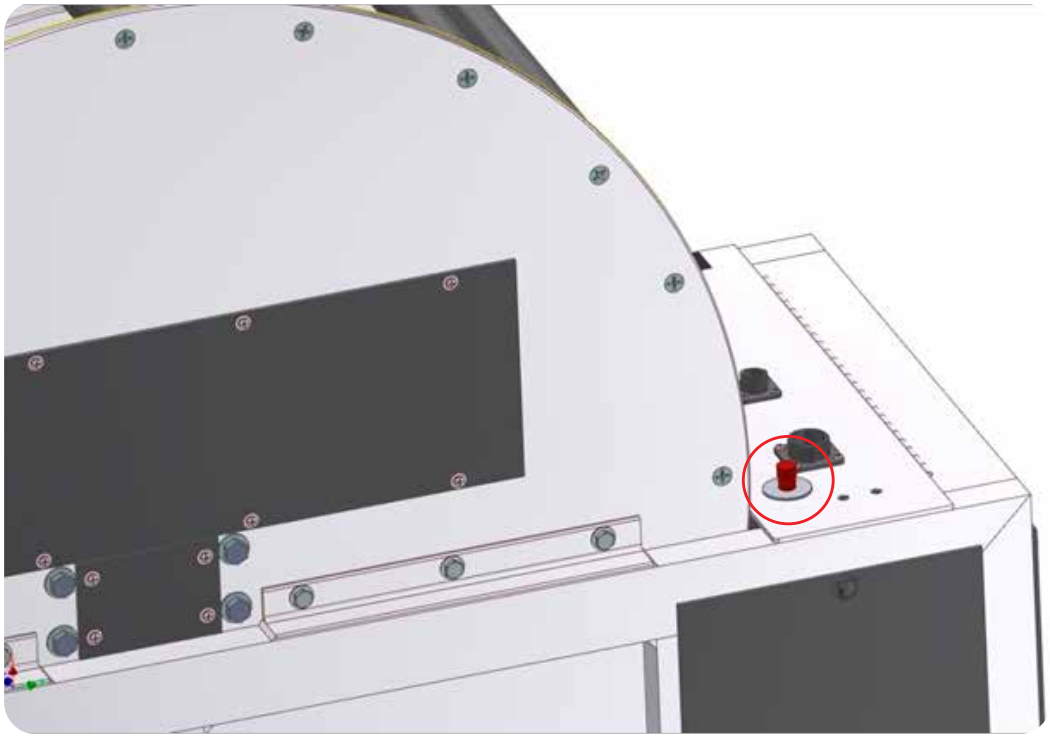
P/N LM600 (and applicable dash numbers) can be used to extend the cable length for the MS250 (Prototek BuzzBox) when using line tracing with the LAMPII.

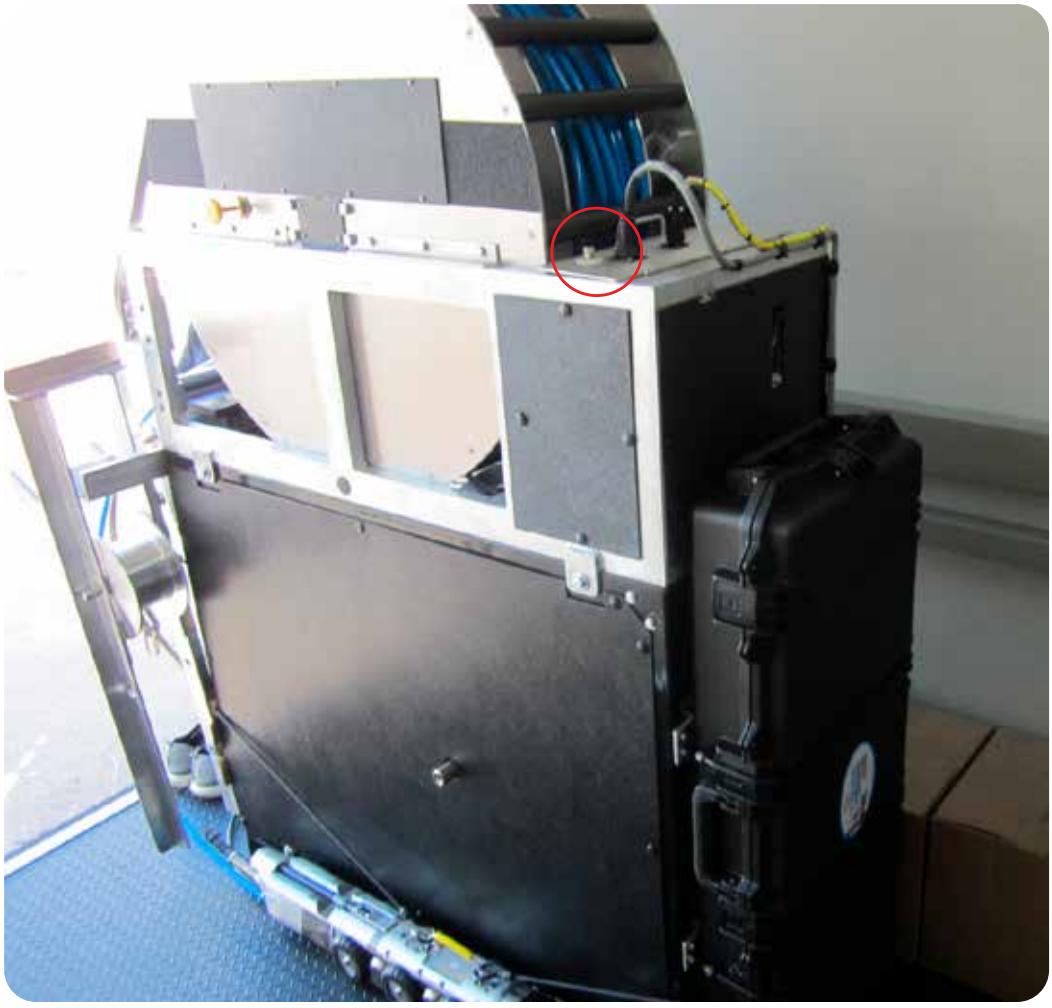
To use the cable:

1. Connect the red clamp from cable P/N MS250 to the mounting post of the reel, Item #42, of P/N LM360.
2. Then connect the black clamp from cable P/N MS250 to the banana plug of P/N LM600.
3. The black clamp of P/N LM600 should be connected to earth ground as explained in the Prototek user's manual. This manual comes with P/N's MS250 and MS327 (Prototek LF2200).

IMPORTANT: The LM600 should ONLY be used during line tracing. It will act as a massive antenna on the ground line and could induce video noise. It should be detached when not in use.

Refer to the Transmitter Manual for detailed operation instructions.





HOW TO INSTALL THE IMMOBILIZING BLOCK

When operating the LAMPII as a mainline transporter without the lateral camera and push cable, the transporter head can bend at the articulated joint, potentially hitting an obstruction in the pipe due to the lack of straightening force from the missing push cable or camera. An Immobilizing Block is now available to keep the head straight when using the transporter without the lateral camera. It is composed of three parts: one aluminum bottom piece with 2 dowel pins extending out of the sides, one Delrin rounded cover top piece with a mounting hole, and one 3/8 socket head cap screw to secure it.

This block will make the transporter a rigid, monolithic unit. Lowering the unit into the manhole will require extra care as the head assembly will not pivot with the attached head immobilizing block. **IMPORTANT! Use care when handling! Careless handling may result in the camera hitting the invert with all of the unit's weight behind it.**

The head immobilizing block can be field-retrofitted to all existing LAMPII units. Two immobilizing blocks are available and both are designed for use with the LAMPII / fixed view lateral camera configurations. For camera heads with replaceable bump stops, which will be in in production the beginning of 2016, use P/N LM758. For older assemblies, use P/N LM275. Note: The two versions can be visually differentiated by the ridges present for the replaceable bump stops. Refer to the figures on the opposite page.

continued...



P/N LM357 With Bump Stop Ridges

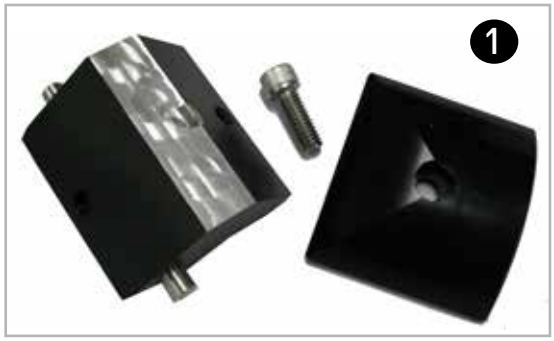


Camera Head Assembly with Launcher, P/N LM325: No Bump Stop Ridges

HOW TO INSTALL THE IMMOBILIZING BLOCK

INSTALLATION INSTRUCTIONS

1. Partially lift the head from the home position. Slide the bottom part in until the pins meet the fork sides. Orient the wedge part facing to the front and bottom of the unit with the threaded hole facing upwards. Gently let the LAMPII head return to it's home position.
2. Position the cover over the bottom piece. Ensure that the hole in the top aligns with the tapped hole in the bottom. Ensure that the curves of the top are facing the sides and front of the LAMPII.
3. Insert the screw and fasten tight.



From L to R, Bottom, Screw, Top





Figure 1: Insert the Bottom Piece as shown.



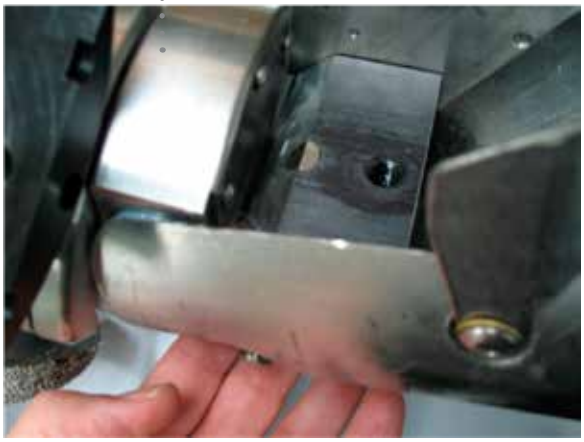




Figure 2: Position the cover.



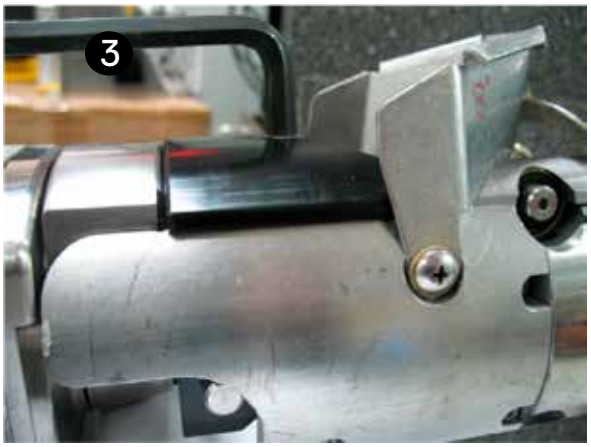
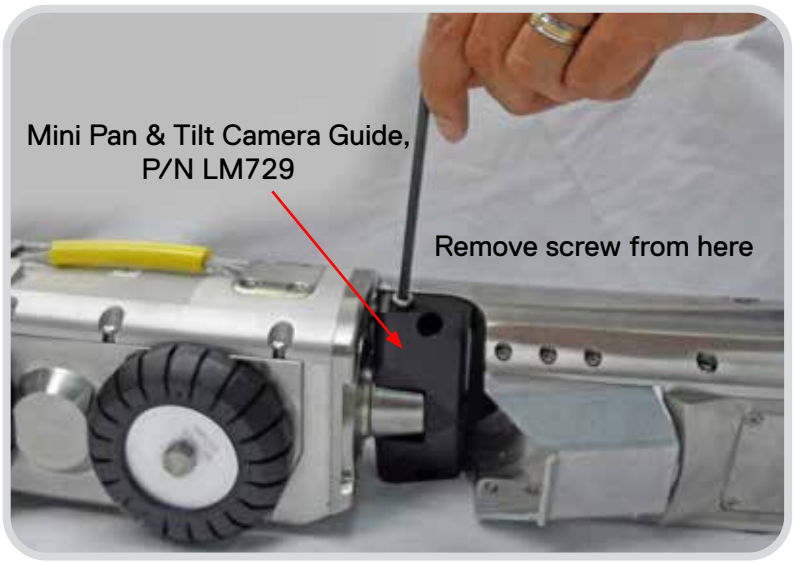


Figure 3: Fasten the screw.

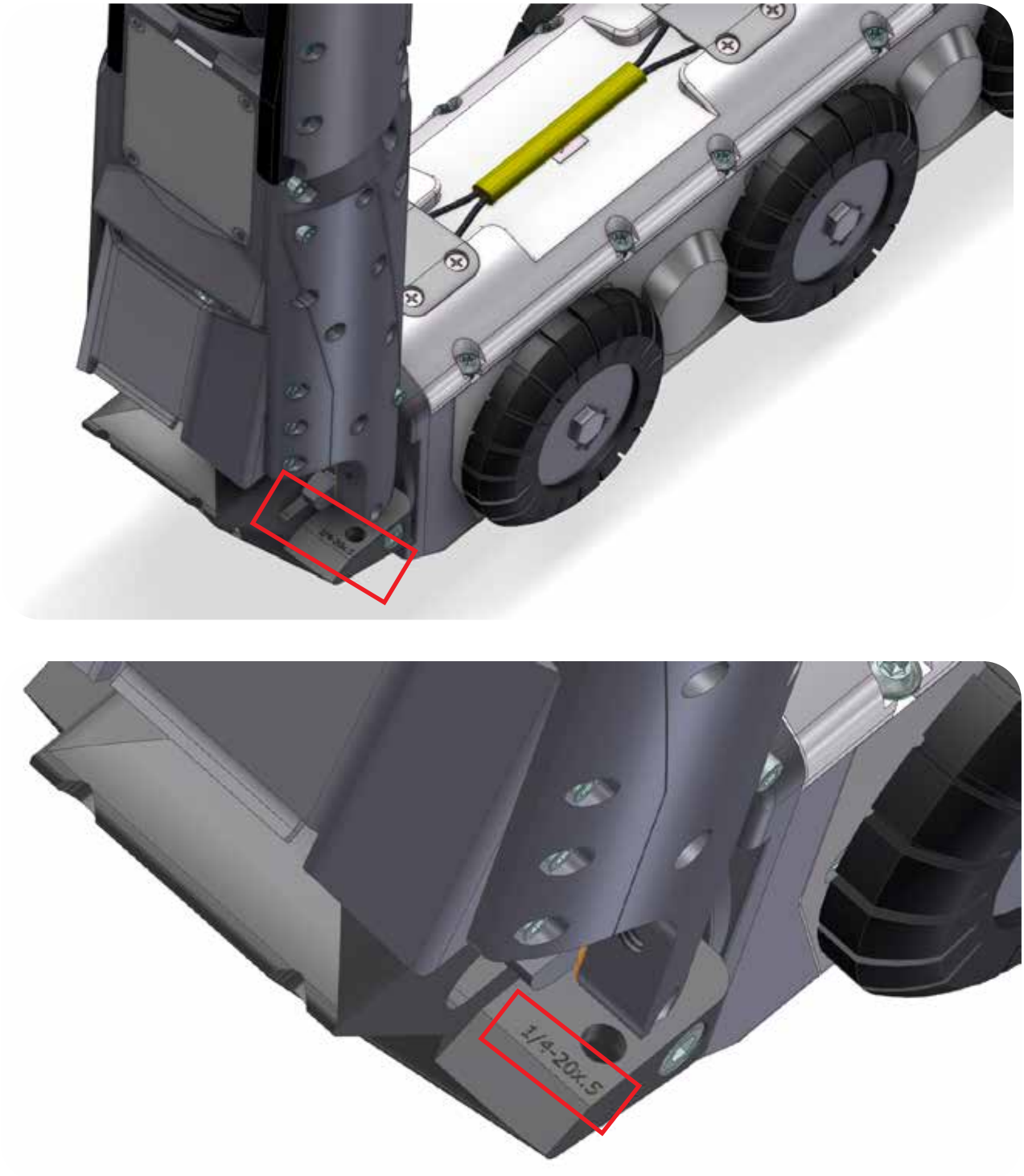
IMMOBILIZING THE CAMERA HEAD WHEN USING THE MINI PAN & TILT CAMERA COMPATIBLE LAMPII VERSION

When operating the Mini Pan & Tilt Camera compatible LAMPII version, immobilizing the camera head is accomplished with screws in P/N LM729, Mini Pan & Tilt Camera Guide, versus an immobilization block in the standard version. P/N LM729 is provided with the system. Perform the following to immobilize the camera head:

1. Using an Allen Wrench, remove the screws on the side of the camera guide as shown.
2. Using the screw that was removed in Step #1, install it on the bottom of the camera guide with an Allen Wrench as shown.







FYI: The immobilizing block screw size is engraved on the block for future reference.

5 FUNCTIONAL CHECKOUT

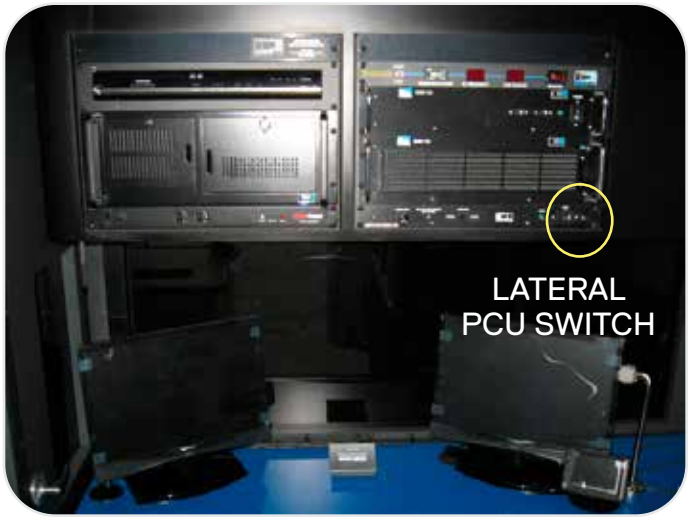
FUNCTIONAL CHECKOUT - K2 SUMMIT SYSTEMS

It is important to perform a functional checkout prior to placing the LAMPII in the pipe. The checkout is designed to uncover possible functional problems while the LAMPII is still on the surface. It is recommended that one technician view the monitor located inside the TV inspection vehicle to confirm the movements of the LAMPII while another technician performs the functional checkout. Be sure to follow the proper instructions for your specific system:1208 PCU or the K2 SUMMIT.

FOR SYSTEMS USING A K2 SUMMIT SYSTEM:

Power-up the LAMPII as follows:

1. Turn on the lateral PCU.
2. Turn on the K2 system and allow it to boot up.
3. Ensure that LAMPII is selected for the transporter field (refer to the next page).



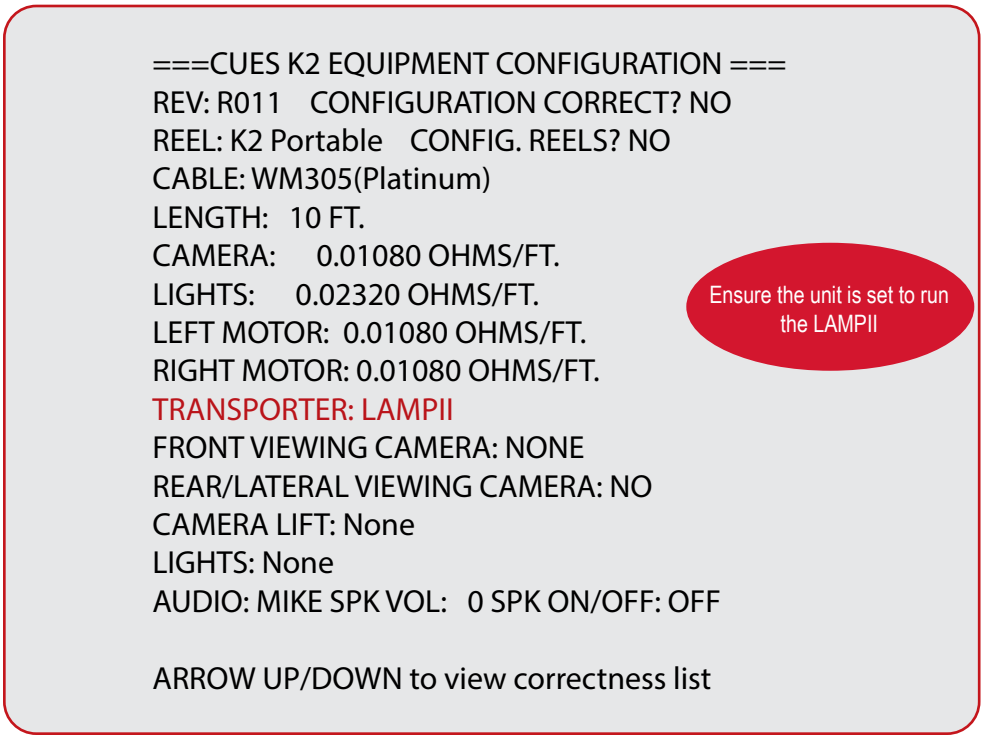


Ensure that all controls are functioning properly prior to placing the LAMPII in the pipe!

To ensure proper equipment operation and to prevent equipment damage (over-voltage), ensure that the TRANSPORTER field is set to LAMPII on the Equipment Configuration Screen (shown below). Please refer to the K2 User Manual regarding how fields work, the types of fields, etc.

LABEL: TRANSPORTER
Type - stored field, dependent on TYPE
Selections – None, Shorty, Ultra-Shorty, Steerable Pipe Ranger, Pipe Ranger, Steerable Mud Master, Mud Master, Koala, Compact Pipe Ranger, Ultra-Shorty-21, Ultra-Shorty-III, WTR, LAMPII
Default - None
Status Line - ARROW UP/DOWN to view transporter list.

MULTI CONDUCTOR EQUIPMENT CONFIGURATION SCREEN



Refer to the acceptance test procedures in P/N LM350 & MZ300 and ensure the equipment is functioning properly (using the Game Pad or Hand Held Controller as shown on the subsequent pages):

- Camera moves, functions work
- Push cable extend and retract
- Lights work; push camera lights DIM / BRIGHTEN
- Transporter moves FORWARD / BACKWARDS
- Ensure that the video is displayed on the monitor; clean the lens if necessary
- Check / verify the footage accuracy



CUES LOGITECH GAME PAD FUNCTIONS

WHEN USING A CUES TRANSPORTER AND/OR LAMP II & *MINI PAN & TILT* CAMERA



COLOR CODES

BLACK -
Works in standard mainline mode.

BLUE -
Works only when in lateral mode (using a LAMP II system).

GREEN -
Works when using a Mini Pan & Tilt Camera when in lateral mode.



CUES LOGITECH GAME PAD FUNCTIONS

WHEN USING A CUES TRANSPORTER AND/OR LAMP II & *MINI PAN & TILT* CAMERA



COLOR CODES

BLACK -
Works in standard mainline mode.

BLUE -
Works only when in lateral mode (using a LAMP II system).

GREEN -
Works when using a Mini Pan & Tilt Camera when in lateral mode.

WHILE PRESSING THE REEL BUTTON, SIMULTANEOUSLY PRESS THE PLUS OR MINUS BUTTON TO MOVE THE REEL FASTER / SLOWER SPEED

PRESS THE REEL AND "ON" BUTTONS SIMULTANEOUSLY FOR PAYOUT MODE

PRESS THE REEL AND "OFF" BUTTONS SIMULTANEOUSLY FOR RETRIEVE MODE

LAMP II IN LATERAL MODE: PRESS THE REEL BUTTON TO RETRACT THE LATERAL CAMERA (NOTE: REEL FUNCTIONS DISABLED). SPEED ALTERNATES BETWEEN FAST AND SLOW WITH EACH PRESS.



PRESS IN COMBINATION WITH THE DPAD 1 TO TURN CRUISE CONTROL ON
PRESS IN COMBINATION WITH THE DPAD 0 TO TURN CRUISE CONTROL OFF
PRESS IN COMBINATTION WITH THE DPAD + TO RAISE THE CRUISE CONTROL VOLTAGE
PRESS IN COMBINATION WITH THE DPAD - TO LOWER THE CRUISE CONTROL VOLTAGE

LAMP II IN LATERAL MODE WITH MPT CAMERA: PRESSING THE CRUISE BUTTON WHILE MOVING THE CAMERA JOYSTICK WILL MOVE THE MAINLINE CAMERA.

PRESS TO DISPLAY THE INTERNAL DIAGNOSTICS SYSTEM.

WHILE PRESSING THE LIGHTS BUTTON, SIMULTANEOUSLY PRESS THE PLUS OR MINUS BUTTON TO ILLUMINATE THE EXTERNAL LIGHTS BRIGHTER OR DIMMER

PRESS THE LIGHTS AND ON / OFF BUTTONS TO TURN THE INTERNAL LIGHTS ON/OFF

LAMP II IN LATERAL MODE: PRESS THE LIGHTS BUTTON TO EXTEND THE LATERAL CAMERA (NOTE: LIGHTS FUNCTIONS DISABLED).SPEED ALTERNATES BETWEEN FAST AND SLOW WITH EACH PRESS



CUES LOGITECH GAME PAD FUNCTIONS

WHEN USING A CUES TRANSPORTER AND/OR LAMP II & *MICRO PAN & TILT* CAMERA

COLOR CODES

BLACK -
Works in standard mainline mode.

BLUE -
Works only when in lateral mode (using a LAMP II system).

PURPLE -
Works when using a Micro Pan & Tilt Camera when in lateral mode.

MICRO PAN & TILT: WHEN COMBINED WITH THE DPAD '+' OR '-' INCREASE/ DECREASE THE FLOOD LIGHTS.



WHILE PRESSING THE IRIS BUTTON, SIMULTANEOUSLY PRESS THE PLUS / MINUS BUTTONS TO OPEN/CLOSE THE IRIS

WHILE PRESSING THE SHUTTER BUTTON, SIMULTANEOUSLY PRESS THE PLUS OR MINUS BUTTONS TO SHUTTER FAST/SLOW TO ENABLE VISIBILITY IN LOW-LIGHT CONDITIONS

WHILE PRESSING THE FOCUS BUTTON, SIMULTANEOUSLY PRESS THE PLUS OR MINUS BUTTONS TO FOCUS THE CAMERA NEAR/ FAR. ALSO, PRESS THE FOCUS BUTTON AND THE "ON" BUTTON SIMULTANEOUSLY TO AUTO-FOCUS

WHILE PRESSING THE ZOOM BUTTON, SIMULTANEOUSLY PRESS THE PLUS OR MINUS BUTTONS TO ZOOM THE CAMERA IN/OUT

MICRO PAN & TILT: WHEN COMBINED WITH THE DPAD '+' OR '-' INCREASE/ DECREASE THE SPOT LIGHTS.



USE THE JOYSTICK TO MOVE THE CAMERA. PRESS TO MOVE THE CAMERA TO THE HOME POSITION.

LAMPII IN LATERAL MODE WITH MICRO PAN & TILT CAMERA: USE THE JOYSTICK TO MOVE THE MICRO PAN & TILT CAMERA. PRESS TO MOVE THE MICRO PAN & TILT CAMERA TO THE HOME POSITION.

LAMP II IN LATERAL MODE: THE TRANSPORTER VOLTAGE IS REDUCED DURING LATERAL INSPECTION.

WHEN MOVING THE JOYSTICKS, NO VOLTAGE WILL BE APPLIED UNTIL THE OPERATOR HAS MOVED THE JOYSTICK APPROXIMATELY 20% AWAY FROM THE CENTER. THIS MAKES IT SO THAT THE TRANSPORTER DOESN'T HAVE ANY VOLTAGE APPLIED UNTIL THE OPERATOR ACTUALLY WANTS TO MOVE THE TRANSPORTER.

CUES LOGITECH GAME PAD FUNCTIONS

WHEN USING A CUES TRANSPORTER AND/OR LAMP II & *MICRO PAN & TILT* CAMERA



COLOR CODES

BLACK -
Works in standard mainline mode.

BLUE -
Works only when in lateral mode (using a LAMP II system).

PURPLE -
Works when using a Micro Pan & Tilt Camera when in lateral mode.

WHILE PRESSING THE REEL BUTTON, SIMULTANEOUSLY PRESS THE PLUS OR MINUS BUTTON TO MOVE THE REEL FASTER / SLOWER SPEED

PRESS THE REEL AND "ON" BUTTONS SIMULTANEOUSLY FOR PAYOUT MODE

PRESS THE REEL AND "OFF" BUTTONS SIMULTANEOUSLY FOR RETRIEVE MODE

LAMP II IN LATERAL MODE: PRESS THE REEL BUTTON TO RETRACT THE LATERAL CAMERA (NOTE: REEL FUNCTIONS DISABLED). SPEED ALTERNATES BETWEEN FAST AND SLOW WITH EACH PRESS.



PRESS IN COMBINATION WITH THE DPAD 1 TO TURN CRUISE CONTROL ON
PRESS IN COMBINATION WITH THE DPAD 0 TO TURN CRUISE CONTROL OFF
PRESS IN COMBINATTION WITH THE DPAD + TO RAISE THE CRUISE CONTROL VOLTAGE
PRESS IN COMBINATION WITH THE DPAD - TO LOWER THE CRUISE CONTROL VOLTAGE

LAMP II IN LATERAL MODE WITH MICRO P&T CAMERA: PRESSING THE CRUISE BUTTON WHILE MOVING THE CAMERA JOYSTICK WILL MOVE THE MAINLINE CAMERA.

PRESS TO DISPLAY THE INTERNAL DIAGNOSTICS SYSTEM.

WHILE PRESSING THE LIGHTS BUTTON, SIMULTANEOUSLY PRESS THE PLUS OR MINUS BUTTON TO ILLUMINATE THE EXTERNAL LIGHTS BRIGHTER OR DIMMER

PRESS THE LIGHTS AND ON / OFF BUTTONS TO TURN THE INTERNAL LIGHTS ON/OFF

LAMP II IN LATERAL MODE: PRESS THE LIGHTS BUTTON TO EXTEND THE LATERAL CAMERA (NOTE: LIGHTS FUNCTIONS DISABLED).SPEED ALTERNATES BETWEEN FAST AND SLOW WITH EACH PRESS

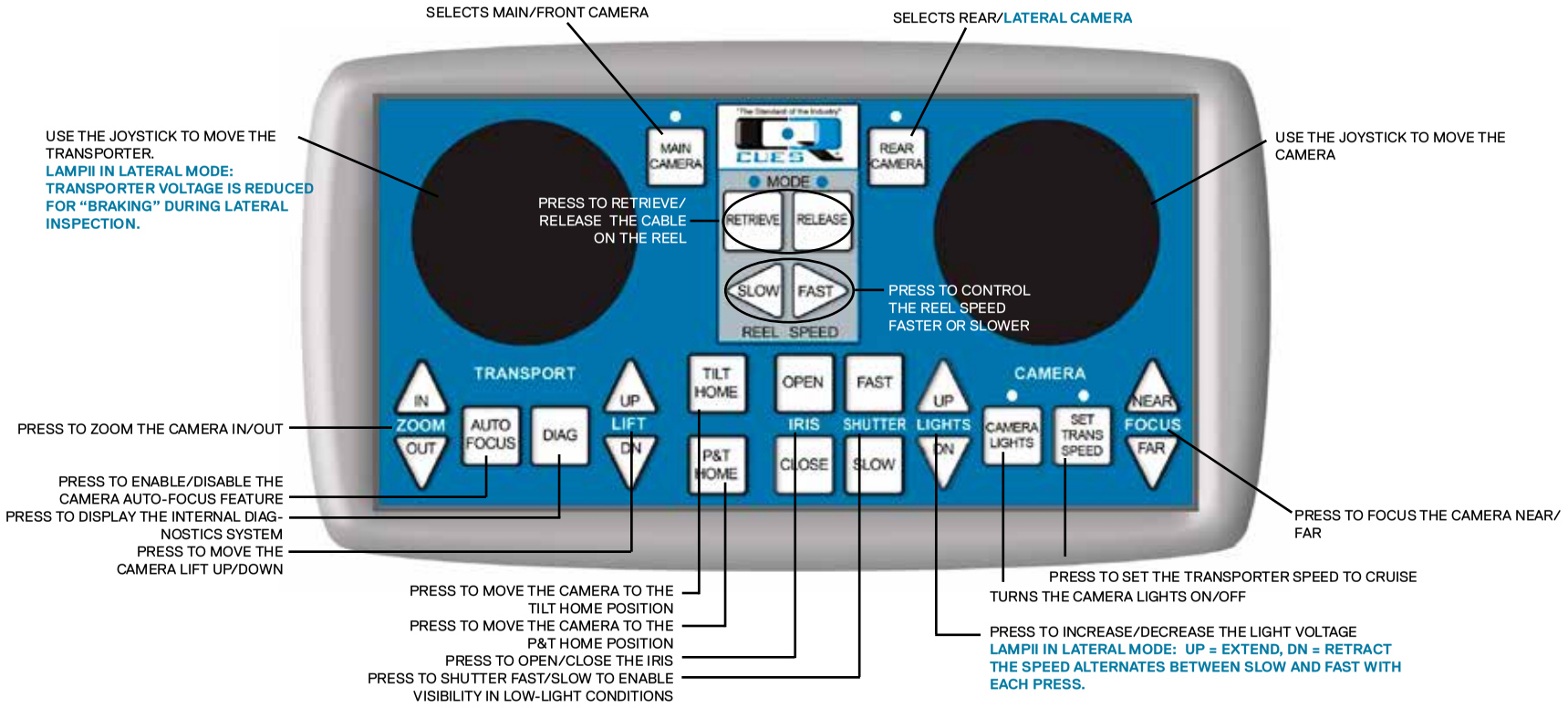
IMPORTANT CONTROLLER INFORMATION:

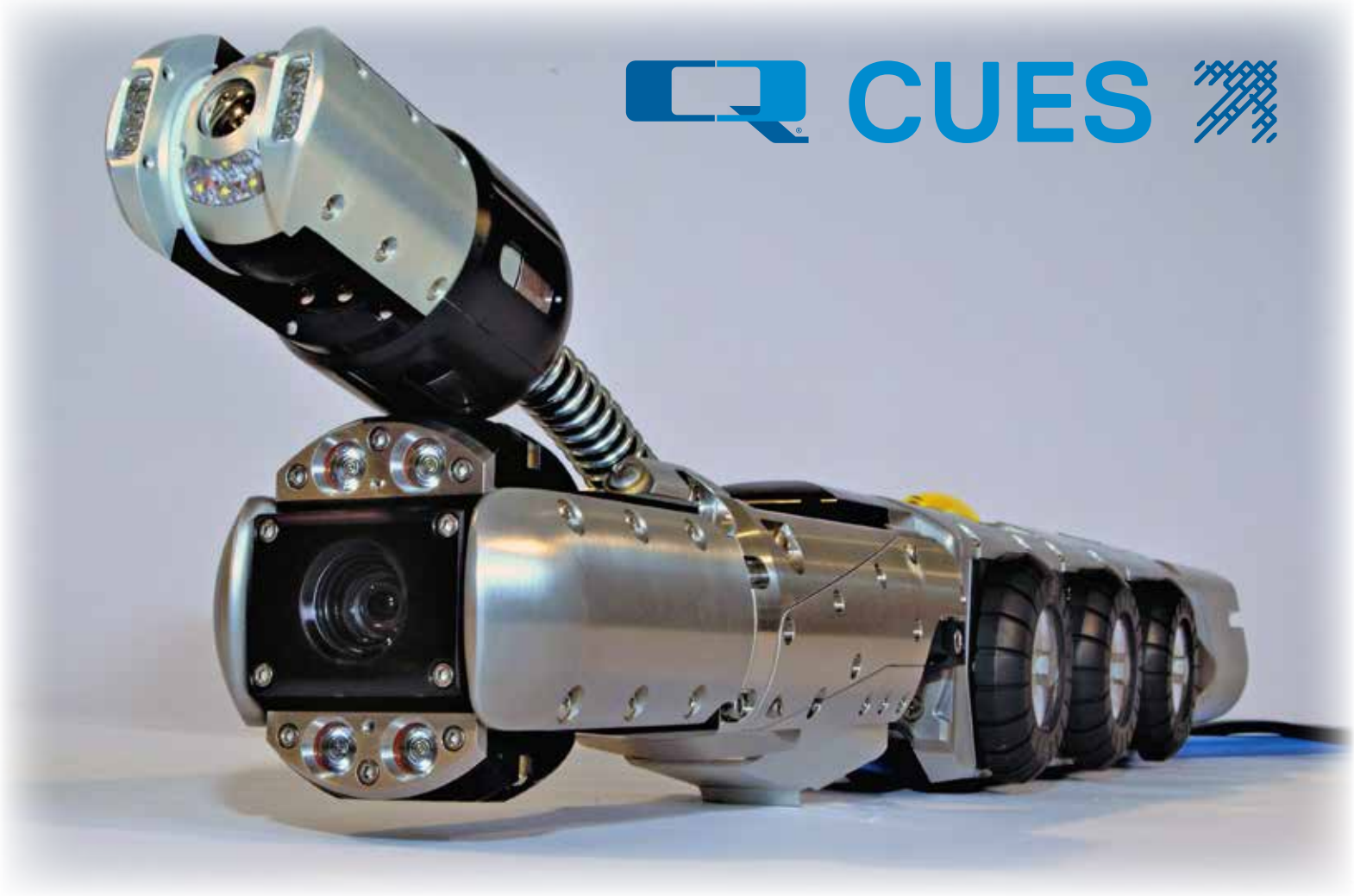
ANY K2 system will work with the Logitech WIRED controller...no modifications are necessary.
ANY K2 system will work with the Logitech WIRELESS controller...no modifications are necessary.

ONLY a K2 system with the Cues Wireless receiver (MZ421) will work with the Cues Handheld WIRELESS controller. These are:

Portable K2 PCU:	Truck Mounted K2:
MD340-1	MD380-1
MD640-1	MD680-1
MD640-3	MD680-3
MD640-5	MD680-5
MD640-7	MD680-7

HAND-HELD K2 CONTROLLER FUNCTIONS




CUES

5 FUNCTIONAL CHECKOUT

FUNCTIONAL CHECKOUT - 1208 PCU SYSTEMS

It is important to perform a functional checkout prior to placing the LAMPII in the pipe. The checkout is designed to uncover possible functional problems while the LAMPII is still on the surface. It is recommended that one technician view the monitor located inside the TV inspection vehicle to confirm the movements of the LAMPII while another technician performs the functional checkout.

FOR SYSTEMS USING A 1208 PCU:

Power-up the LAMPII as follows:

1. Turn ON the transporter controller.



2. Turn ON the lateral PCU (P/N LM340). The LED should be green, indicating that a non-steerable transporter has been detected.



3. Turn ON the multi-conductor PCU (P/N PC600). Set the light voltage to 150-160 volts.



Be sure to follow the proper instructions for your specific system: 1208 PCU or the SUMMIT.

Power-up the LAMPII - continued:

4. Turn on the PiP (LT600).



5. Turn ON the double-data, P/N TS801.



6. Turn ON the recording device and monitors.



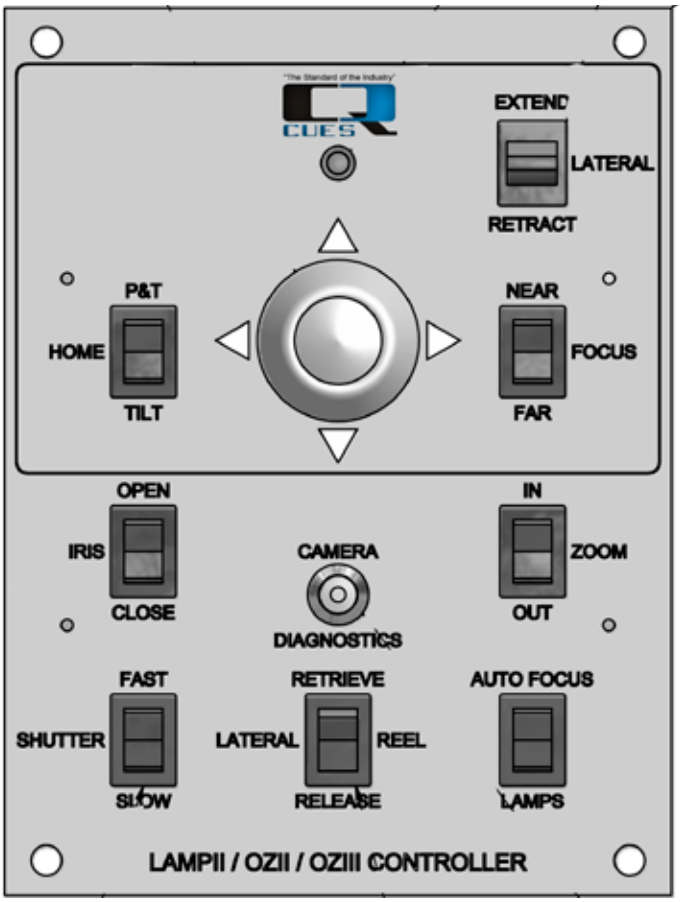
7. After the LED on the LAMPII functions controller lights up and the camera is initialized, refer to Chapter 5, Functional Checkout.



FUNCTIONAL CHECKOUT - 1208 PCU SYSTEMS CONTINUED

For systems using a 1208 PCU, the LAMPII launcher functions are controlled by the desk-mount controller. The controller is equipped with the following functions and controls:

A Shutter Push Button
B Iris Push Button
C Focus Push Button
D Shutter Indication LED
E Joystick
F Automatic Focus/Lamps Push Button
G Zoom Push Button
H Tilt Home/Pan & Tilt Home Push Button
I Lateral Extend / Retract
J Diagnostics
K Lateral Reel (Retrieve/Release)



LAMPII & Camera Controller: P/N LM320
(FOR SYSTEMS USING A 1208 PCU)

Refer to the acceptance test procedures in P/N LM350 & MZ300, and ensure the following are functioning properly:

- Camera moves, functions work
- Push cable extend and retract
- Lights work; push camera lights DIM / BRIGHTEN
- Transporter moves FORWARD /
- BACKWARDS
- Ensure that the video is displayed on the monitor; clean the lens if necessary
- Check / verify the footage accuracy

Ensure that all controls are functioning properly prior to placing the LAMPII in the pipe!

1. Ensure that all of the necessary electrical and physical connections have been made per the *System Setup and Installation* chapter in this manual.
2. Perform the standard start up procedure for a TV or TV seal system.
3. Turn ON the transporter and reel controllers, if applicable.
4. Pick up the push cable that is stored in the truck and lay it out (does not apply to Fiberglass Cable Assemblies).
5. Move the RETRIEVE/RELEASE control on the lateral reel controller to the RELEASE mode. Ensure that the lateral video cable on the reel unrolls easily.
6. At the lateral reel controller, adjust the SPEED / FORCE knobs clockwise to the desired position. Then set to FRONT. Ensure the LAMPII controller is set to RELEASE.
7. Ensure that the mainline cable reel controller is in the NEUTRAL position and the lateral reel in the RELEASED position.
8. Using the hook, set the LAMPII into the pipeline. Drive forward until the tow cables are in the pipe. Install the bottom and top hole rollers.
9. To move the LAMPII, slowly advance the speed control on the transporter controller. ***NOTE: Slowly accelerate to speed to help reduce wear on the motor and other electrical components.***
10. Using the controller, pan and tilt the mini-mainline camera to inspect the sewer pipe.
11. To ensure that the LAMPII remains centered in the pipeline during the inspection, refer to the *Centering the LAMPII in the Pipe* procedure in this chapter for more information.
12. For systems using a 1208 PCU: The operator can turn the picture-in-picture capabilities 'ON' at any time during the inspection. Refer to the *Operating the Picture in Picture* procedure in this chapter for more details regarding the functions and controls of the picture-in-picture unit.

NOTE:The SR300 lateral camera has been changed to incorporate a higher output sonde. For sonde camera P/N's SR300-8, SR300-9, SR300-10, please be advised that the sonde now operates on light voltage and the sonde output will vary with the light setting. For maximum sonde power, the camera lights must be turned to full brightness. If the lights are not on or the internal camera light overvoltage protection circuit is enabled, the sonde will not function.

LAUNCHING INTO LATERALS

1. After locating a lateral to inspect, move the mainline camera joystick on the LAMPII so that both the lateral and chute are visible. ***This will ensure that the mainline camera is able to monitor the insertion of the lateral camera into the lateral service.***

2. Use the EXTEND/RETRACT switch on the controller to propel and retract the mini-camera into the lateral. NOTE: The lateral reel should always be in the RETRIEVE mode while retracting the push cable (the switch is located on the controller). Verify visually that the lateral reel is retrieving the cable.

   NOTE: The EXTEND/RETRACT function is dual-speed. It changes from LOW to HIGH and vice versa any time the switch is toggled. It starts in LOW speed when switching directions.

3. After completing a lateral inspection, *and before retracting the lateral cable and moving on to the next lateral*, place the lateral cable reel in the RETRIEVE mode. RETRACT the lateral push cable, then switch back to RELEASE.

   NOTE: If you retract the lateral cable all the way, it will prevent the mainline camera head from rotating freely. Toggle the extend switch slightly to allow the mainline camera head to rotate.

   NOTE: *The lateral reel system is designed to keep tension on the lateral video cable while the launcher is transported through the pipeline and when the lateral camera is returning to the launcher.*

4. To prevent the cable from catching any offset(s) and potentially getting disconnected or damaged, ensure that a technician views the cable retrieval on the surface and that the lateral video cable continues to move until the push cable is fully retracted. Visually verify that the reel is picking up slack.

5. After completing the entire inspection, place the LAMPII controller in the RETRIEVE position, the transporter controller in the REVERSE position, and the mainline cable reel controller in the IN position. Put the transporter in FREE WHEEL by driving backwards slightly.

6. Put the main reel in the desired gear and and turn the reel controller ON.

7. Adjust the SPEED/FORCE controls on the LAMPII controller and gold reel controller until the lateral and mainline cables are tracking each other during the retrieval process.

   NOTE: *The LAMPII cable reel is designed to automatically track the cable when in the RETRIEVE mode. The mainline (gold) cable reel physically pulls the launcher and the lateral cable reel applies tension to the lateral cable to remove slack. When the gold cable speed increases or decreases, the lateral video cable will track with it.*

8. After the LAMPII has returned to the local manhole, use the hook to pull the LAMPII fom the manhole. Refer to the *Retrieving the LAMPII* procedure in this chapter for more information.

9. Turn OFF the lateral reel, transporter, and launcher controllers.

10. If this is the last inspection of the day, refer to the *Equipment Maintenance* procedure in this chapter for clean up instructions.

CENTERING THE LAMPII IN THE PIPE

To ensure the LAMPII is level and centered in the pipeline, it will be necessary to periodically check the orientation with reference to the waterline in the pipe. To check the orientation:

1. Stop the LAMPII.
2. Press the HOME Pan & Tilt button on the LAMPII controller and wait for the camera head to 'home'.
3. To level and center the LAMPII orientation, put the mainline cable reel in gear to hold the transporter in place and run the transporter at full speed until the LAMPII is level and centered in the pipe.
4. Verify the level and orientation and then continue with the inspection. ***NOTE: To ensure the unit remains stable in operation, perform this procedure before entering each lateral.***

CHANGING DIRECTIONS

1. To change from forward to reverse free wheel, allow the LAMPII to come to a complete stop before moving in the opposite direction.
2. After the LAMPII has stopped, move the directional switch on the transporter controller or K2 game pad controller (depending on your specific system) to REVERSE.
3. Advance the speed control to a low motor speed. The clutch will disengage after approximately two seconds and the LAMPII will begin to move rearwards. The transporter is now ready to freewheel in reverse.
4. Use the reel to pull the LAMPII back towards the control point and entry manhole.
5. To use the power reverse, make sure the directional switch on the transporter controller or K2 game pad controller (depending on your specific system) is set to REVERSE and then slowly advance the speed control.

6 OPERATING THE LAMPII

THE PIP SECTION BELOW IS FOR 1208 PCU SYSTEMS ONLY!

OPERATING THE PICTURE IN PICTURE (PIP)

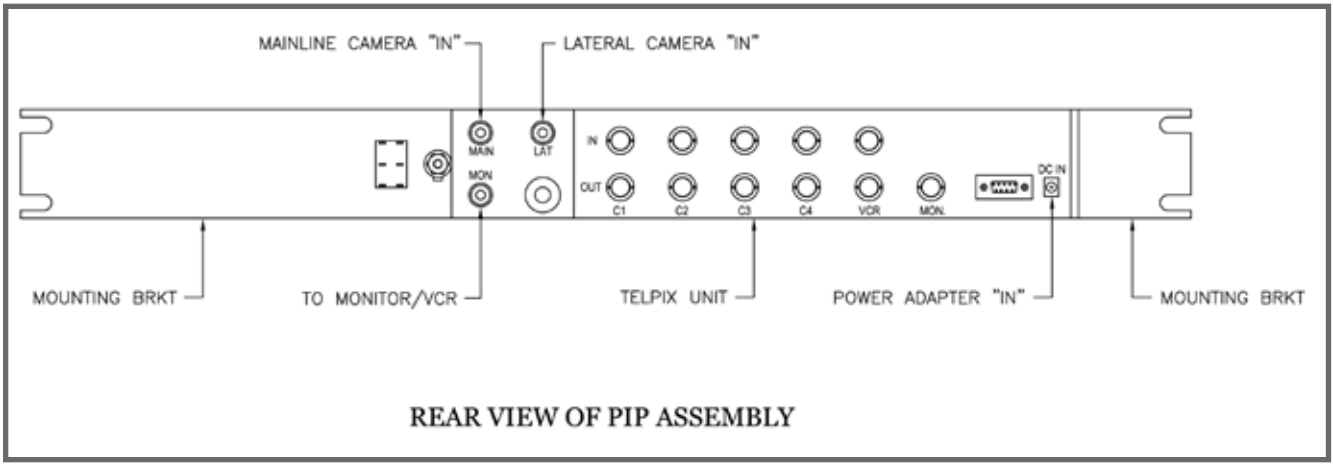
The LAMPII is equipped with picture in picture (PIP) capabilities. This allows the video from the two cameras to be viewed simultaneously on the monitor in various ways. The PIP is equipped with the following functions and controls *(see the figures below and additional instructions in LT600-INST):*

PIP INSTALLATION

NOTE: All BNC video connections at the rear of the Telpix PiP unit have been completed during assembly at CUES. Do not disconnect or move any of the BNC connectors as the unit will not perform correctly. Make all connections to the RCA connectors located at the rear of the right side mounting bracket (located at the left side in the rear view below).

For the following steps, refer to view below:

1. Connect the RCA cable from the mainline camera to the RCA connector labeled “main” on the rear of the pip mounting bracket.
2. Connect the RCA cable from the lateral camera to the RCA connector labeled “lat” on the rear of the pip mounting bracket.
3. Connect the RCA cable from the monitor/VCR to the RCA connector labeled “MON” on the rear of the pip mounting bracket.
4. NOTE: Use only the supplied Telpix power adapter to connect to AC power. Use of any other adapter may result in damage to the unit. Connect the supplied power cable to the “DC IN” connector located at the lower right side of the Telpix unit.



REAR VIEW OF PIP ASSEMBLY

THE PIP SECTION BELOW IS FOR 1208 PCU SYSTEMS ONLY!

PIP OPERATION - CONTINUED

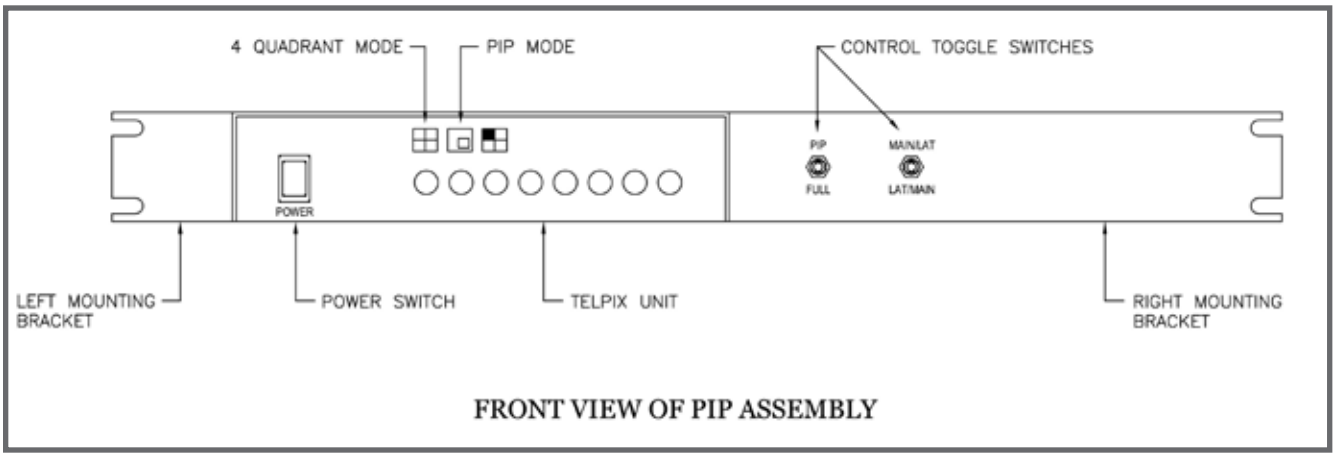
NOTE: The telpix unit was designed to accept up to four separate video sources. Only two inputs are used with cues equipment. The unit has an internal “alarm” mode which cannot be disabled. If any of the video input signals are interrupted, the unit will display the four quadrant screen briefly (the “alarm” screen) and then return to the front panel setting. This is normal operation of the unit and may occur whenever the front panel toggle switches are toggled.

For the following steps, refer to view below:

1. Place the two toggle switches located on the right mounting bracket to the UP positions (“PiP” and “MAIN/LAT”).
2. Turn unit ON with the front panel POWER switch. All eight green LED’s should illuminate and the unit should produce several “beeps”.
3. After several seconds, all LED’s should extinguish except for the first. This is the four quadrant display button, and the monitor should display four quadrants on the screen.
4. Press the second button for the PiP display. The first led should extinguish and the second and third led’s should illuminate. This is the PiP mode. The monitor should show the mainline camera in the background and the lateral camera in the PiP window.
5. All other Telpix front panel buttons should be left unused.

FRONT PANEL TOGGLE SWITCH OPERATION

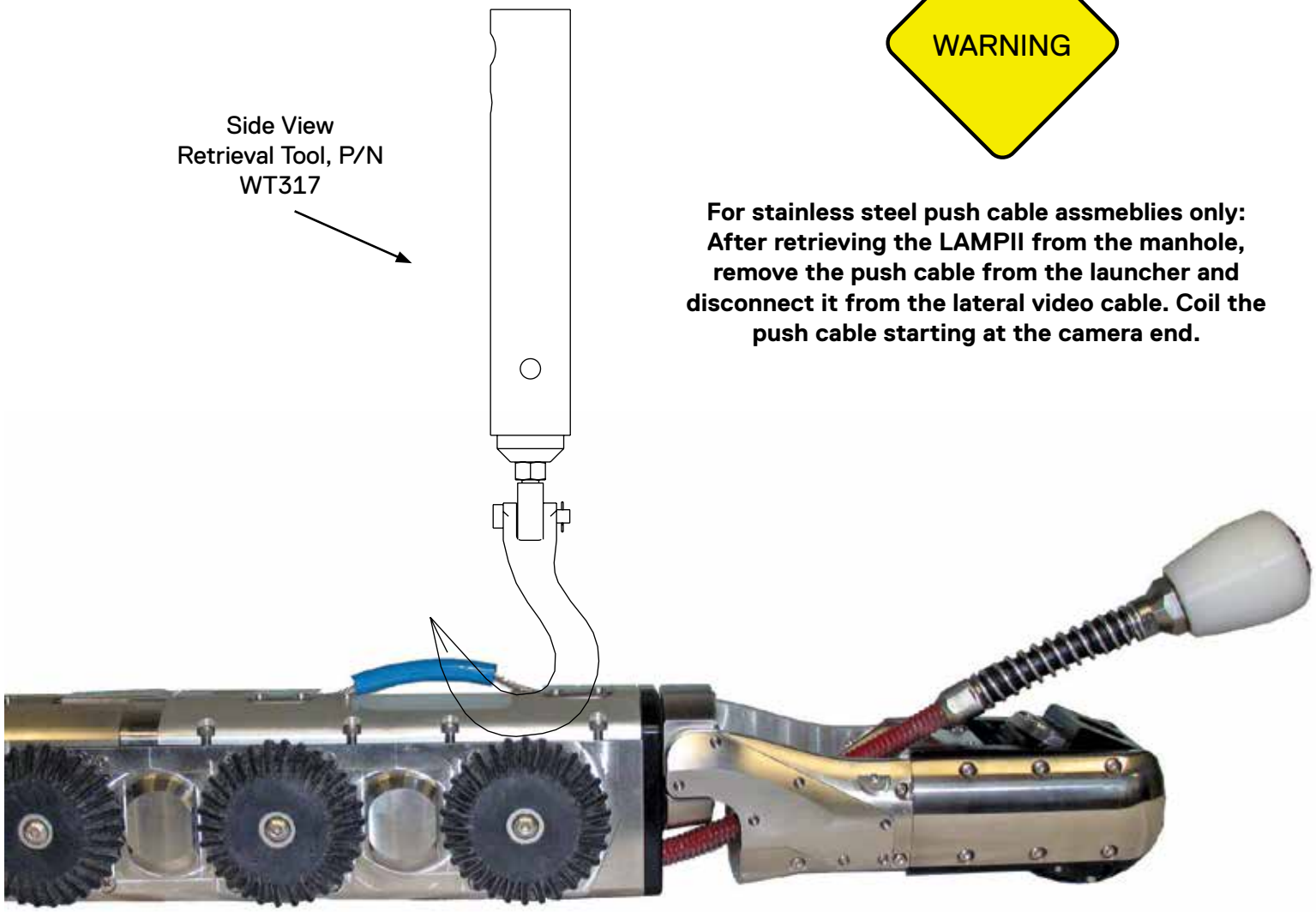
1. The left toggle switch labeled PiP and FULL either places the PiP window in the lower right of the monitor or removes it from the screen completely. When in the FULL mode, only the camera providing the background image will be displayed.
2. The right toggle switch labeled MAIN/LAT and LAT/MAIN works accordingly:
   A) MAIN/LAT places the mainline camera in the background and the lateral camera in the PiP window.
   B) LAT/MAIN places the lateral camera in the background and the mainline camera in the PiP window.



FRONT VIEW OF PIP ASSEMBLY

RETRIEVING THE LAMPII

After the inspection, shut the system down before retrieving the LAMPII from the manhole to protect personnel and equipment from electrical shock. Carry the LAMPII by its transporter assembly, not the TV/push cable. The standard option consists of a single-hook used in conjunction with a lifting strap as shown below.



WARNING

For stainless steel push cable assmeblies only: After retrieving the LAMPII from the manhole, remove the push cable from the launcher and disconnect it from the lateral video cable. Coil the push cable starting at the camera end.

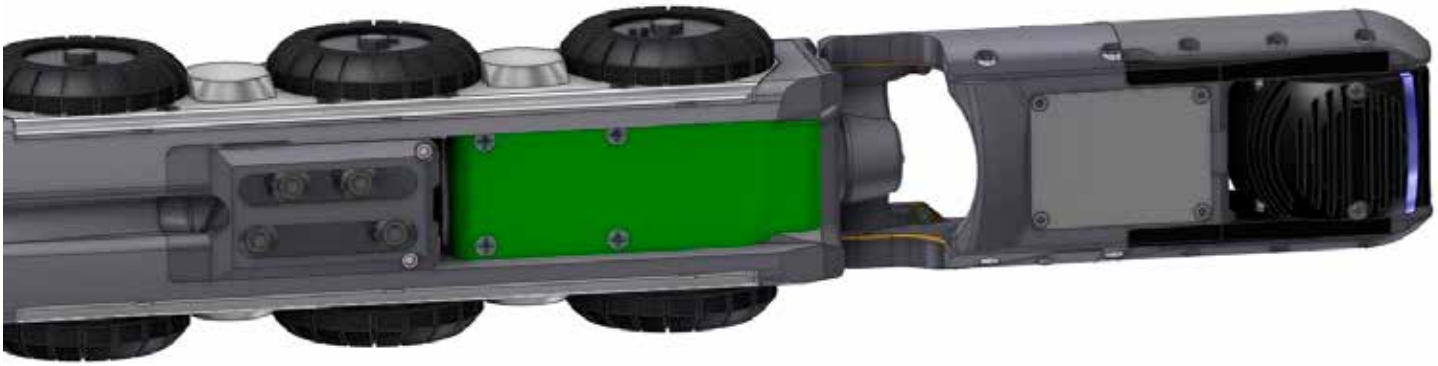
EQUIPMENT MAINTENANCE

1. Clean the LAMPII equipment with detergent and water after each day of use.
2. Prior to use, check all cables coming from the transporter and launcher for cuts or worn areas. If wear on the cables is discovered, the cables should be repaired or replaced immediately. Do not operate the LAMPII with worn or cut cables.
3. Never remove the cover from the motor or controllers. These areas contains delicate electronic components. Opening any of these areas will result in the warranty being voided.
4. Carry the LAMPII by it's frame rather than the TV cable.

UNDERBODY WEAR PLATE INSPECTION / MAINTENANCE

For alternate push configurations, periodically inspect the leading edge of the wear plate (P/N LM740) shown in GREEN in the picture below. This wear plate protects the LAMPII body from push cable wear and should be replaced if the leading edge is broken, or severely grooved to avoid costly repairs to the transporter itself.

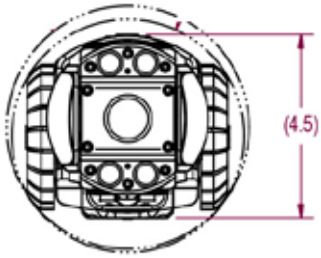
The plate is attached with four screws: P/N 103045 in LM350-2, -4, & -9 configurations, and P/N HW2818 in LM350-6,-7,-8, & -10 configurations(a cover is also present in these configurations).



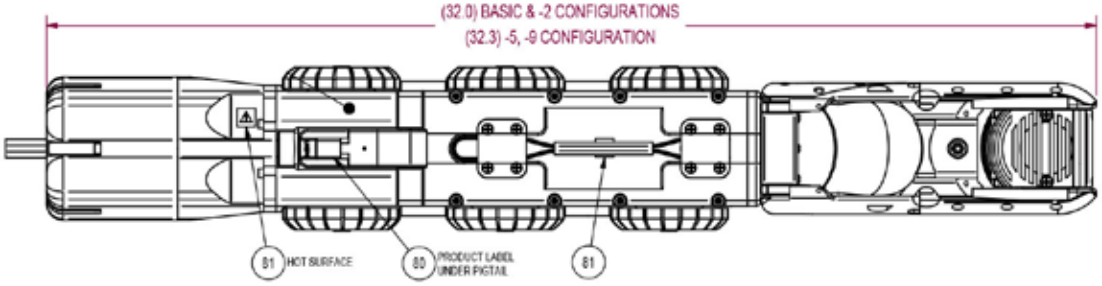
LAMPII BOM & EXPLODED VIEW DRAWINGS

FIGURE 1A. LAMP II,80'PUSH CABLE & SELF UPRIGHT/NTSC, LM350

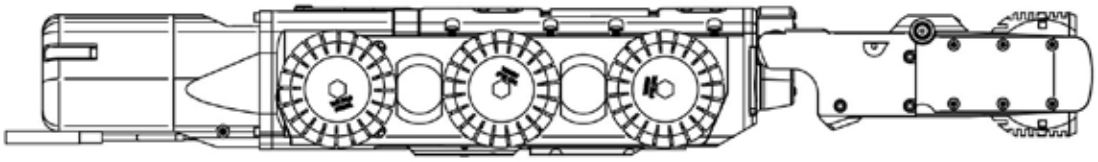
CONFIGURATION LIST		
PART NUMBER	DESCRIPTION	STATUS
LM350	LAMP2,80'PSH CBL&SLF UPR/SND/NTSC	ACTIVE
LM350-2	LAMP2,ALT PSH DR,NO CAM&PSH CBL	ACTIVE
LM350-3	LAMP2,80'PSH,SLF UPR/SND,W/REAR CAM	OBSOLETE
LM350-4	LAMP2,ALT PSH,NO CAM&CBL,W/REAR CAM	OBSOLETE
LM350-5	LAMP2,ALT PSH,NO CAM&CBL,F/REAR CAM	ACTIVE
LM350-6	LAMP2,ALT PSH,LP&T,NO CAM&PSH CBL	ACTIVE
LM350-7	LAMP2,ALT,LP&T,NO CAM CBL,W/RV CAM	OBSOLETE
LM350-8	LAMP2,ALT,LP&T,NO CAM CBL,F/RV CAM	ACTIVE
LM350-9	LAMP2,ALT PSH,NO CAM&CBL,F/REAR CAM, PAL	ACTIVE
LM350-10	LAMP2,ALT,LP&T,NO CAM CBL,F/RV CAM, PAL	ACTIVE



CONFIGURATIONS FOR FIXED VIEW LATERAL CAMERA



APPROX. WEIGHT (no push cable or tow cable) = 58 lbs



CONFIGURATIONS FOR LATERAL P&T AND FIXED VIEW CAMERAS

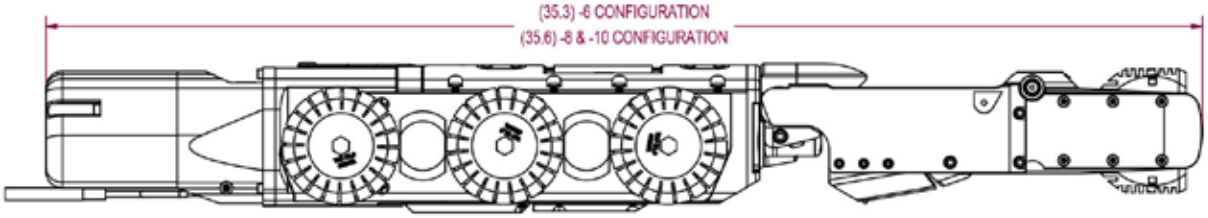
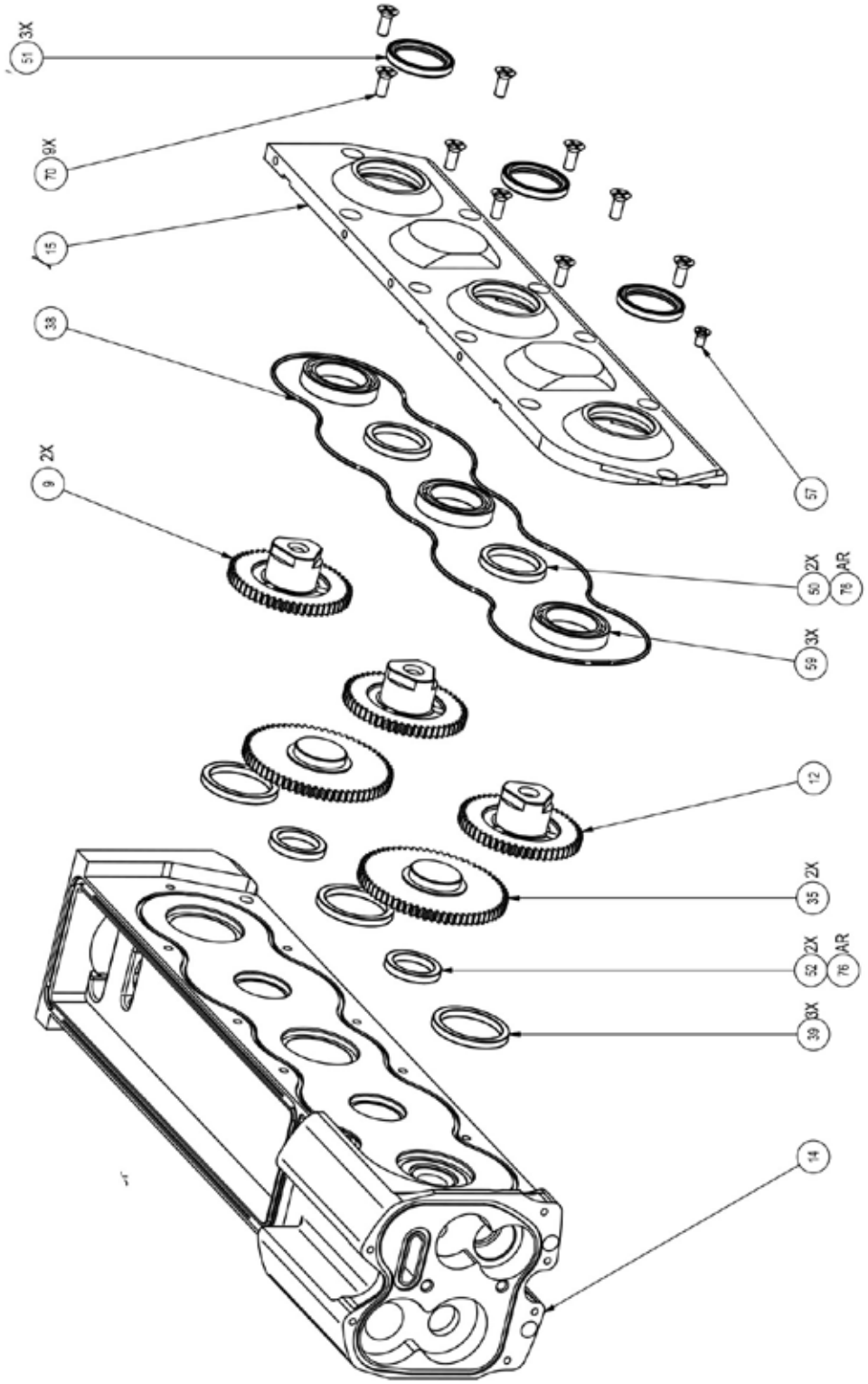


FIGURE 1B. LAMP II,80'PUSH CABLE & SELF UPRIGHT/NTSC, LM350



LAMPII BOM & EXPLODED VIEW DRAWINGS

FIGURE 1C. LAMP II,80'PUSH CABLE & SELF UPRIGHT/NTSC, LM350

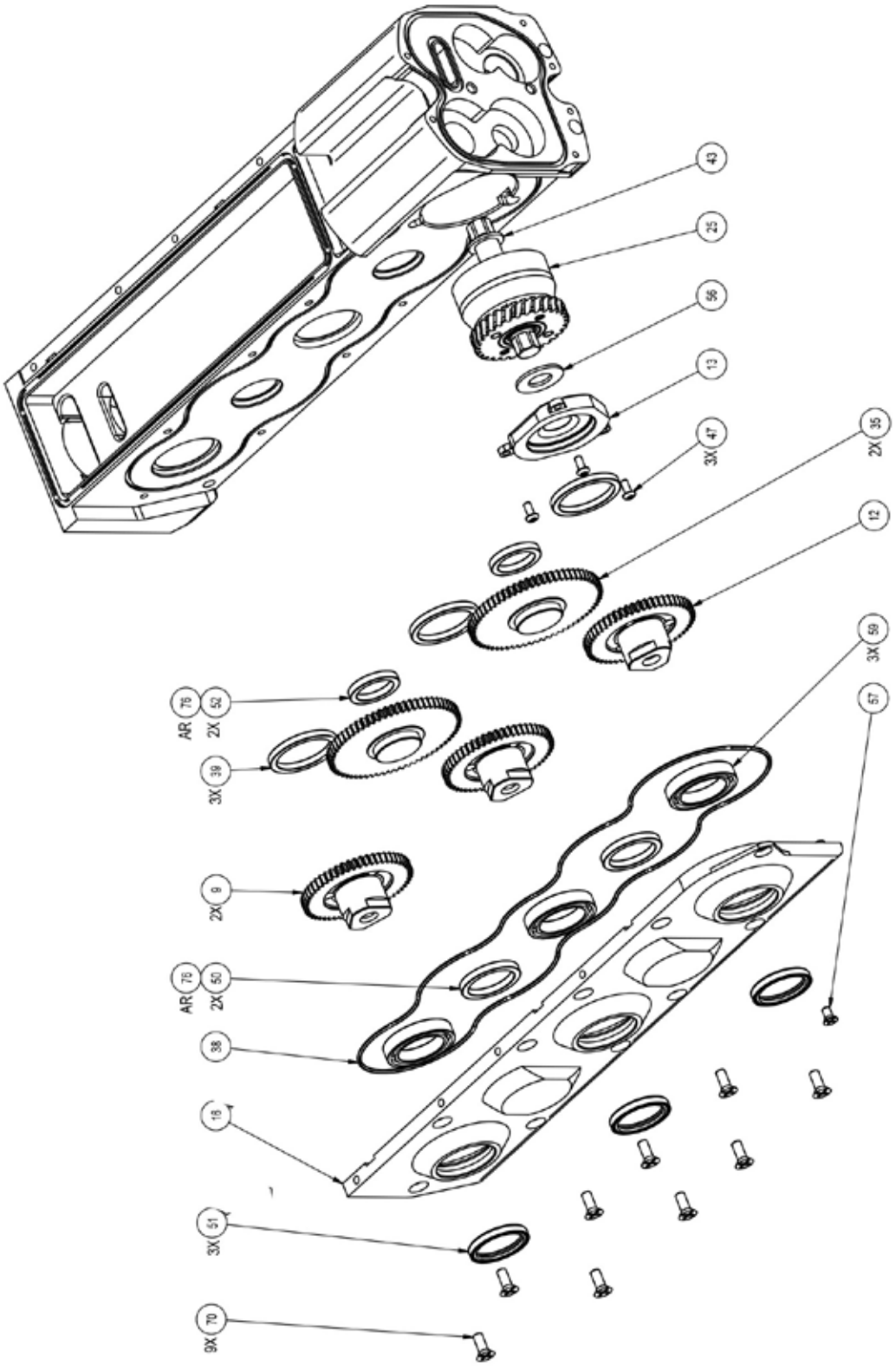
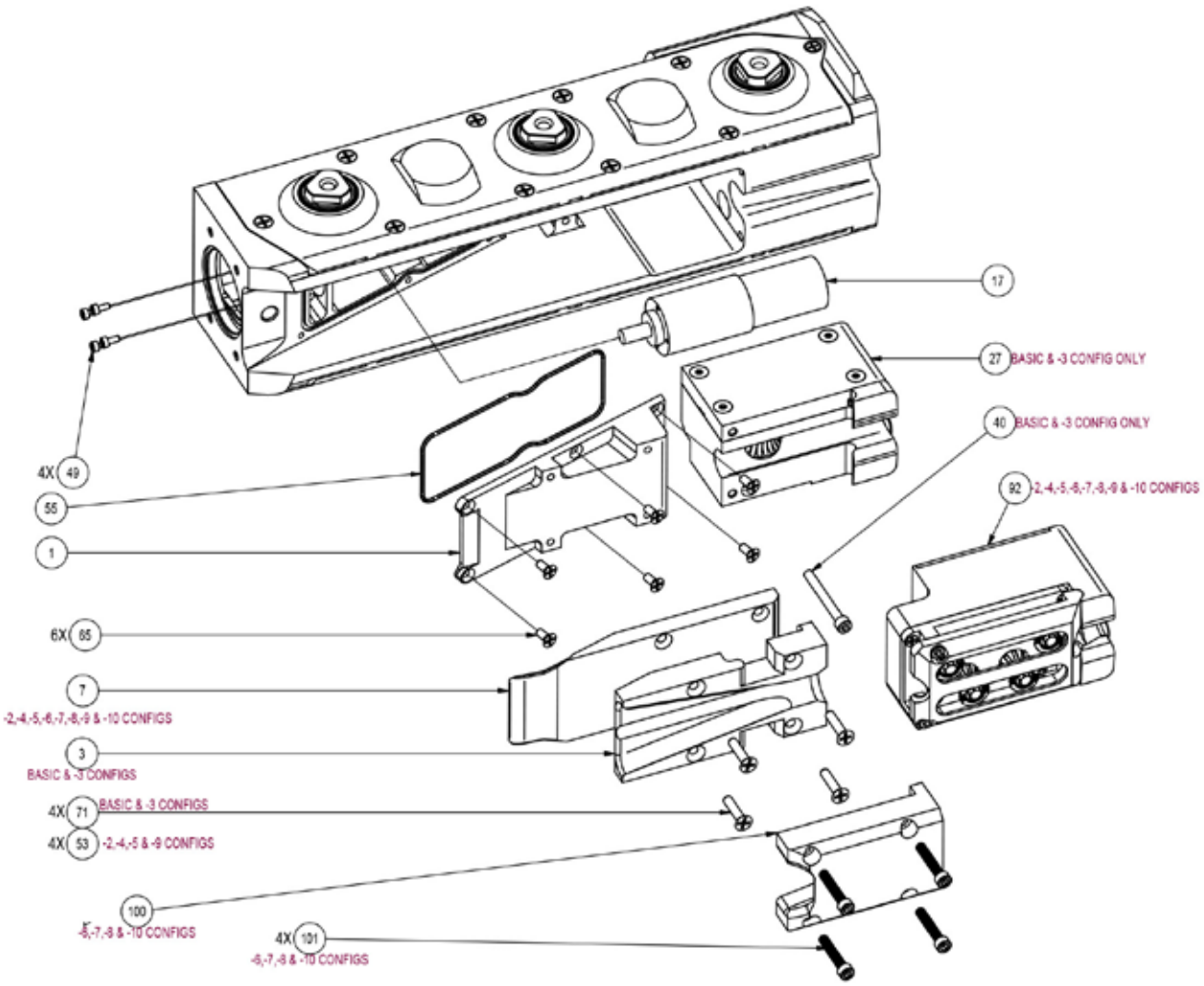


FIGURE 1D. LAMP II,80'PUSH CABLE & SELF UPRIGHT/NTSC, LM350



LAMPII BOM & EXPLODED VIEW DRAWINGS

FIGURE 1E. LAMP II,80'PUSH CABLE & SELF UPRIGHT/NTSC, LM350

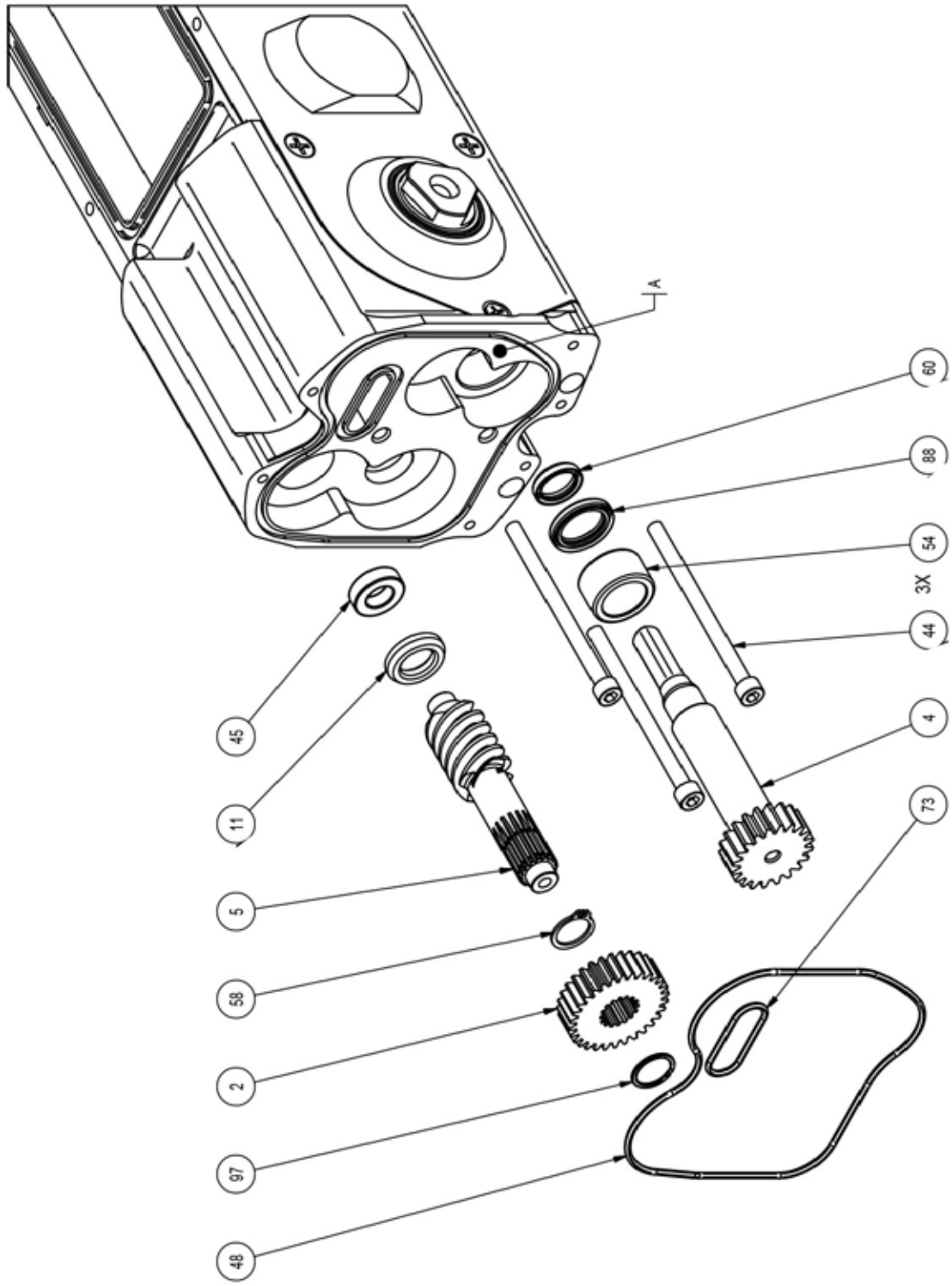
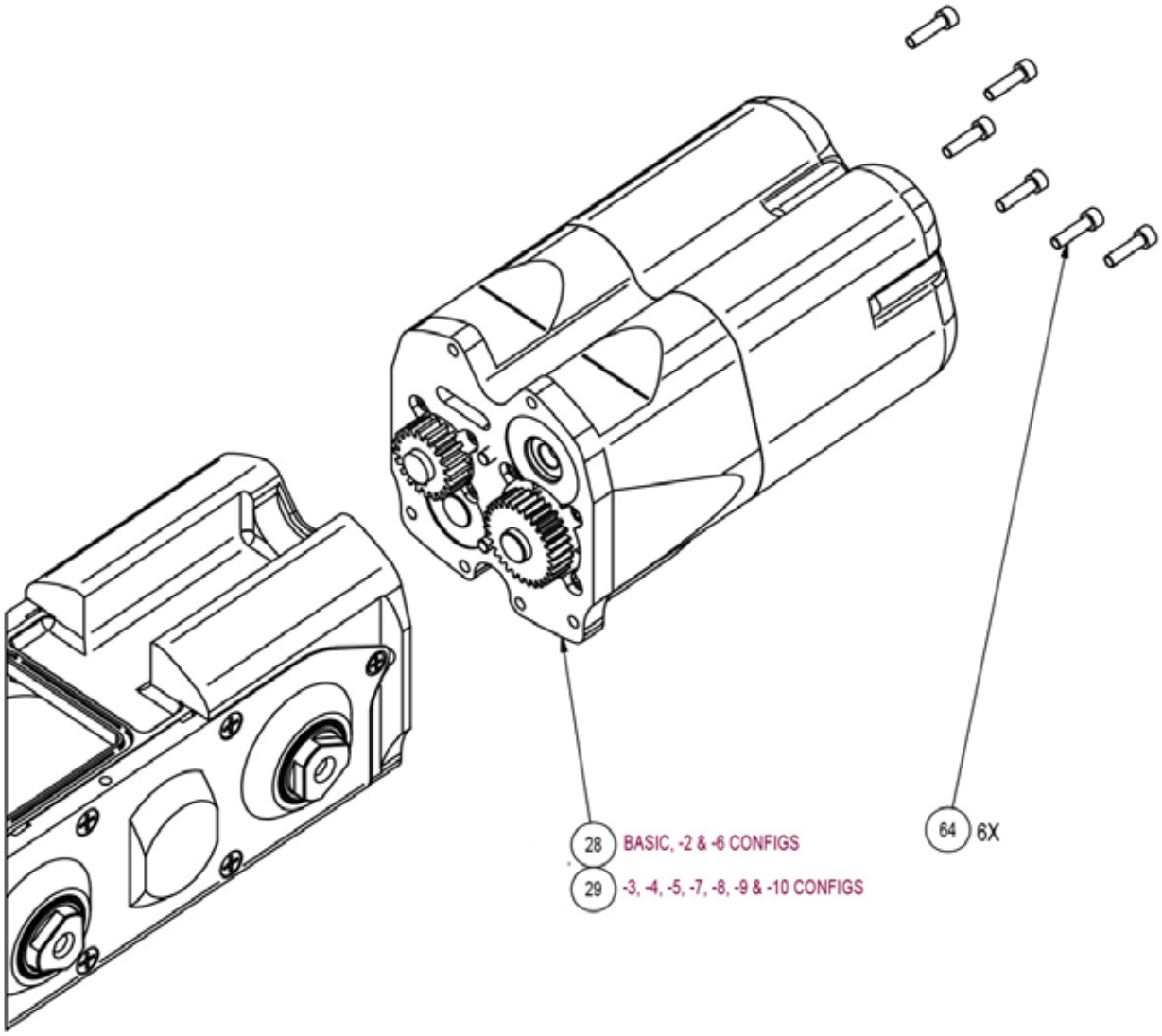


FIGURE 1F. LAMP II,80'PUSH CABLE & SELF UPRIGHT/NTSC, LM350



LAMPII BOM & EXPLODED VIEW DRAWINGS

FIGURE 1G. LAMP II,80'PUSH CABLE & SELF UPRIGHT/NTSC, LM350

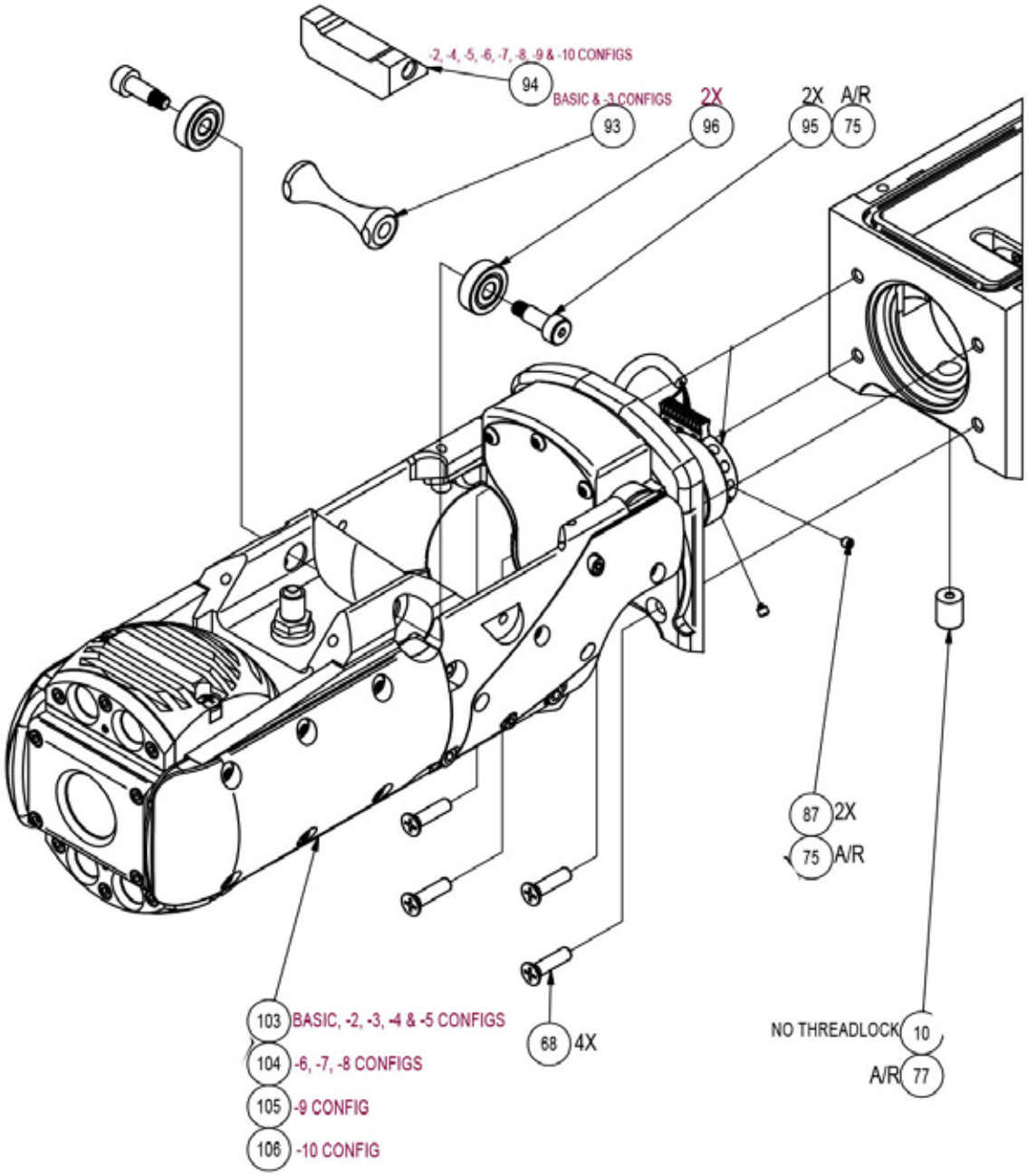
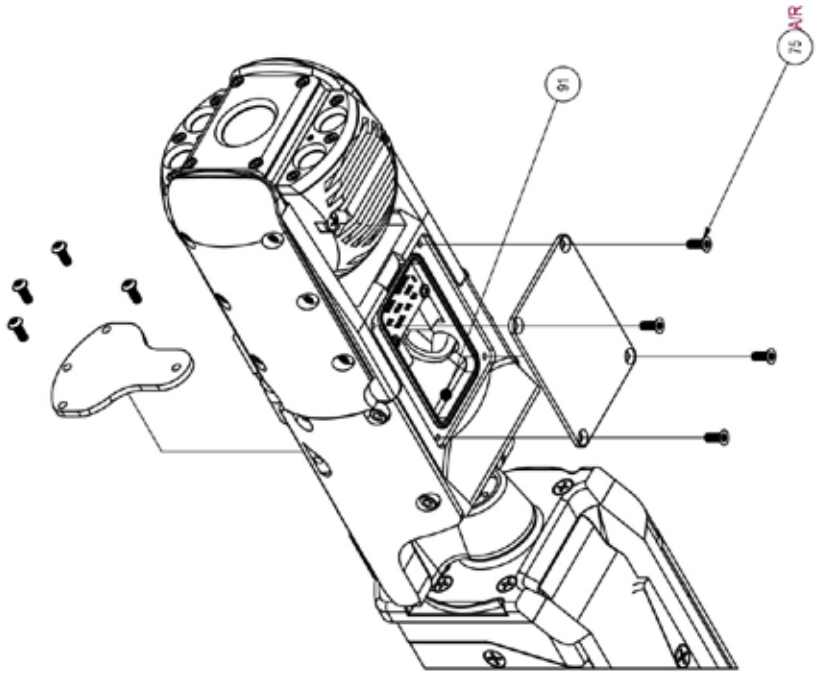
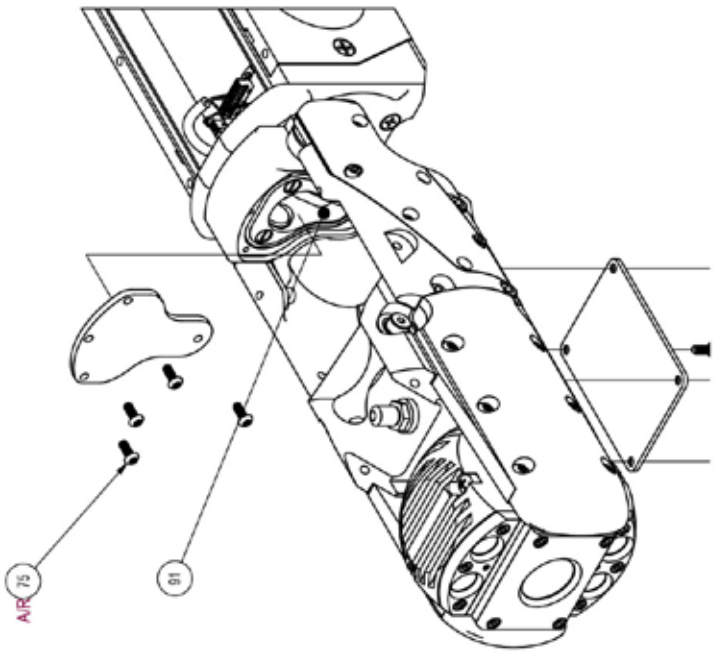


FIGURE 1H. LAMP II,80'PUSH CABLE & SELF UPRIGHT/NTSC, LM350





LAMPII BOM & EXPLODED VIEW DRAWINGS

FIGURE 1I. LAMP II,80'PUSH CABLE & SELF UPRIGHT/NTSC, LM350

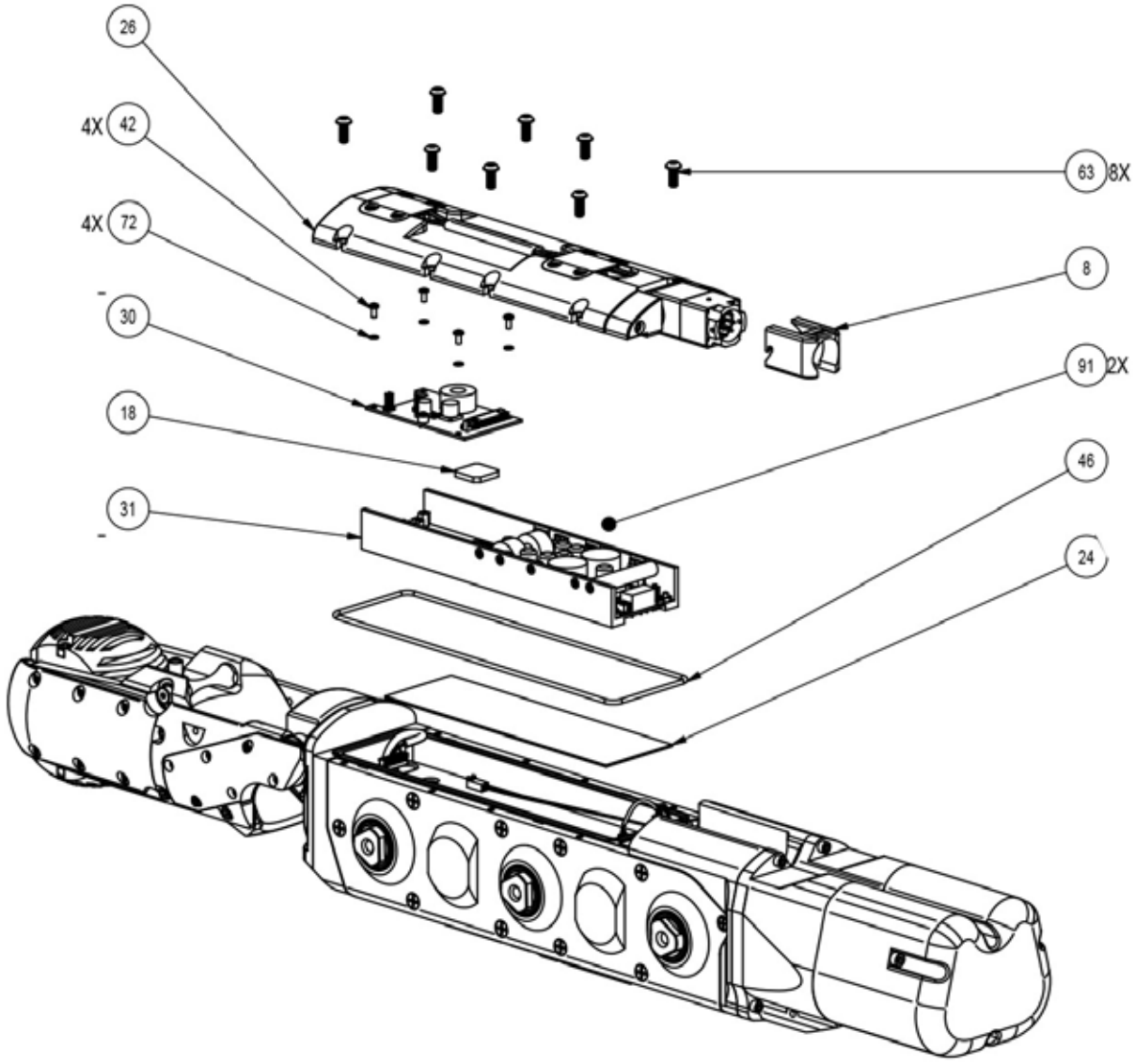
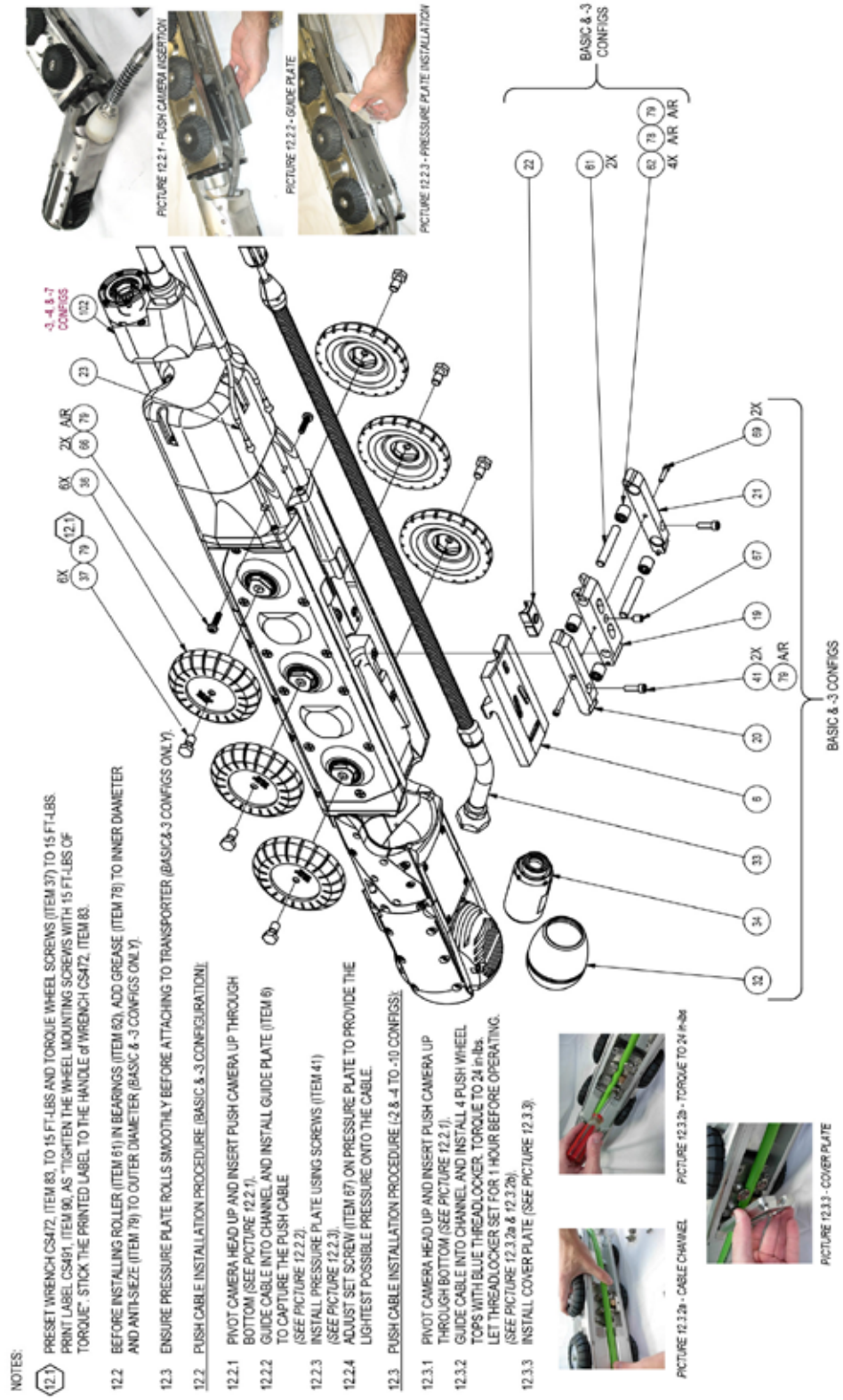


FIGURE 1J. LAMP II,80'PUSH CABLE & SELF UPRIGHT/NTSC, LM350



LAMPII BOM & EXPLODED VIEW DRAWINGS

>SPRING PUSH CABLE OPTION

LAMP II,80'PSH CBL&SLF UPR/SND/NTSC (See Figure 1), Rev. X, LM350

ITEM #	DESCRIPTION	P/N	QTY
0001	HOUSING,ROTATE MOTOR	LM011	1
0002	GEAR,SPUR,30TEETH,SPLINED,LAMPII	LM024	1
0003	PLATE,PUSH CABLE GUIDE,UPPER	LM027	1
0004	DRIVESHAFT,PUSH DRIVE,LAMP II	LM031	1
0005	SHAFT,WORM DRIVE,LAMPII	LM039	1
0006	GUIDE,PUSH,LOWER,LAMPII	LM042	1
0008	CONNECTOR,QUICK,12PIN,LAMP II/CPR	LM074	1
0009	AXLE,FRONT & INTERMEDIATE,LAMPII	LM075	4
0010	HALL SENSOR MAGNET ASSY,SHORT	LM076-1	1
0011	WASHER,THRUST,DRIVE,BIG,LAMP II	LM107	1
0012	AXLE,REAR,LAMPII	LM108	2
0013	HOUSING,AXLE BEARING,LAMPII	LM109	1
0014	MAIN BODY,LAMP II	LM110	1
0015	COVER,SIDE,RH,LAMP II	LM111	1
0016	COVER,SIDE,LH,LAMPII	LM112	1
0017	MOTOR/GEARBOX,,22V,1093:1,LAMPII	LM116	1
0018	MICROCNTRL,PRG,F/LM403,LAMP II	LM148	1
0019	PLATE,PRESSURE,SIDE 1,LAMPII	LM151	1
0020	PLATE,PRESSURE,SIDE 2,LAMPII	LM152	1
0021	PLATE,PRESSURE,SIDE 3,LAMPII	LM153	1
0022	WEARSTRIP,PSH CBL,SHRT,LMPII BRNZ	LM154-1	1
0023	CABLE,TOW,LAMPII	LM157	1
0024	PAD,THERMALLY CONDUCTIVE,LAMPII	LM158	1
0025	CLUTCH ASSY,LAMP II	LM327	1
0026	COVER ASSY,ELECTRONICS BAY	LM304	1
0027	PUSH DRIVE ASSY,LAMP II	LM319	1
0028	CAMERA HEAD ASSY,W/LAUNCHER,LAMPII	LM325	1
0029	MOTOR ASSY,LAMP II	LM330	1
0030	PCB ASSY,MODEM & VIDEO,MC,LAMP II	LM401	1
0031	PCB ASSY,CONTROL,LAMP II	LM403	1
0032	BALL,CENTERING,2PC,ROUNDER	LM299	1
0033	CABLE ASSY,PUSH,80FT,LMP,0.24 ARMOR	LT603	1
0034	CAMERA ASSY,SELF UP,NTSC,SND,60°HI	SR300-11	1
0035	GEARED SHAFT,IDLER,CPR	WM279	4
0036	WHEEL,RBR,75D,6",H-BTM CLR,CPR&LMII	WM209	6
0037	SCREW,CAPT,HEX,5/16-24UNF X 0.625	WM098-1	6
0038	O-RING,MOLDED,UNIBODY SIDE PLATE	WM101	2

LAMP II,80'PSH CBL&SLF UPR/SND/NTSC (See Figure 1), Rev. X, LM350			
ITEM #	DESCRIPTION	P/N	QTY
0040	SCREW,CAP,SKT HD,10-32X1-3/4LG,SST	HW118	1
0041	SCREW,CAP,SOC HEAD,10-32X5/8,SST	HW134	2
0042	SCREW,PAN,4-40X1/4 MACHINE	HW227	4
0043	BEARING,THRUST,BRONZ,.502X.753X1/16	HW321	1
0044	SCREW,CAP HD,10-32X2-3/4LG,SST	HW362	3
0045	BEARING,BALL,9X17X5,SEALED	HW457	1
0046	O-RING,2-168,BUNA	HW617	1
0047	SCREW,BUTTON HD 6-32X5/16 SST SKT	HW770	3
0048	O-RING,2-044 BUNA	HW802	1
0049	SCREW,SHCS,M3 X 7MM LG,18-8SST	HW2387	4
0050	BEARING,BALL,25MM ID X32ODX4MM,SEAL	HW1562	4
0051	SEAL,25ID X 32OD X 4MM W,RUBBER	HW1563	6
0052	BEARING,BALL,20MM IDX27ODX4MM,SEAL	HW1565	4
0054	BEARING,NEEDLE,15MM X 21MM X12MM	HW1757	1
0055	O-RING,2-045,BUNA-N,SHORE A70	HW1828	1
0056	BEARING,THRUST,1.00 OD X .50 ID	HW1832	1
0057	SCREW,FLAT,8-32X.313,PHIL,SS	HW1846	2
0058	RING,RTG,EXT,SNP,1/2DIA SS,	HW1898	2
0059	BEARING,BALL,37MMX25MMX7MM	HW1921	6
0060	SEAL,SHAFT,OIL,12MMX16MMX3MM	HW1519	1
0061	PIN,DOWEL,8MMX50MM HARD STEEL	HW1979	2
0062	BEARING,NEEDLE,8MMX12MMX10MM W	HW1980	4
0063	SCREW,BTNHD,PIN-IN-TRX,10-32X.50,SS	HW2058	8
0064	SCREW,CAP,SKT HD,8-32X5/8,SST	100141	6
0065	SCREW,FLAT,8-32X3/8 PHIL SST	100146	6
0066	SCREW,PAN,10-32X3/4 PHIL SST	101028	2
0067	SCREW,SET,1/4-20X3/8 KNURL PLATED	101052	1
0068	SCREW,FLAT,10-32X3/4 PHIL SST	101075	4
0069	SCREW,CAP,SKT HD,#6-32X5/8 LONG	101136	2
0070	SCREW,FLAT,10-32X1/2 SST	103052	18
0071	SCREW,FLAT,10-32X7/8,PHILLIP,SS	712444	4
0072	WASHER,SPLIT #4 STL	712462	4
0073	O-RING,2-020 BUNA	712494	1
0074	MRO-LUBRICANT,O-RING 2 OZ TUBE	439986	1
0075	MRO-REMOVABLE LCK,ND 121200-50,BLUE	440061	1
0076	MRO-RET.COMP,.005GP,ND530125-50,GRN	440072	1
0077	MRO-SEALANT,THREAD PST 567	CS215	1

LAMPII BOM & EXPLODED VIEW DRAWINGS

>SPRING PUSH CABLE OPTION

LAMP II,80'PSH CBL&SLF UPR/SND/NTSC (See Figure 1), Rev. X, LM350			
ITEM #	DESCRIPTION	P/N	QTY
0079	MRO-ANTI-SEIZE,LPS NICKEL,P/N 03908	CS407	1
0080	LABEL,THERMAL XFR,1.500"W X .500"H	CS221	1
0081	LABEL,LASERTAB MARKER, .560 X .560	CS222	2
0082	MANUAL,LAMP II, 060115	LM903	1
0083	TOOL,3/8"DR TRQ WRNCH,MICROMTR ADJ	CS472	1
0084	TOOL,3/8DR,1/2"X6POINT SOCKET	CS486	1
0085	TOOL,3/8"DR,1/4"HEX BIT SOCKET	CS474	1
0086	MRO-GOOP,AUTOMOTIVE 3.7 OZ TUBE	420802	1
0087	SCREW,SET,6-32X1/8 SST BRASS TIP	100172	2
0088	SEAL,OIL,15X21X3MM,DBL LIP	HW2098	1
0089	ANTI-SEIZE,BRSH,NICKL GRAF,2 OZ	CS488	1
0090	LABEL,1-1/8"X3-1/2",AVERY 4150	CS491	1
0091	DESSICANT,.25G	MS116	4
0093	ROLLER,CHUTE,LAMPII	LM122	1
0095	SCREW,SHLDR,6X12XM5,SST	HW1953	2
0096	BEARING,6X19X6MM,ABEC1,DBL SEALED	HW1955	2
0097	RING,RETAIN.,SPIRAL,.500ID,.035 THK	HW605	1
0099	MRO-CLEANER,CONTACT,DEOXIT GLD,25ML	CS498	1
0200	HOUSING,2-PIN,2MM	712864	1
0201	WIRE,#24 BLACK TEFLON	713335	1
0202	WIRE,#24 RED TEFLON	713337	1
0203	CONTACT	715087	2
0204	TUBE,SHRINK,1/16"	712593	1
0205	TUBE,SHRINK,RED 1/8"RNF	712580	1

LAMP II,ALT PSH DR,NO CAM&PSH CBL, Rev. X, LM350-2			
ITEM #	DESCRIPTION	P/N	QTY
0001	HOUSING,ROTATE MOTOR	LM011	1
0002	GEAR,SPUR,30TEETH,SPLINED,LAMPII	LM024	1
0004	DRIVESHAFT,PUSH DRIVE,LAMP II	LM031	1
0005	SHAFT,WORM DRIVE,LAMPII	LM039	1
0008	CONNECTOR,QUICK,12PIN,LAMP II/CPR	LM074	1
0009	AXLE,FRONT & INTERMEDIATE,LAMPII	LM075	4
0010	HALL SENSOR MAGNET ASSY,SHORT	LM076-1	1
0011	WASHER,THRUST,DRIVE,BIG,LAMP II	LM107	1
0012	AXLE,REAR,LAMPII	LM108	2
0013	HOUSING,AXLE BEARING,LAMPII	LM109	1
0014	MAIN BODY,LAMP II	LM110	1
0015	COVER,SIDE,RH,LAMP II	LM111	1
0016	COVER,SIDE,LH,LAMPII	LM112	1
0017	MOTOR/GEARBOX,,22V,1093:1,LAMPII	LM116	1
0018	MICROCNTRL,PRG,F/LM403,LAMP II	LM148	1
0023	CABLE,TOW,LAMPII	LM157	1
0024	PAD,THERMALLY CONDUCTIVE,LAMPII	LM158	1
0025	CLUTCH ASSY,LAMP II	LM327	1
0026	COVER ASSY,ELECTRONICS BAY	LM304	1
0028	CAMERA HEAD ASSY,W/LAUNCHER,LAMPII	LM325	1
0029	MOTOR ASSY,LAMP II	LM330	1
0030	PCB ASSY,MODEM & VIDEO,MC,LAMP II	LM401	1
0031	PCB ASSY,CONTROL,LAMP II	LM403	1
0035	GEARED SHAFT,IDLER,CPR	WM279	4
0036	WHEEL,RBR,75D,6",H-BTM CLR,CPR&LMII	WM209	6
0037	SCREW,CAPT,HEX,5/16-24UNF X 0.625	WM098-1	6
0038	O-RING,MOLDED,UNIBODY SIDE PLATE	WM101	2
0039	BEARING,BUSH,OUTER,CLUTCH,CPR	WM219	6
0042	SCREW,PAN,4-40X1/4 MACHINE	HW227	4
0043	BEARING,THRUST,BRONZ,.502X.753X1/16	HW321	1
0044	SCREW,CAP HD,10-32X2-3/4LG,SST	HW362	3
0045	BEARING,BALL,9X17X5,SEALED	HW457	1
0046	O-RING,2-168,BUNA	HW617	1
0047	SCREW,BUTTON HD 6-32X5/16 SST SKT	HW770	3
0048	O-RING,2-044 BUNA	HW802	1
0049	SCREW,SHCS,M3 X 7MM LG,18-8SST	HW2387	4
0050	BEARING,BALL,25MM ID X32ODX4MM,SEAL	HW1562	4
0051	SEAL,25ID X 32OD X 4MM W,RUBBER	HW1563	6

LAMPII BOM & EXPLODED VIEW DRAWINGS

LAMP II,ALT PSH DR,NO CAM&PSH CBL, Rev. X, LM350-2			
ITEM #	DESCRIPTION	P/N	QTY
0054	BEARING,NEEDLE,15MM X 21MM X12MM	HW1757	1
0055	O-RING,2-045,BUNA-N,SHORE A70	HW1828	1
0056	BEARING,THRUST,1.00 OD X .50 ID	HW1832	1
0057	SCREW,FLAT,8-32X.313,PHIL,SS	HW1846	2
0058	RING,RTG,EXT,SNP,1/2DIA SS,	HW1898	2
0059	BEARING,BALL,37MMX25MMX7MM	HW1921	6
0060	SEAL,SHAFT,OIL,12MMX16MMX3MM	HW1519	1
0063	SCREW,BTNHD,PIN-IN-TRX,10-32X.50,SS	HW2058	8
0064	SCREW,CAP,SKT HD,8-32X5/8,SST	100141	6
0065	SCREW,FLAT,8-32X3/8 PHIL SST	100146	6
0066	SCREW,PAN,10-32X3/4 PHIL SST	101028	2
0068	SCREW,FLAT,10-32X3/4 PHIL SST	101075	4
0070	SCREW,FLAT,10-32X1/2 SST	103052	18
0072	WASHER,SPLIT #4 STL	712462	4
0073	O-RING,2-020 BUNA	712494	1
0074	MRO-LUBRICANT,O-RING 2 OZ TUBE	439986	1
0075	MRO-REMOVABLE LCK,ND 121200-50,BLUE	440061	1
0076	MRO-RET.COMP,.005GP,ND530125-50,GRN	440072	1
0077	MRO-SEALANT,THREAD PST 567	CS215	1
0078	MRO-GREASE,MOBIL 1 SYNTHETIC	CS419	1
0079	MRO-ANTI-SEIZE,LPS NICKEL,P/N 03908	CS407	1
0080	LABEL,THERMAL XFR,1.500”W X .500”H	CS221	1
0081	LABEL,LASERTAB MARKER, .560 X .560	CS222	2
0082	MANUAL,LAMP II, 060115	LM903	1
0083	TOOL,3/8”DR TRQ WRNCH,MICROMTR ADJ	CS472	1
0084	TOOL,3/8DR,1/2”X6POINT SOCKET	CS486	1
0085	TOOL,3/8”DR,1/4”HEX BIT SOCKET	CS474	1
0086	MRO-GOOP,AUTOMOTIVE 3.7 OZ TUBE	420802	1
0087	SCREW,SET,6-32X1/8 SST BRASS TIP	100172	2
0088	SEAL,OIL,15X21X3MM,DBL LIP	HW2098	1
0089	ANTI-SEIZE,BRSH,NICKL GRAF,2 OZ	CS488	1
0090	LABEL,1-1/8”X3-1/2”,AVERY 4150	CS491	1
0091	DESSICANT,.25G	MS116	4
0092	PUSH DRIVE ASSY,ALTERNATE,LAMP II	LM331	1
0094	CHUTE,LAMPII,6”,F/ FIBERGLASS CABLE	LM260	1
0095	SCREW,SHLDR,6X12XM5,SST	HW1953	2

LAMP II,ALT PSH DR,NO CAM&PSH CBL, Rev. X, LM350-2			
ITEM #	DESCRIPTION	P/N	QTY
0097	RING,RETAIN.,SPIRAL,.500ID,.035 THK	HW605	1
0098	TOOL,NUT DRIVER,1/4IN	CS501	1
0099	MRO-CLEANER,CONTACT,DEOXIT GLD,25ML	CS498	1
0200	HOUSING,2-PIN,2MM	712864	1
0201	WIRE,#24 BLACK TEFLON	713335	1
0202	WIRE,#24 RED TEFLON	713337	1
0203	CONTACT	715087	2
0204	TUBE,SHRINK,1/16”	712593	1
0205	TUBE,SHRINK,RED 1/8”RNF	712580	1

LAMPII BOM & EXPLODED VIEW DRAWINGS

FIGURE 2A. SPRING ASSY, LATERAL CAMERA,LAMPII, LM335

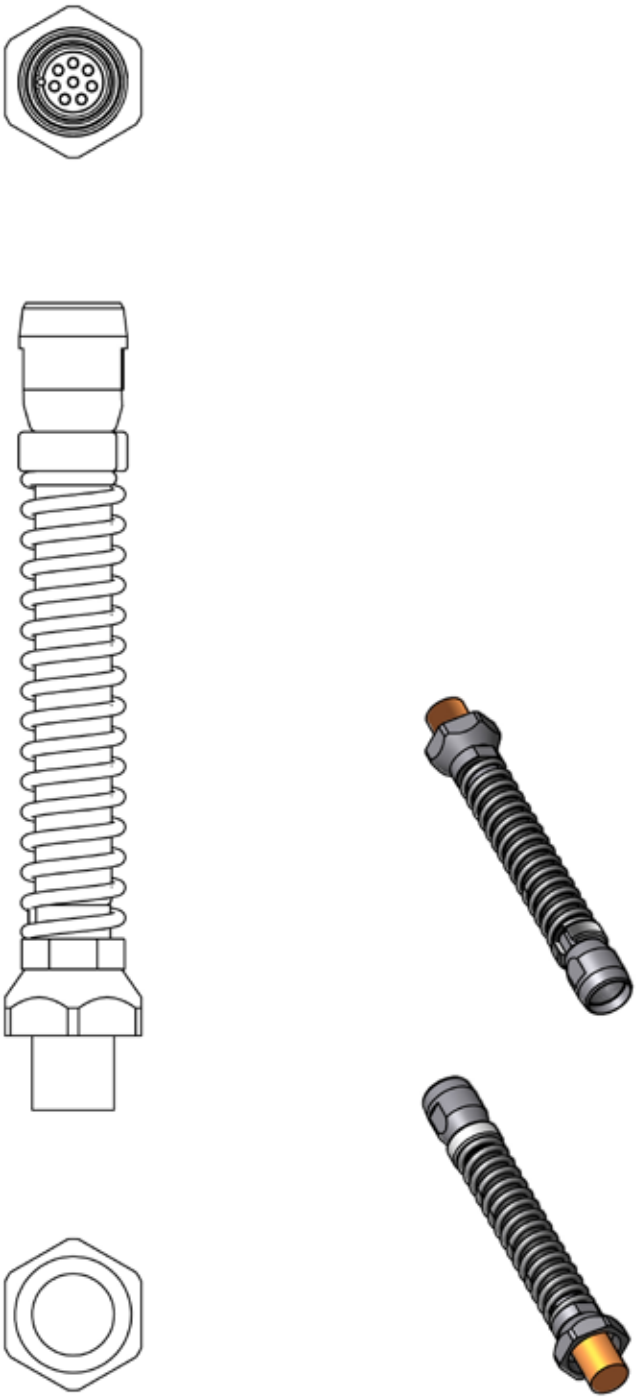
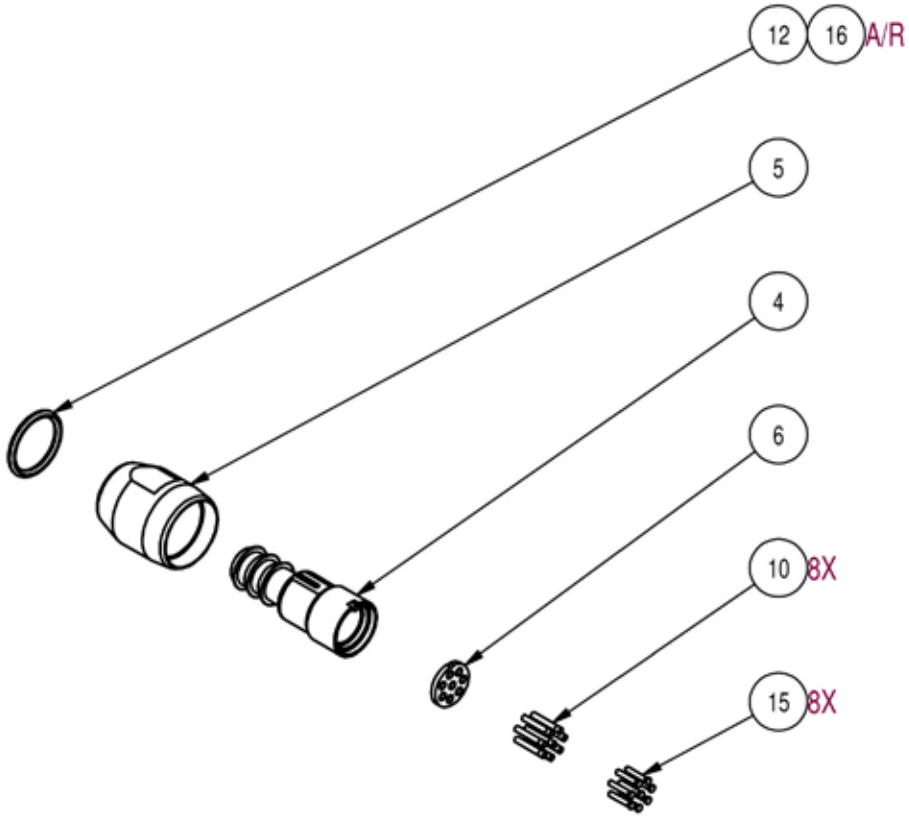
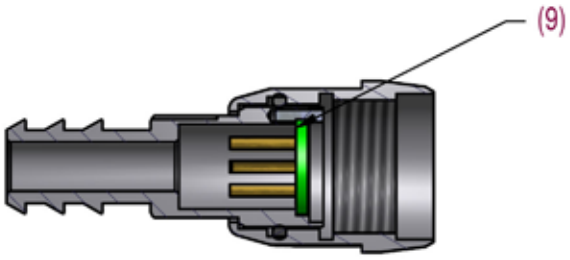


FIGURE 2B. SPRING ASSY, LATERAL CAMERA,LAMPII, LM335



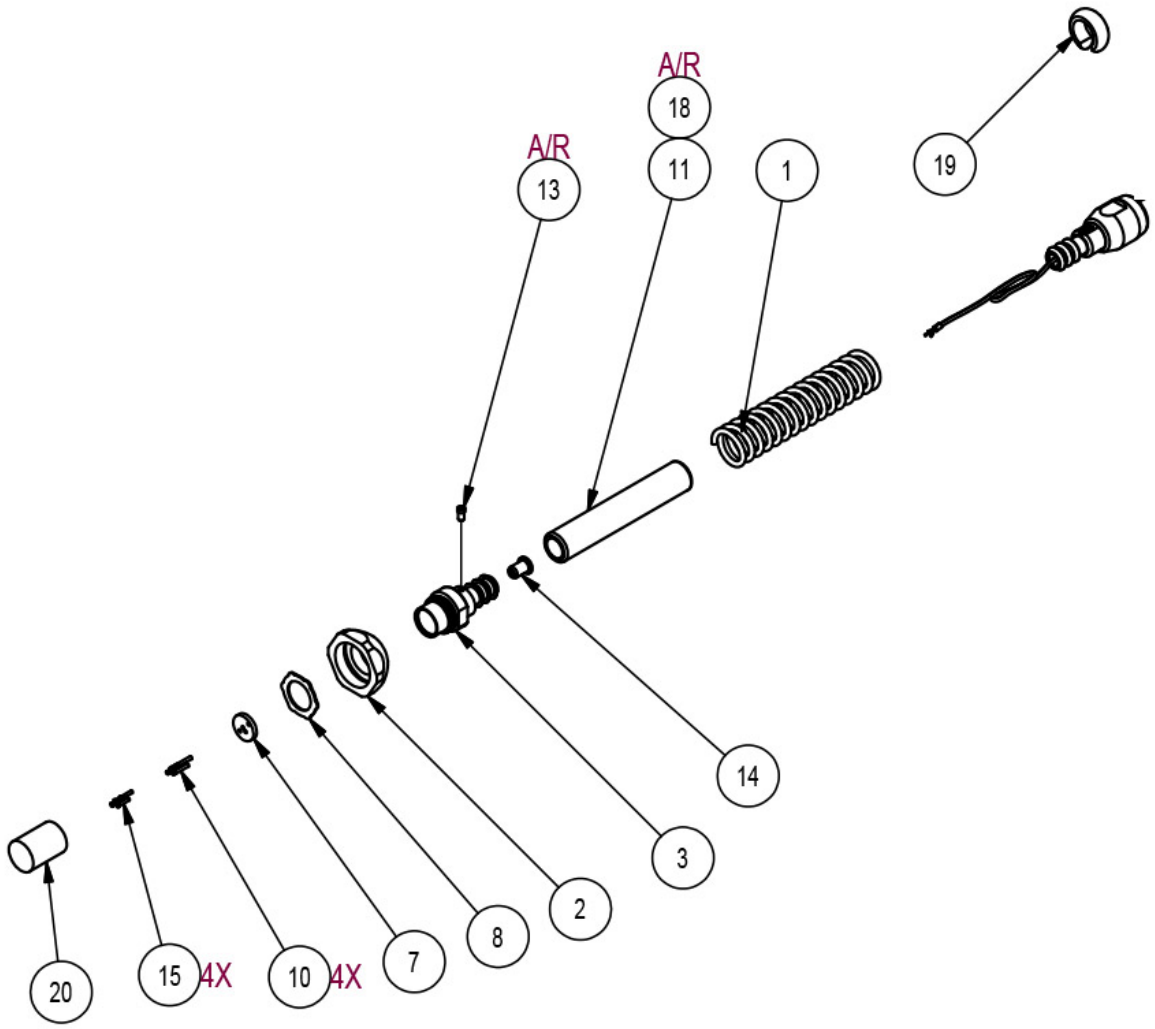


SECTION A-A



LAMPII BOM & EXPLODED VIEW DRAWINGS

FIGURE 2C. SPRING ASSY, LATERAL CAMERA,LAMPII, LM335



SPRING ASSY,LATERAL CAMERA,LAMPII, (See Figure 2), LM335, Rev. D			
ITEM #	DESCRIPTION	P/N	QTY
0001	SPRING,COMP,.859OD X .115WD X 3.75L	LT069	1
0002	NUT,RADIUSED,PUSH CABLE/CAMERA	LM298	1
0003	ADAPTER,PUSH CABLE,CAMERA END,LAMP	LT243	1
0004	ADAPTER,BARBED,SPRING,PSH CBL,LMPII	LM231	1
0005	NUT,CONNECTOR,PUSH CABLE,LAMPII	LM233	1
0006	PCB,RAW,PIN,LATERAL,PUSH CABLE	LM508	1
0007	BOARD,MOUNT,CX1	CR124	1
0008	GASKET,TEFLON,CX1	CR126	1
0009	MRO-EPOXY,5 MIN,FLOW-MIX,14ML,DEVCN	CS492	1
0010	SOCKET,WIRE WRAP,025 SQ	PL131	12
0011	HOSE,PUSH-LOC	HW515	1
0012	O-RING,2-016,BUNA-N	HW691	1
0013	SCREW,BHCS,M3X5MM,SS,MOD	LT709	1
0014	WELL,WIRE,SPRING END,LAMPII	LM280	1
0015	PIN,POGO W/SPRING	1208	12
0016	MRO-LUBRICANT,O-RING 2 OZ TUBE	439986	1
0017	MRO-REMOVABLE LCK,ND 121200-50,BLUE	440061	1
0018	GREASE,ANTI SEIZE 8 LB	420797	1
0019	CLIP,SPACER,SPRING ASSY ONE RAD	LM701	1
0020	CAP,PROTECTION,CONNECTION1	HW947	1
0021	TUBE,SHRINK,BLACK 1/4”RNF	712576	1
0022	TUBE,SHRINK,BLACK 1/4”SCL	712587	1
0023	TUBE,SHRINK,1/16”	712593	1
0024	WIRE,#30 BLACK TEFLON	713205	1
0025	WIRE,#30 GREEN TEFLON	713210	1
0026	WIRE,#30 RED TEFLON	713207	1
0027	WIRE,#30 WHITE TEFLON	713213	1
0028	MRO-LUBRICANT,RUBBER EMULSION	439786	1

LAMPII BOM & EXPLODED VIEW DRAWINGS

FIGURE 3A. LED LIGHTHEAD ASSY,OZ III, MZ302

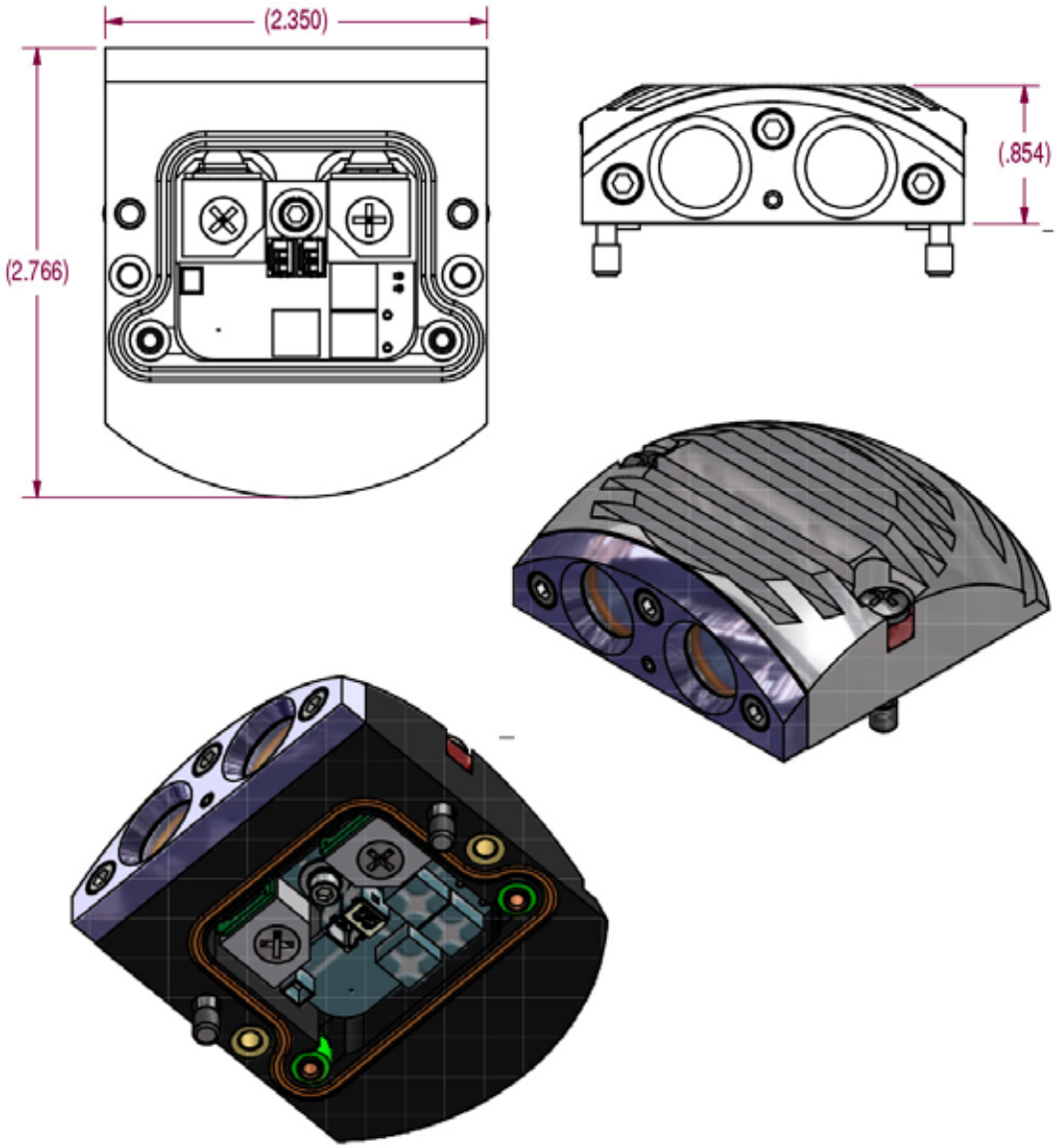
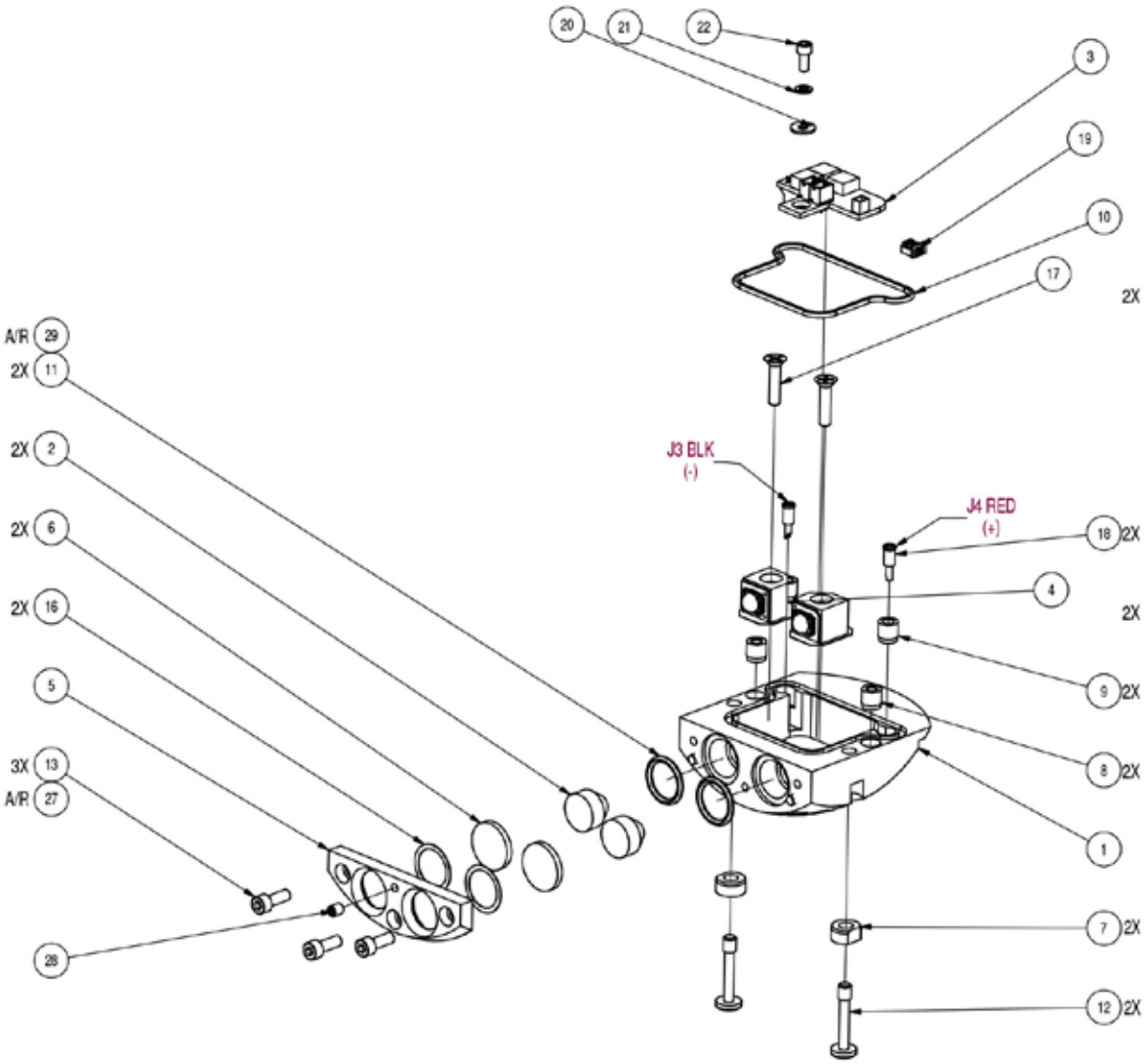


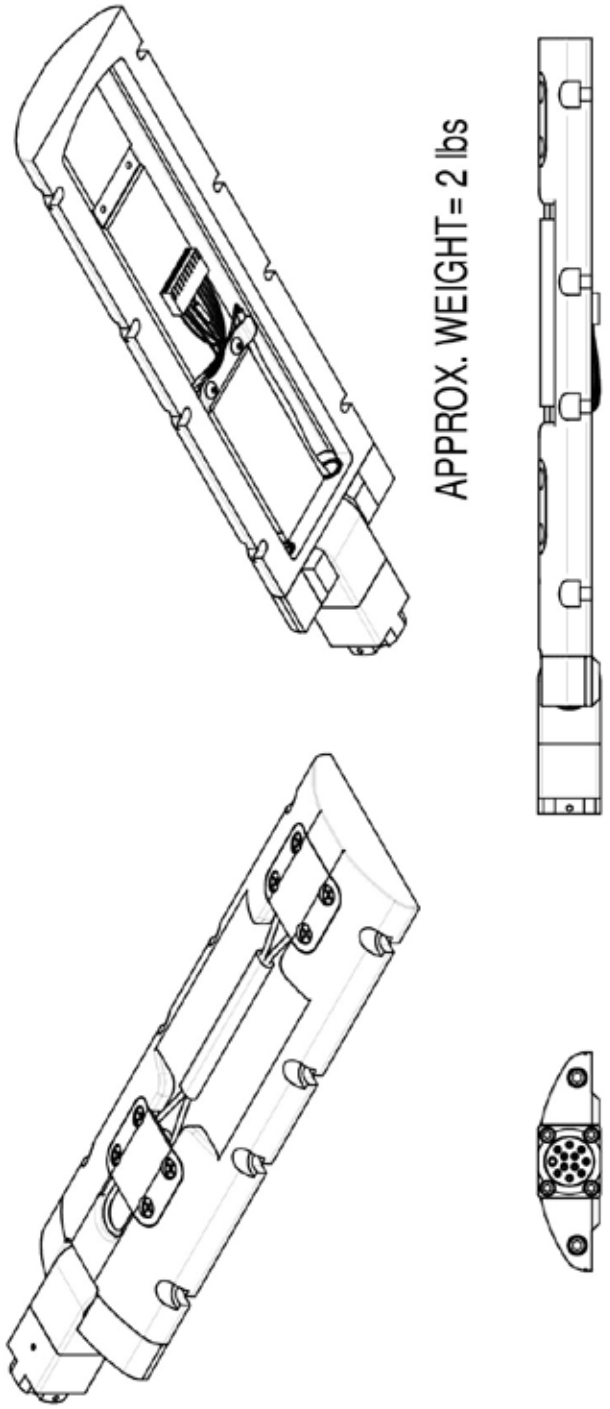
FIGURE 3B. LED LIGHTHEAD ASSY,OZ III, MZ302



LAMPII BOM & EXPLODED VIEW DRAWINGS

LED LIGHTHEAD ASSY,OZ III, (See Figure 3), MZ302, Rev. F			
ITEM #	DESCRIPTION	P/N	QTY
0001	HOUSING,LIGHTHEAD,LED	MZ034	1
0002	COLLIMATOR,LED,MOD,OZ III	MZ140	2
0003	PCB ASSY,UNIVERSAL LED/LSR DR,OZIII	MZ422	1
0004	LED ASSY, BD MOUNT, OZ III	MZ354	2
0005	BEZEL,LIGHTHEAD	MZ004	1
0006	WINDOW,SAPPHIRE,0.625”ODX2MM T,PS3	PS116	2
0007	INSULATOR,THERMAL,CAPTIVE SCREW	MZ018	2
0008	INSULATOR,THRML,1/8 DOWEL PIN,OZ II	CZ014	2
0009	INSULATOR,THRMAL,CONTACT,SCKT,OZ II	CZ012	2
0010	O-RING,MOLDED,LIGHTHEAD,MZ	MZ009	1
0011	O-RING,2-014,SILICONE	HW1361	2
0012	SCREW,CAP,MOD,PH-8-32X7/8 PHIL	HW1362	2
0013	SCREW,CAP,SKT HD,6-32X3/8,SST	105071	3
0016	WASHER,TEFLON,1/2ID X 5/8OD X.01THK	HW1363	2
0017	SCREW,FLAT,6-32X5/8 SST	103021	2
0018	SOCKET,CONTACT	EC125	2
0019	HOUSING,2-PIN,2MM	712864	1
0020	WASHER,FLAT,#4 SST	100171	1
0021	WASHER,SPLIT #4 SST	100170	1
0022	SCREW,CAP,SOC HD 4-40X1/4 SST	103089	1
0023	WIRE,#24 RED TEFLON	713337	1
0024	WIRE,#24 BLACK TEFLON	713335	1
0025	CONTACT	715087	2
0026	TUBE,SHRINK,BLACK 3/32”	712595	1
0027	MRO-REMOVABLE LCK,ND 121200-50,BLUE	440061	1
0028	SCREW,SET,6-32X3/16 SST	100991	1
0029	MRO-LUBRICANT,O-RING 2 OZ TUBE	439986	1

FIGURE 4A. COVER ASSY,ELECTRONICS BAY, LAMP II, LM304



LAMPII BOM & EXPLODED VIEW DRAWINGS

FIGURE 23B. COVER ASSY,ELECTRONICS BAY, LAMP II, LM304

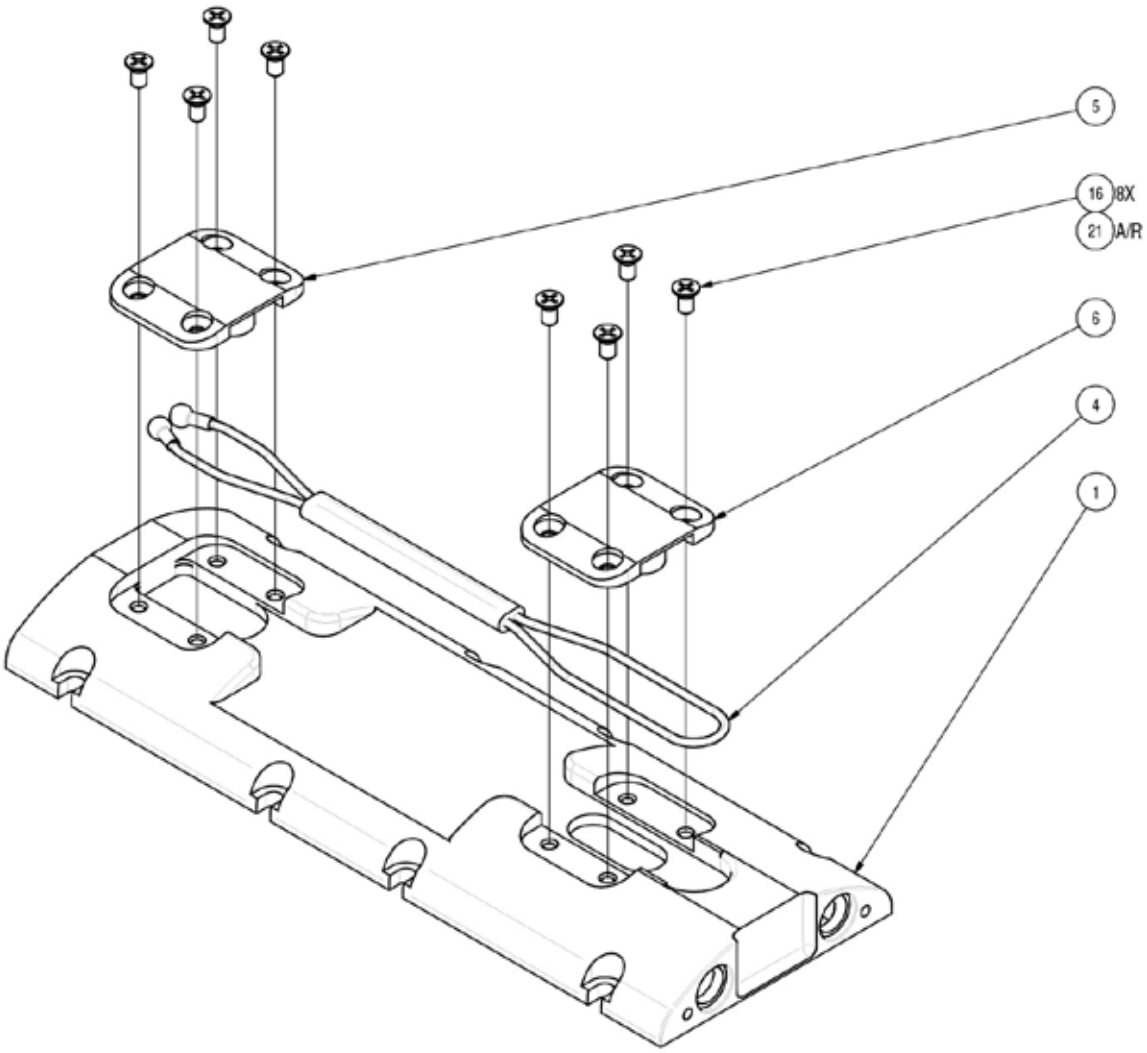
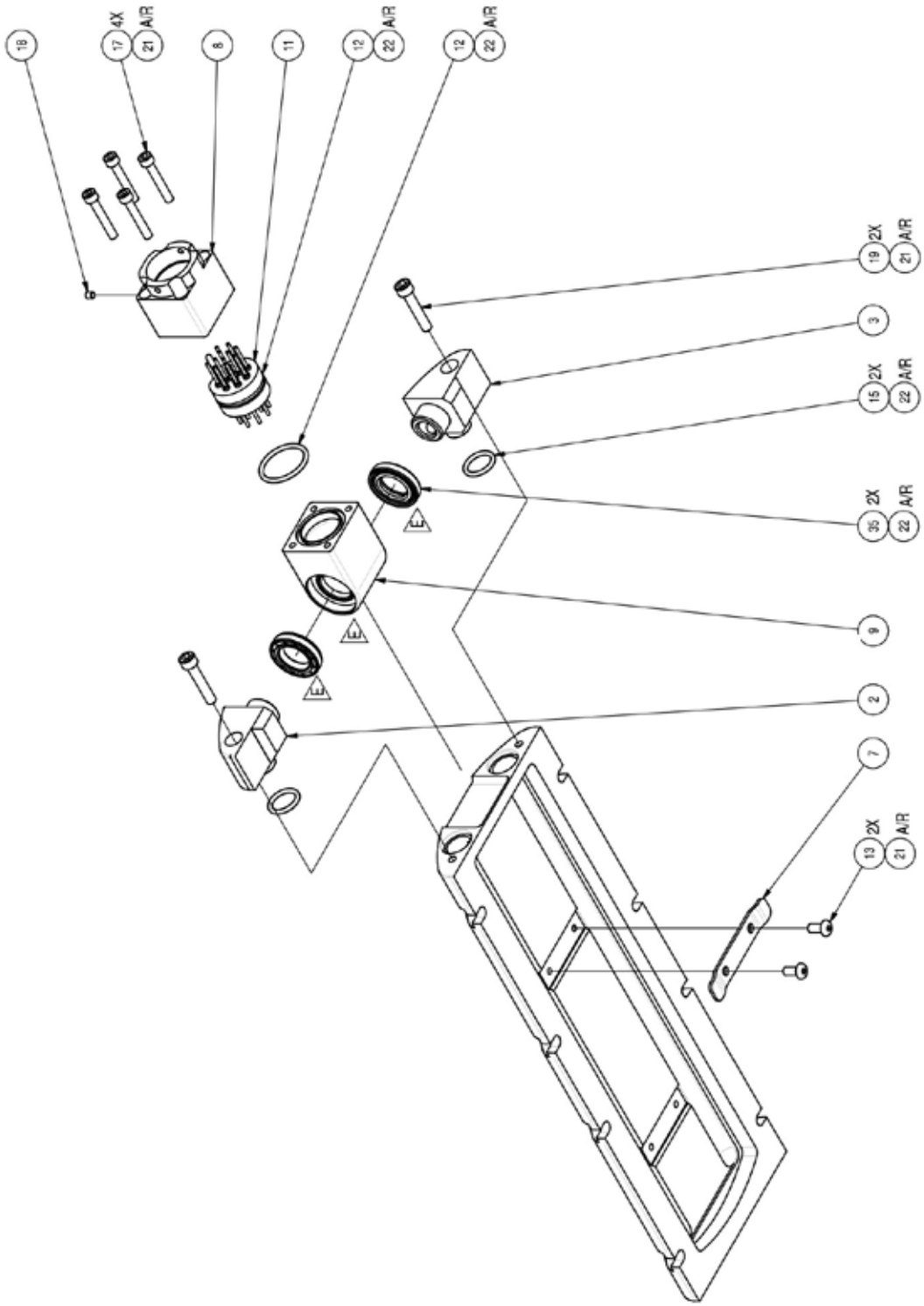


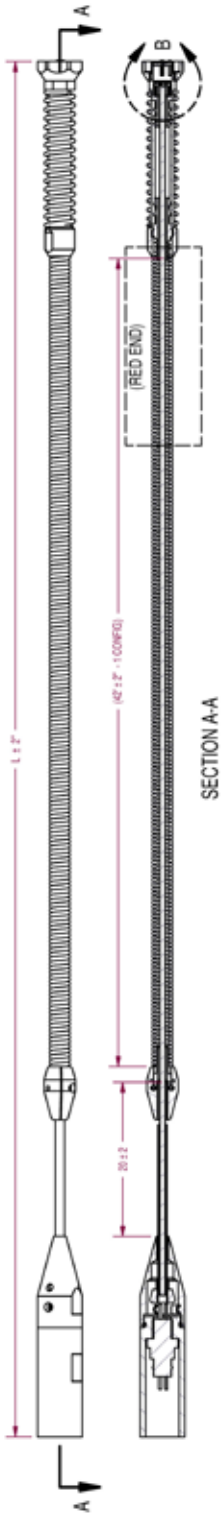
FIGURE 23C. COVER ASSY,ELECTRONICS BAY, LAMP II, LM304



LAMPII BOM & EXPLODED VIEW DRAWINGS

COVER ASSY,ELECTRONICS BAY, LAMP II, (See Figure 4), LM304, Rev. E			
ITEM #	DESCRIPTION	P/N	QTY
0001	COVER,ELECTRONIC BAY,THK WALL,LMPII	LM750	1
0002	CLEVIS,HARNESS CONN, MODIFIED (L)	LM751	1
0003	CLEVIS,HARNESS CONN, MODIFIED (R)	LM751-1	1
0004	CABLE ASSY,RETRIEVAL,LAMPII	LM032	1
0005	RETAINER,CABLE,FRONT,LAMPII	LM033	1
0006	RETAINER,CABLE,REAR,LAMPII	LM034	1
0007	RETAINER,CABLE,COVER,ELEC BY,LAMPII	LM043	1
0008	CAP,SWIVEL,MML	WM014	1
0009	HOUSING,SWIVEL,REAR,12-PIN	WM018	1
0011	PLUG,FEMALE,12 PIN	WT038	1
0012	O-RING,2-018,SILICONE	HW683	2
0013	SCREW,BUTTON HD 6-32X5/16 SST SKT	HW770	2
0015	O-RING,2-013,SILICONE	HW1658	2
0016	SCREW,FLAT,8-32X.313,PHIL,SS	HW1846	8
0017	SCREW,CAP,SKT HD,#6-32X.88LG SST	100128	4
0018	SCREW,SET,4-40X1/8 SST	100050	1
0019	SCREW,CAP,SKT HD,8-32X7/8,SST	103067	2
0020	HOUSING,10PIN LOCKING,MOLEX	EL974	1
0021	MRO-REMOVABLE LCK,ND 121200-50,BLUE	440061	1
0022	MRO-LUBRICANT,O-RING 2 OZ TUBE	439986	1
0023	MRO-GREASE,MOBIL 1 SYNTHETIC	CS419	1
0024	WIRE,#22AWG,ORG/GRN,TWISTED PAIR	EC1739	1
0025	WIRE,#22AWG,(RED/BLK)(BLK/WHT)TP	EC1740	1
0026	WIRE,#24(WHT/RED)(WHT/BLK),TP	EC1741	1
0027	WIRE,#22AWG,RED/BLK,TWISTED PAIR	EC1738	1
0028	CABLE,TEFLON COAX	713362	1
0029	MRO-TAPE,LACING-SPOT TIE NYLON	150007	1
0030	TUBE,SHRINK,RED 3/16”RNF	712591	1
0031	TUBE,SHRINK,1/16”	712593	1
0032	TUBE,SHRINK,BLACK 3/32”	712595	1
0033	TUBE,SHRINK,BLACK 1/8”	712789	1
0034	TERMINAL,CRIMP 22-30 GAUGE WIRE	730113	10
0035	SEAL,SHAFT,2 LIP,.562X.875X.187,NBR	HW2845	2

FIGURE 5A. CABLE ASSY,PUSH,80FT,LMP,0.24 ARMOR, LAMP II, LT603

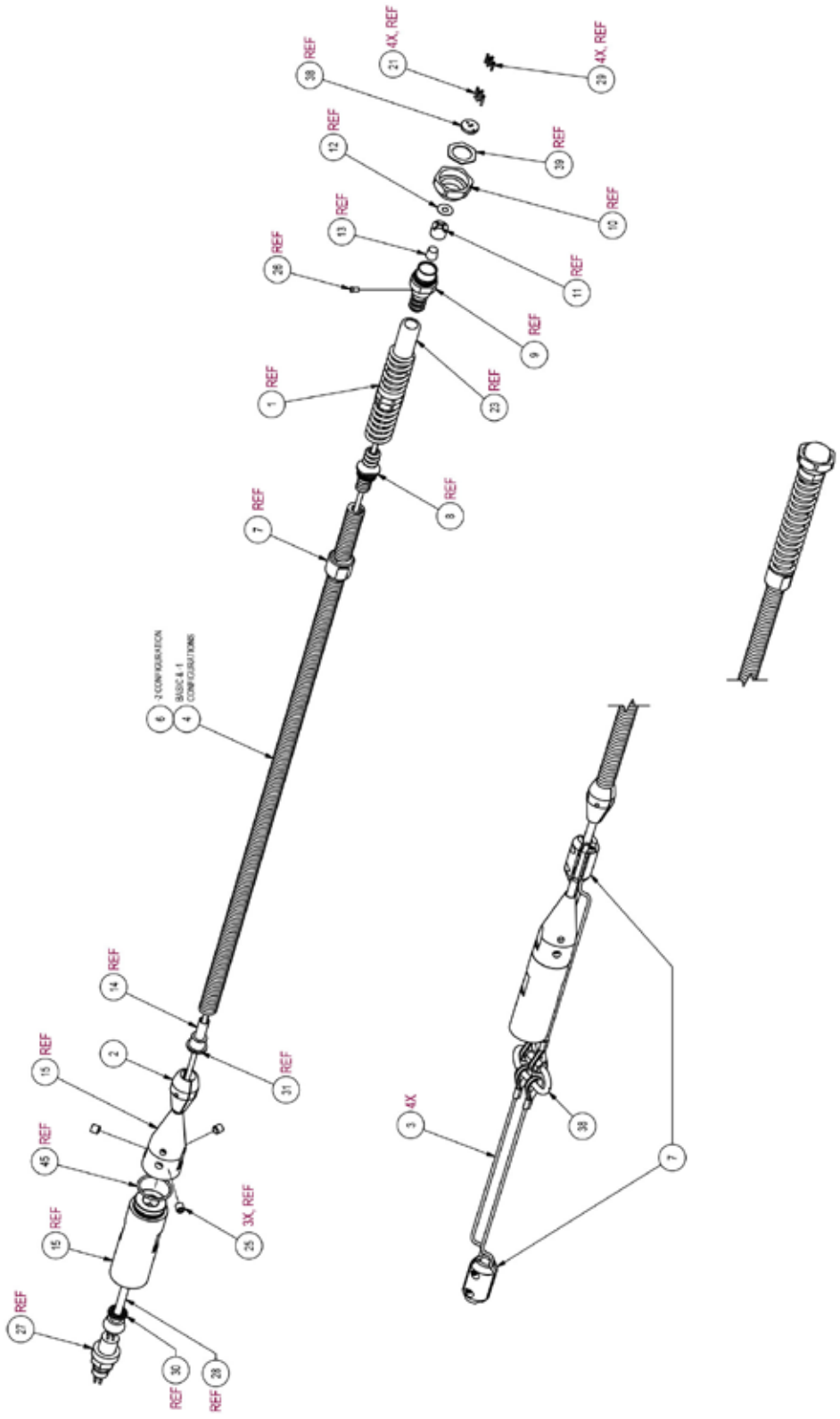


CONFIGURATION LIST

PART NO.	DESCRIPTION	"L" IN FT & IN
LT603	CABLE ASSY, PUSH, 80FT, LMP, 0.24 ARMOR	85 & 4
LT603-1	CABLE ASSY, PUSH, 40FT, LMP, 0.24 ARMOR	45 & 4
LT603-2	CABLE ASSY, PUSH, 100FT, LMP, 0.24 ARMOR	105 & 4
LT603-3	CABLE ASSY, PUSH, 50FT, LMP, 0.24 ARMOR	55 & 4
LT603-4	CABLE ASSY, PUSH, 68FT, LMP, 0.24 ARMOR, MIN	73 & 4
LT603-5	CABLE ASSY, PUSH, 90FT, LMP, 0.24 ARMOR	95 & 4
LT603-6	CABLE ASSY, PUSH, 120 FT, LMP, 0.24 ARMOR	125 & 4

LAMPII BOM & EXPLODED VIEW DRAWINGS

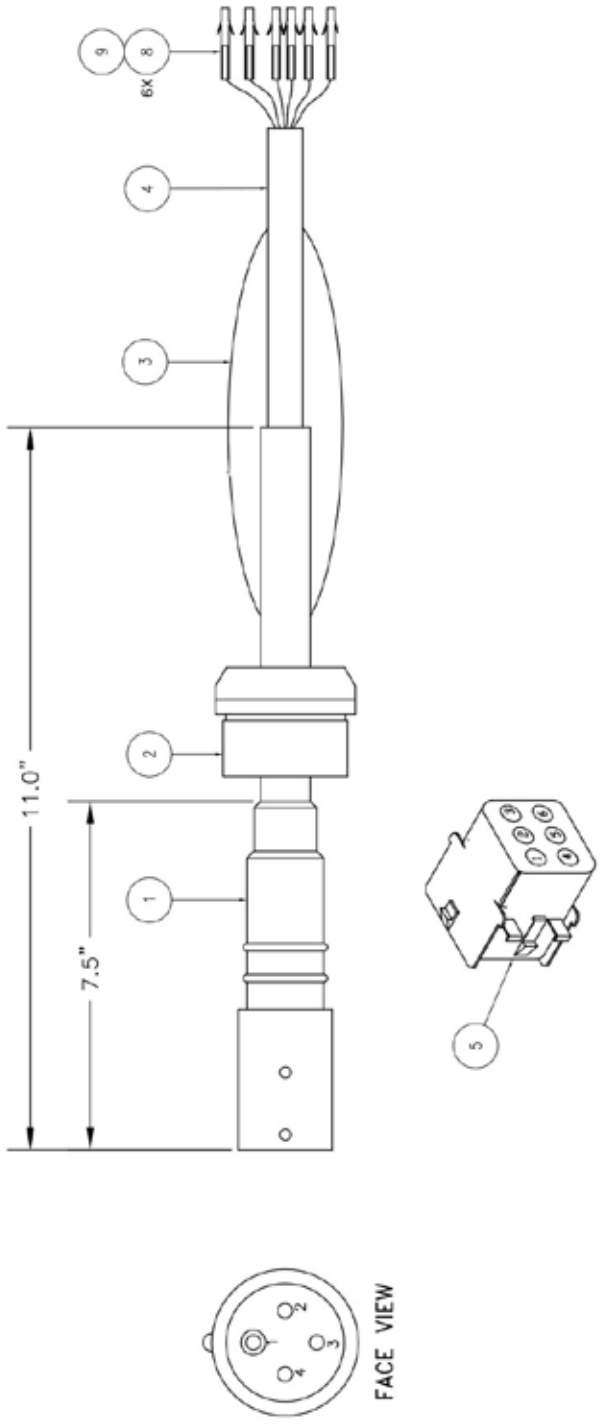
FIGURE 5B. CABLE ASSY,PUSH,80FT,LMP,0.24 ARMOR, LAMP II, LT603



CABLE ASSY,PUSH,80FT,LMP,0.24 ARMOR, LAMP II, (See Figure 5), LT603, Rev. J			
ITEM #	DESCRIPTION	P/N	QTY
0002	END,PROFILED,SPRING CABLE,LAMP	LT090	1
0003	TOW CABLE,12",PUSHCABLE,LAMP	LT150	4
0004	SPRING,CABLE,PUSH,80',LAMP	LT151	1
0006	STRAIN RELIEF,CLAMSHELL,PUSHCA,LAMP	LT152	2
0017	CABLE ASSY,INNER ARMORED,87FT	LT623	1
0022	KIT,REPAIR,PSHCBL,4PIN END,LMP,0.24	RP120	1
0033	MRO-REMOVABLE LCK,ND 121200-50,BLUE	440061	1
0034	TUBE,SHRINK,BLACK 3/32"	712595	1
0036	TUBE,SHRINK,BLACK 1/8"	712789	1
0037	RING-D,CHAIN,TOW CABLE,3/16"SS	712799	1
0040	MRO-RET.COMP,.015GP,ND541200-50,GRN	CS092	1

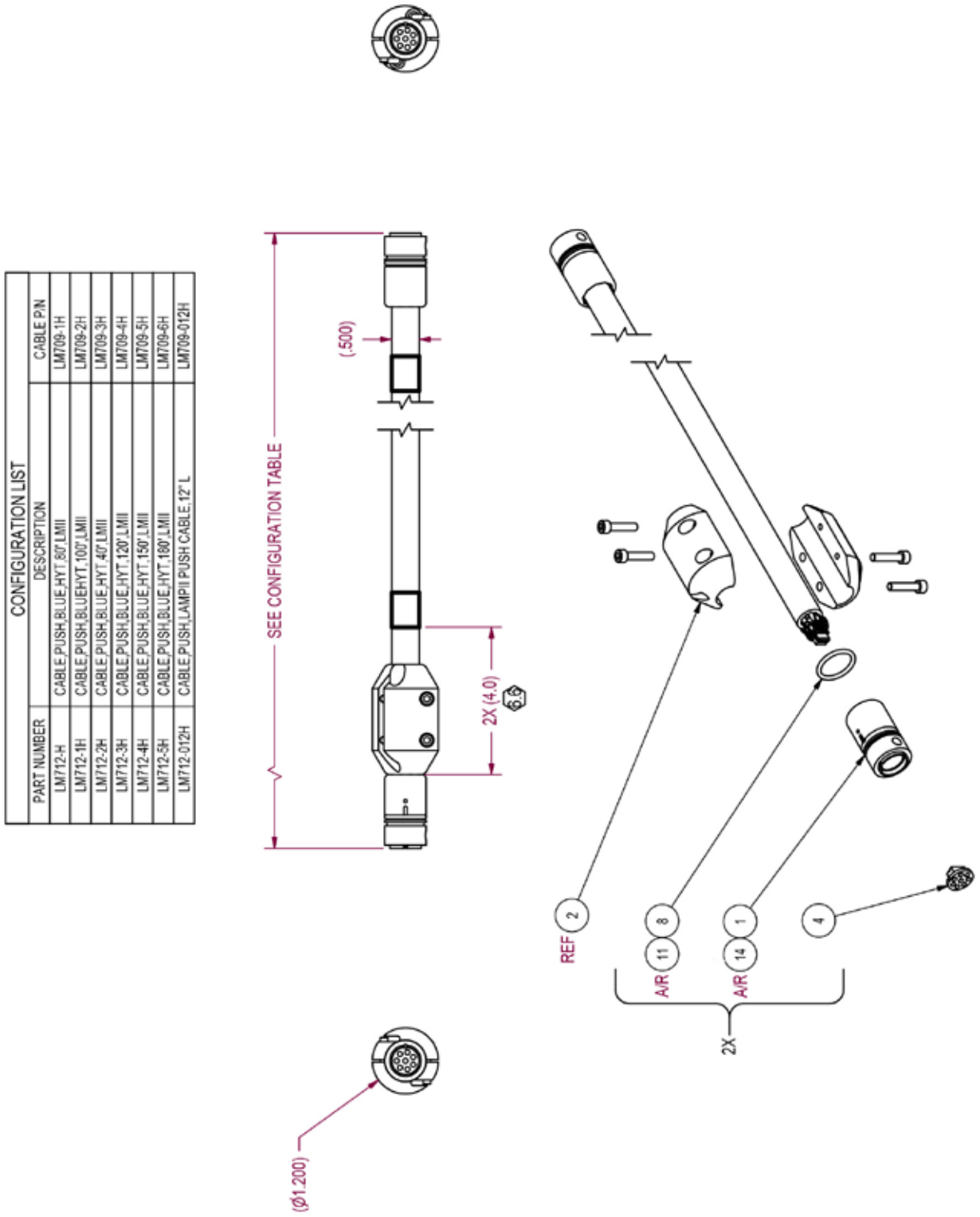
LAMPII BOM & EXPLODED VIEW DRAWINGS

FIGURE 6. CABLE ASSY,CAMERA,LATERAL 1,000', LT318



CABLE ASSY,CAMERA,LATERAL 1,000', See Figure 27, LT318, Rev. F			
0001	PIGTAIL,4-PIN FEMALE	160534	1
0002	NUT,CAPTURE,LATERAL CABLE	LT363	1
0003	KIT,SCOTCHCAST,.25"-.80 DIA CABLE	EL220	1
0004	CABLE,4COND,1COAX,22AWG,RED	EC449	1000
0005	CONN,RECEPT,W/6-PINS	712607	1
0006	WIRE,#20 BLACK STRANDED 600V	713317	1
0007	WIRE,#20 WHITE BU	713326	1
0008	PIN,BRASS F/WIRE SIZE 20-14	712612	6
0009	TUBE,SHRINK,BLACK 1/4"RNF	712576	1

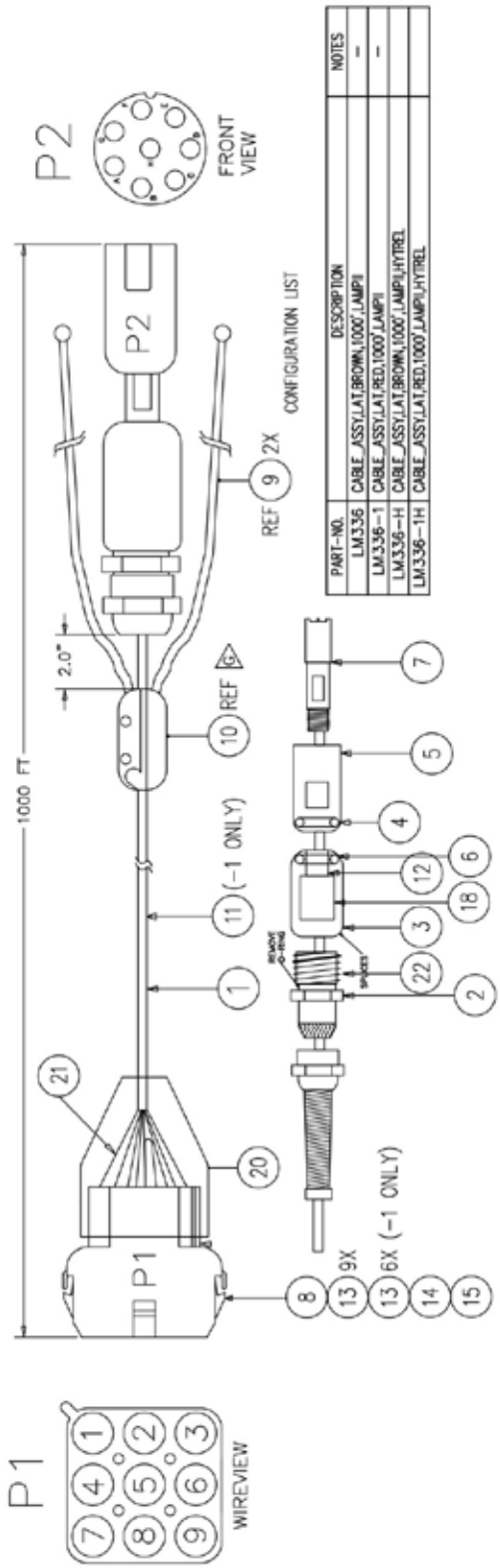
FIGURE 7. CABLE ASSY, PUSH, BLUE, HYT, 80', LAMP II, LM712



LAMPII BOM & EXPLODED VIEW DRAWINGS

CABLE ASSY,PUSH,BLUE, HYT, 80',LAMPII, (See Figure 7), LM712-H, Rev. G			
ITEM #	DESCRIPTION	P/N	QTY
0001	FITTING,CRIMP,PUSH CABLE,LAMPII	LM708	2
0003	CABLE,PUSH,BLUE,HYT,80',LAMP II	LM709-1H	1
0004	PCB ASSY,RECEPT,ALT PSH CBL,LAMPII	LM409	2
0005	CONN,HOUSING,DUAL,10P,1MM HIROSE	EC1843	2
0006	WIRES,CRIMMPED,PUSH CABLE,P&T	LM381	1
0007	CAP,PROTEC,PLAS,THREAD,PSH CBLE,LMP	HW601	1
0008	O-RING,2-016,BUNA-N	HW691	2
0009	TUBE,SHRINK,BLACK 1/8"	712789	1
0010	TUBE,SHRINK,BLACK 3/16"RNF	712577	1
0011	MRO-LUBRICANT,O-RING 2 OZ TUBE	439986	1
0012	MRO-EPOXY,3M DP-105 CLEAR,50ML	CS557	1
0013	MRO-EPOXY MIXER NOZZLE,1:1	CS558	1
0014	GREASE,ANTI SEIZE 8 LB	420797	1

FIGURE 8. CABLE ASSY,LAT,BRN,6CND,1000', LAMP II, LM336



LAMPII BOM & EXPLODED VIEW DRAWINGS

CABLE ASSY,LAT,BRN,6CND,1000',LMPII, (See Figure 8), LM336, Rev. K			
ITEM #	DESCRIPTION	P/N	QTY
0001	CABLE,6COND,1COAX,BRWN,1000',LAMPII	EC2189	1
0002	STRAIN RELIEF FITG,W/SPRNG 3/8NPT	HW2295	1
0003	REDUCER,SPLICE CHAMBER,3/8NPT,LMPII	LM273	1
0004	O-RING,2-016,BUNA-N	HW691	1
0005	NUT,CONNECTOR,PUSH CABLE,LAMPII	LM233	1
0006	O-RING,2-015,BUNA N	HW1093	1
0007	ADAPTER ASSY,LAT.CABLE,LAMP2	LM344	1
0008	CAP,9-PIN	712609	1
0012	MRO-PERMANENT LOCK,ND 140500-50,RED	440060	1
0013	PIN,BRASS,F/WIRE SIZE 18-24	EC1160	8
0014	WIRE,#22AWG,YELLOW,PVC,STRD	EC414	1
0015	WIRE,#22AWG,VIOLET,PVC,STRD	EC415	1
0016	TUBE,SHRINK,BLACK 1/8"	712789	1
0017	TUBE,SHRINK,BLACK 1/4"RNF	712576	1
0018	MYLAR,INSULATNG,.75"X3",SPLCE CHBR	LM293	1
0019	TUBE,SHRINK,BLACK 3/4"ADH	712579	1
0020	TUBE,SHRINK,BLACK 4:1 RATIO	715010	1
0021	TAPE,SPLICING,RUBBER,SLF VULCANZG	CS058	1
0022	MRO-TAPE,TEFLON,½" X 520"	CS171	1

FIGURE 9. INSTRUCTION SHEET, CABLE ASSY, LAT, 1000', LAMP II, LM925-INST

LAMPII BOM & EXPLODED VIEW DRAWINGS

FIGURE 10A. PUSH DRIVE ASSY, ALTERNATE,LAMP II, LM331

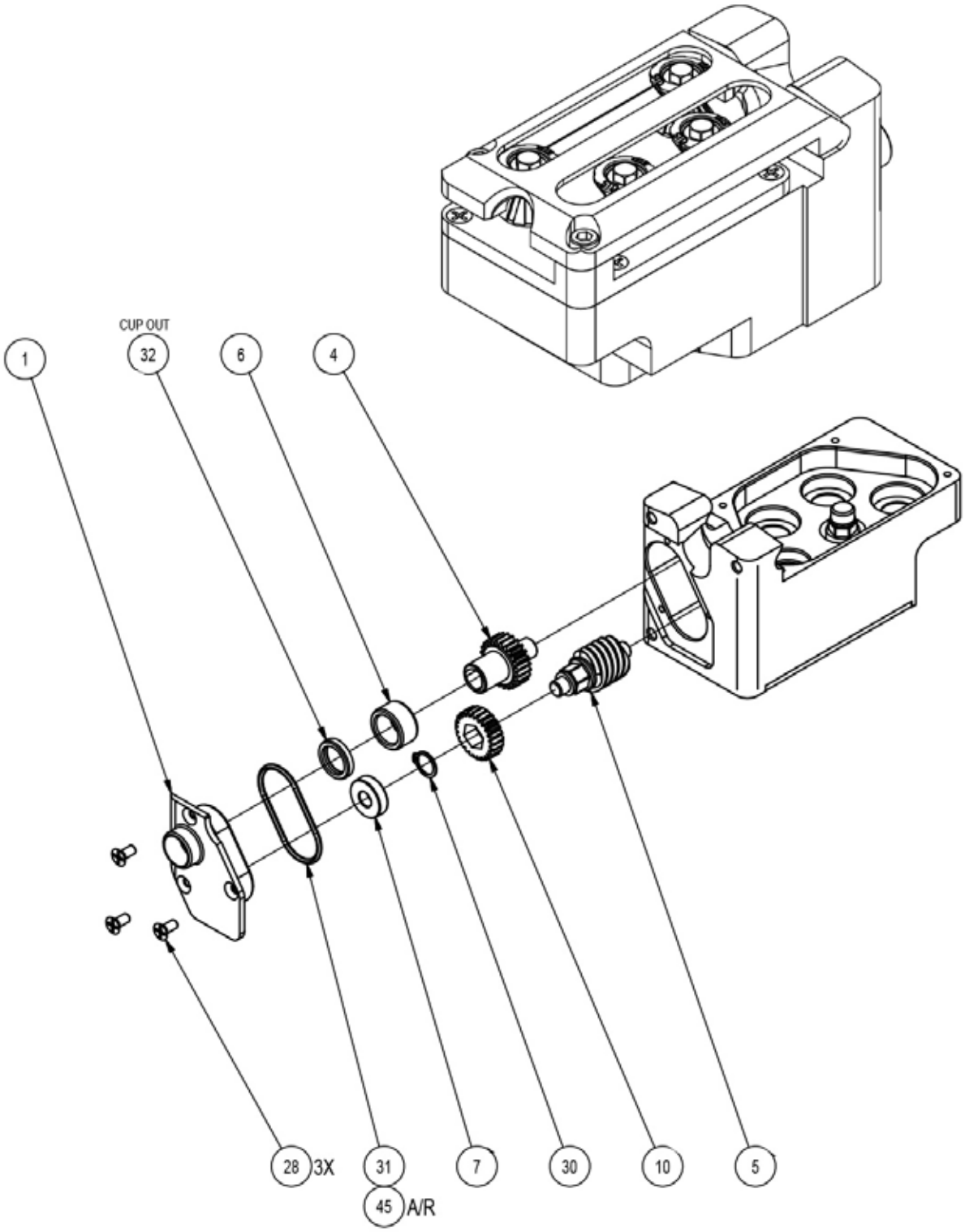
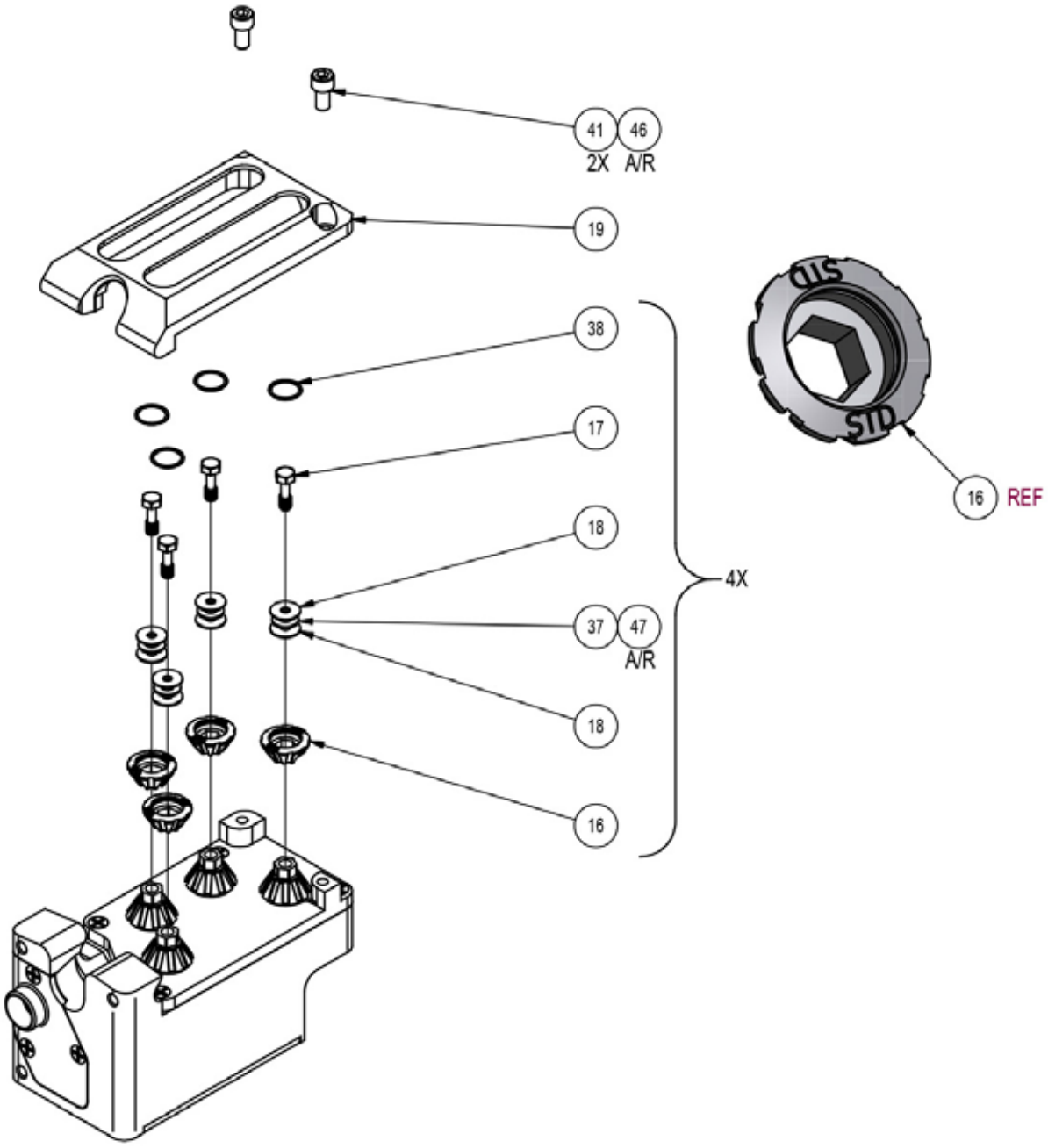


FIGURE 10B. PUSH DRIVE ASSY, ALTERNATE,LAMP II, LM331



LAMPII BOM & EXPLODED VIEW DRAWINGS

FIGURE 10C. PUSH DRIVE ASSY, ALTERNATE,LAMP II, LM331

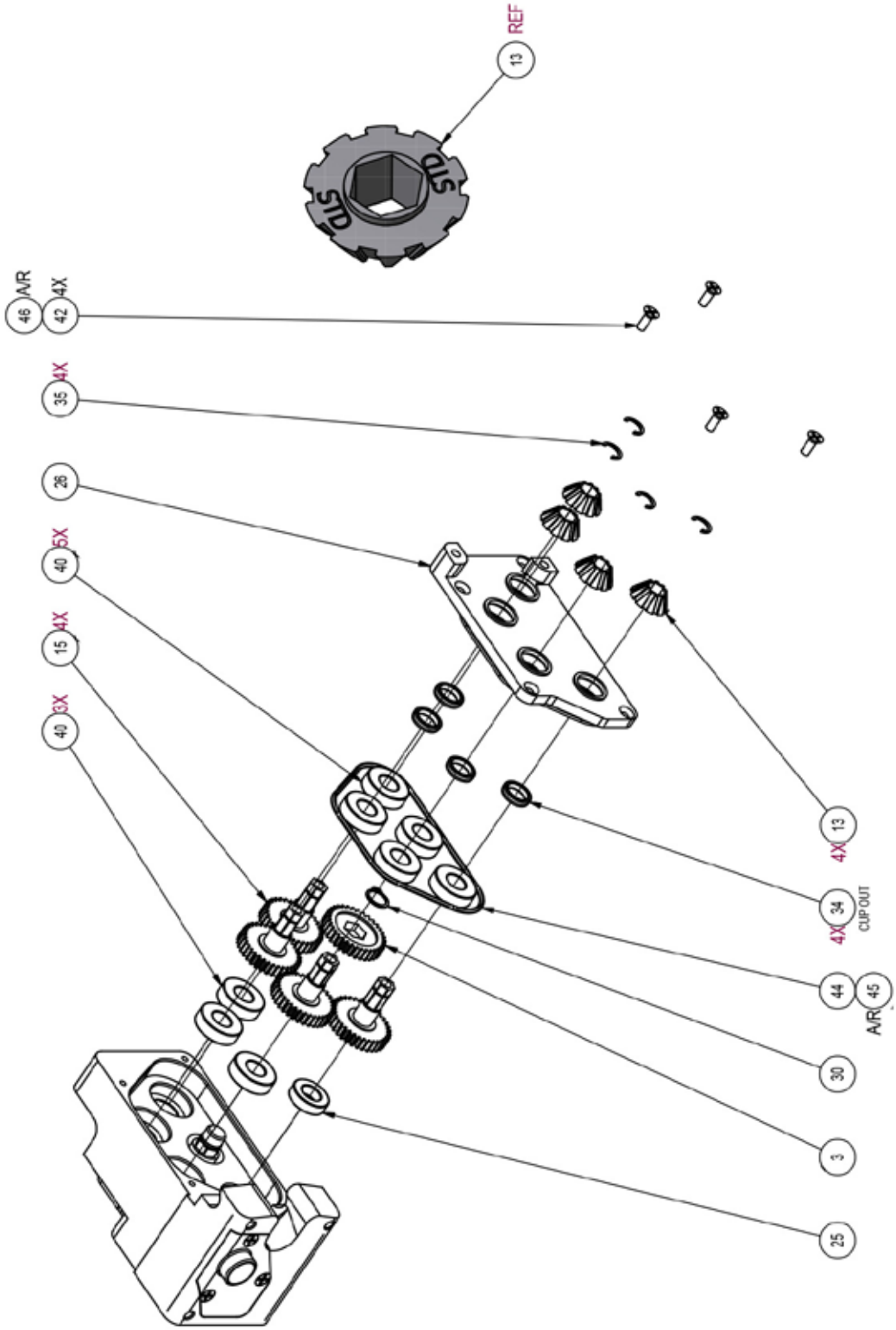
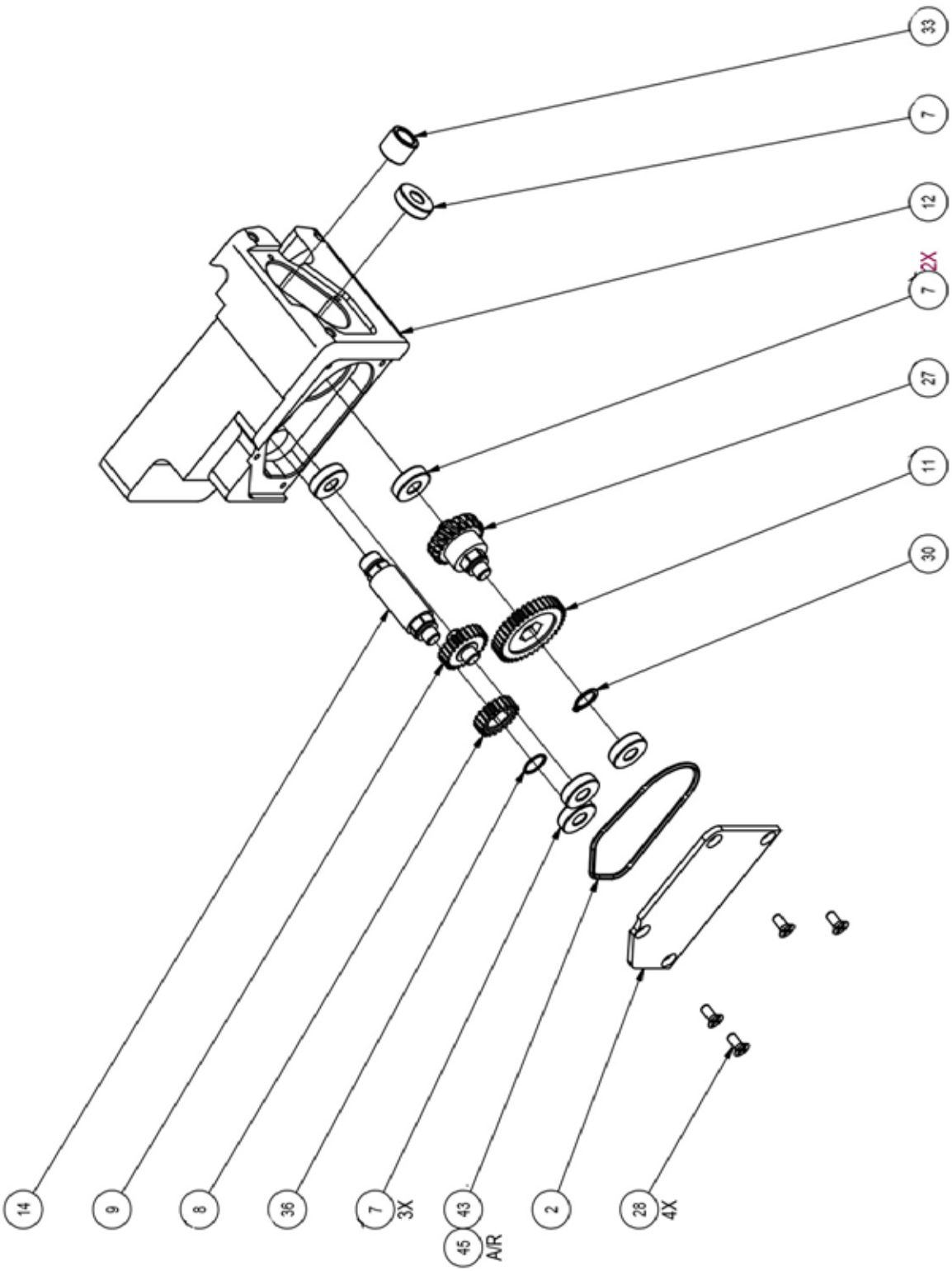


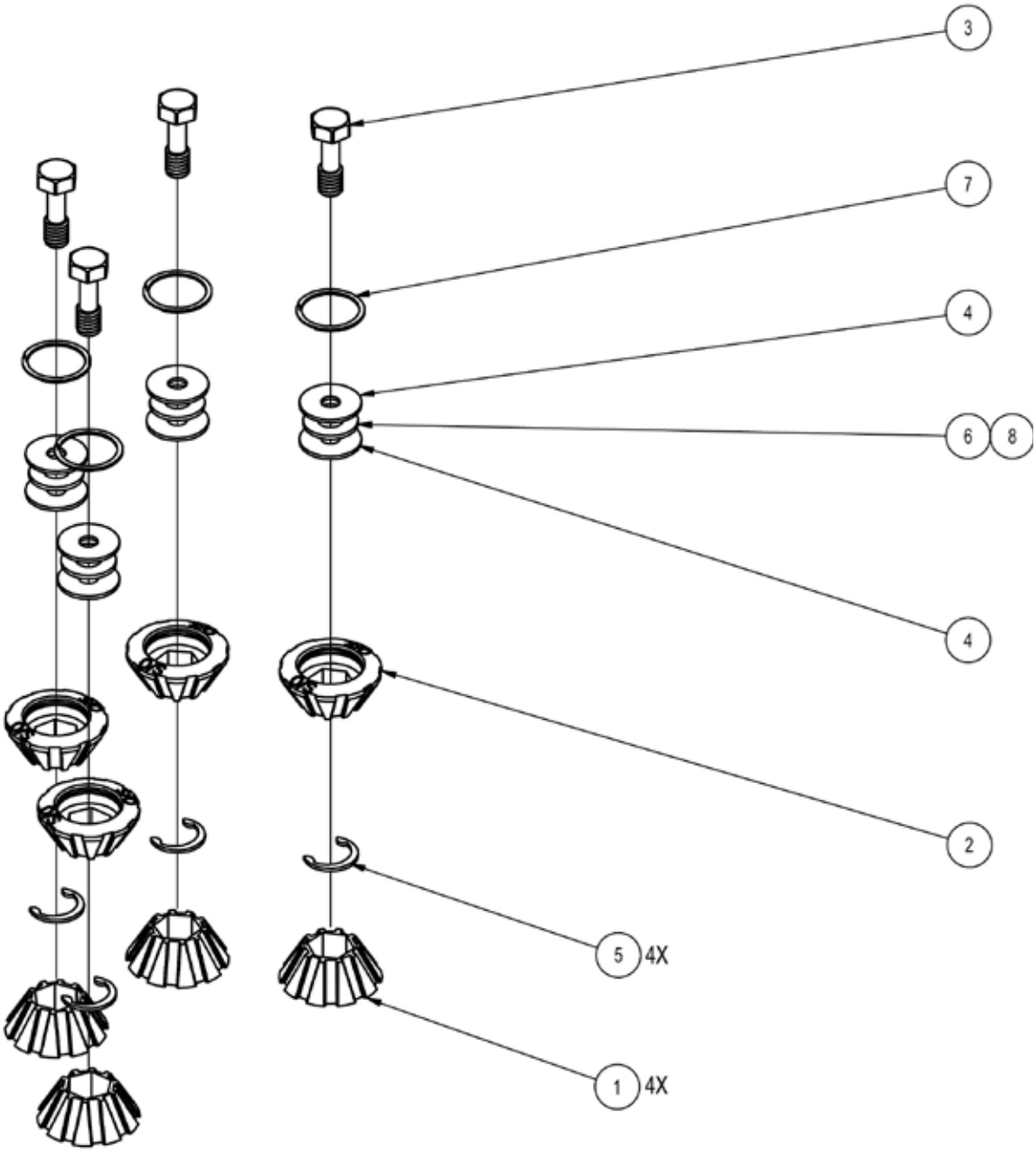
FIGURE 10D. PUSH DRIVE ASSY, ALTERNATE,LAMP II, LM331



LAMPII BOM & EXPLODED VIEW DRAWINGS

PUSH DRIVE ASSY,ALTERNATE,LAMP II, (See Figure 10), LM331, Rev. E			
ITEM #	DESCRIPTION	P/N	QTY
0001	COVER PLATE,FRONT,PUSH DRIVE	LM205	1
0002	COVER PLATE,BOTTOM,PUSH DRIVE	LM206	1
0003	GEAR,SPUR,32DP,34T,20PA,LONG SHAFT	LM208	1
0004	GEAR,PILT,SPUR,32DP,24T,20PA,PSH DR	LM210	1
0005	SHAFT,GEAR,QUAD,24DP,LH,PUSH DRIVE	LM211	1
0006	BEARING,12X17X9MM,OILITE,PUSH DRIVE	LM212	1
0007	BEARING,.250X.625X.196,OILIT,PSH DR	LM215	7
0008	GEAR,SPUR,32DP,24T,20PA,LONG SHFT	LM216	1
0009	GEAR SHAFT,IDLER,SPUR,32DP,24T,20PA	LM217	1
0010	GEAR,SPUR,32DP,24T,20PA,WRM SHFT	LM218	1
0011	GEAR,SPUR,32DP,39T,20PA WRM GR SHFT	LM219	1
0012	HOUSING,ALT PUSH CABLE ASSY	LM221	1
0013	ROLLER,BOTTOM,PUSH DRIVE	LM223	4
0014	SHAFT,DRIVE,LONG,PUSH DRIVE,LAMPII	LM224	1
0015	SHAFT,DRIVE IDLER,PUSH DRIVE	LM225	4
0016	ROLLER,TOP,PUSH DRIVE	LM226	4
0017	SCREW,CAPTIVE,HEX,8-32X.500,SS	LM227	4
0018	WASHER,CAPTIVE,.423OD,8-32,SS	LM228	8
0019	COVER,ROLLER,ALT PUSH ASSY,LAMPII	LM242	1
0025	BEARING,PLAIN,9X17X5MM	LM262	1
0026	COVER PLATE,TOP,PUSH DRIVE	LM272	1
0027	WORM GEAR&SHAFT ASSY,ALT PSH CBL	LM338	1
0028	SCREW,FLAT W/NYL INS,6-32X5/16 PHIL	HW153	7
0030	RETAIN RING,.350IDX.415ODX.023W,SST	HW1017	3
0031	O-RING,2-025 BUNA-N	HW1130	1
0032	SEAL,SHAFT,OIL,12MMX16MMX3MM	HW1519	1
0033	BEARING,NEEDLE,8MMX12MMX10MM LG	HW1945	1
0034	SEAL,OIL,9X13X3,NSO	HW2117	4
0035	RING,RETAINING,CRESANT,EXT,5/16,SST	HW2118	4
0036	RING,RETAINING,SPIRAL,EXT,.375,SS	HW2119	1
0037	WASHER,FLAT,#8,UHMW	HW2122	4
0038	RING,RETAINING,SPIRAL,INT 7/16",SST	HW2123	4
0040	BEARING,BALL,9MMX20MMX6MM,CER,SEAL	HW2284	8
0041	SCREW,CAP,SKT HD,10-32X3/8,SST	103030	2
0042	SCREW,FLAT,6-32X3/8 PHIL SST	103058	4
0043	O-RING,#2-033,1.989IDX.070W,BUNA	PM127	1
0044	O-RING, 2-039 BUNA-N, SHORE A 70	HW2918	1
0045	MRO-LUBRICANT,O-RING 2 OZ TUBE	439986	1
0046	MRO-REMOVABLE LCK,ND 121200-50,BLUE	440061	1
0047	MRO-GREASE,MOBIL 1 SYNTHETIC	CS419	1

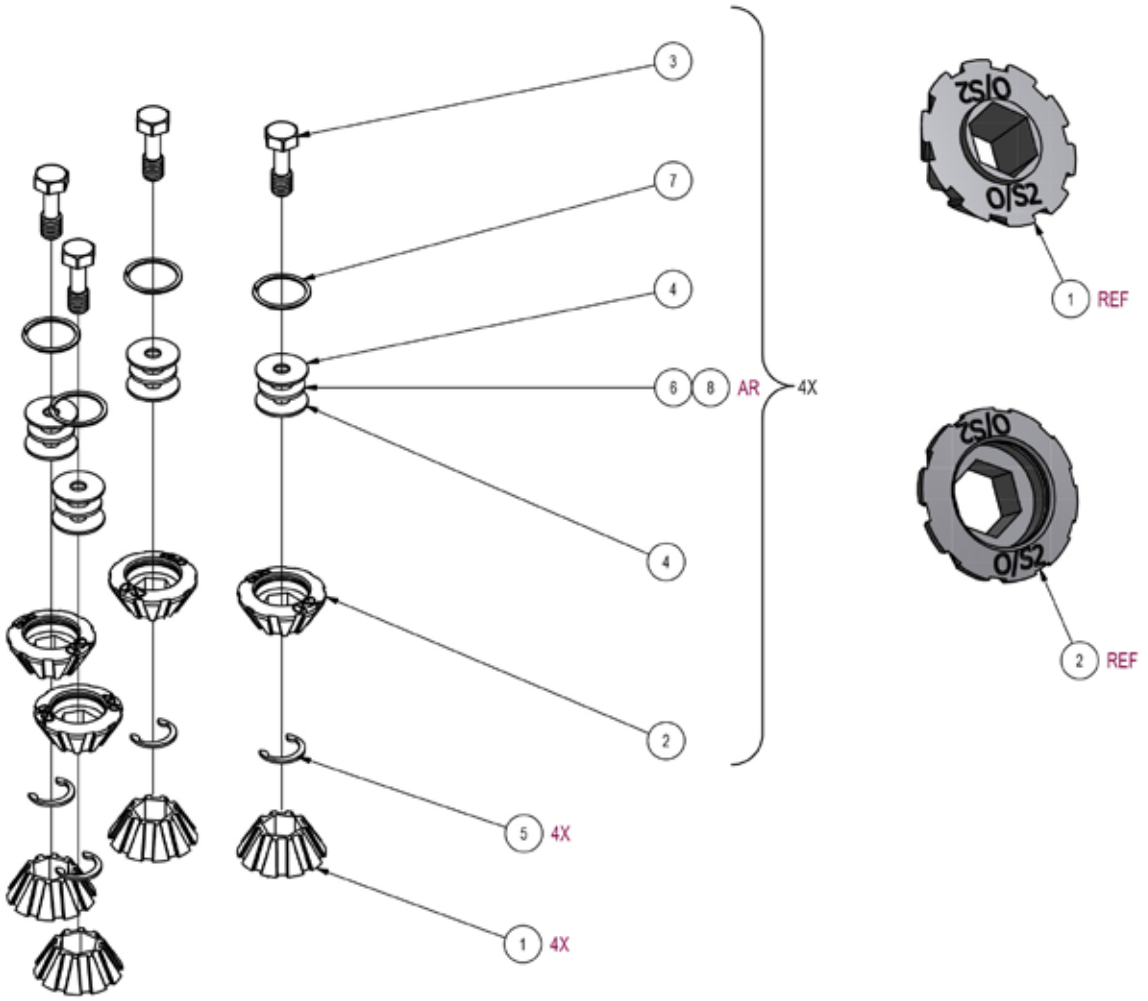
FIGURE 11. KIT,LRG PUSH WHEELS,,ALT,LAMP II, LM920



LAMPII BOM & EXPLODED VIEW DRAWINGS

KIT,LRG PUSH WHEELS,,ALT,LAMP II, (See Figure 11), LM920, Rev. B			
ITEM #	DESCRIPTION	P/N	QTY
0001	ROLLER,BOTTOM,PUSH DRIVE,LARGE	LM223-1	4
0002	ROLLER,TOP,PUSH DRIVE,LARGE	LM226-1	4
0003	SCREW,CAPTIVE,HEX,8-32X.500,SS	LM227	4
0004	WASHER,CAPTIVE,.423OD,8-32,SS	LM228	8
0005	RING,RETAINING,CRESANT,EXT,5/16,SST	HW2118	4
0006	WASHER,FLAT,#8,UHMW	HW2122	4
0007	RING,RETAINING,SPIRAL,INT 7/16",SST	HW2123	4
0008	MRO-GREASE,MOBIL 1 SYNTHETIC	CS419	1
0009	MRO-REMOVABLE LCK,ND 121200-2,BLUE	CS036	2
0010	INST SHT,PUSH WHEELS,ALT LAMP II	LM921-INST	1

FIGURE 12. KIT,X-LRG PUSH WHEELS,,ALT,LAMP II, LM926



LAMPII BOM & EXPLODED VIEW DRAWINGS

KIT,X-LRG PUSH WHEELS,,ALT,LAMP II, (See Figure 12), LM926, Rev. -			
ITEM #	DESCRIPTION	P/N	QTY
0001	ROLLER,BOTTOM,PSH DRV,XTRA LRG	LM223-2	4
0002	ROLLER,TOP,PSH DRV,XTRA LRG	LM226-2	4
0003	SCREW,CAPTIVE,HEX,8-32X.500,SS	LM227	4
0004	WASHER,CAPTIVE,.423OD,8-32,SS	LM228	8
0005	RING,RETAINING,CRESANT,EXT,5/16,SST	HW2118	4
0006	WASHER,FLAT,#8,UHMW	HW2122	4
0007	RING,RETAINING,SPIRAL,INT 7/16",SST	HW2123	4
0008	MRO-GREASE,MOBIL 1 SYNTHETIC	CS419	1
0009	MRO-REMOVABLE LCK,ND 121200-2,BLUE	CS036	2
0010	INST SHT,PUSH WHEELS,ALT LAMP II	LM921-INST	1

LARGE PIPE EQUIPMENT

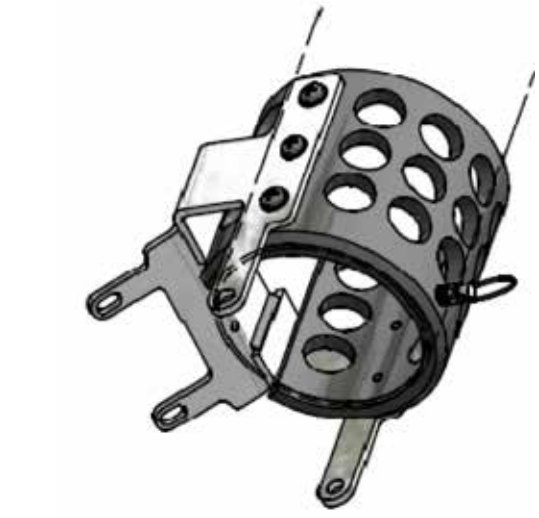
SYSTEM CONFIGURATION

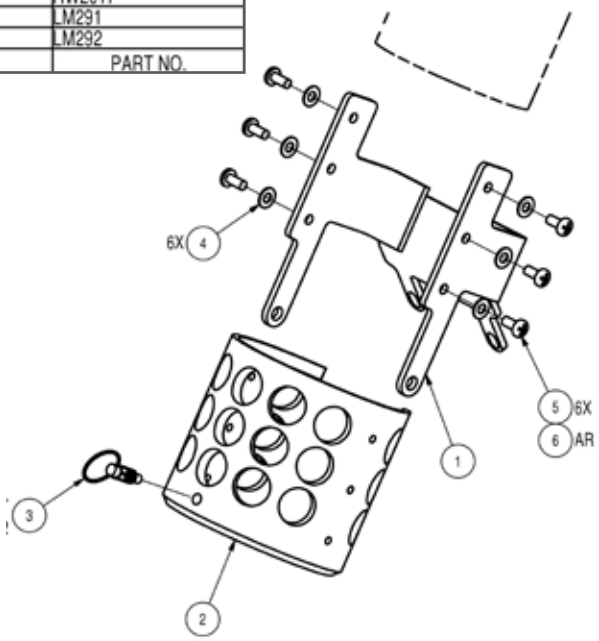
LM931, KIT, MODULAR, ANGLED CHUTE, 24" - 36"			
0001	CHUTE ASSY,MODULAR,ANGLED,14" WHEEL	LM363	1
0002	TUBE,POLYCARB,MOD CHUTE,18"L	LM297-1	1
0003	TUBE,POLYCARB,MOD CHUTE,14"L	LM297-2	1
0004	TUBE,POLYCARB,MOD CHUTE,10"L	LM297-3	1
0005	KIT,ADAPTER,14" PNEU WHEELS,LAMP II	LM935	1
0006	INST SHEET,MOD,WHL/ANG CHUTE,24-36"	LM931-INST	1

LM932, KIT, MODULAR, STRAIGHT CHUTE, 24" - 36"			
0001	CHUTE ASSY,STRAIGHT,LRG PIPE	LM362	1
0002	TUBE,POLYCARB,MOD CHUTE,18"L	LM297-1	1
0003	TUBE,POLYCARB,MOD CHUTE,14"L	LM297-2	1
0004	TUBE,POLYCARB,MOD CHUTE,10"L	LM297-3	1

LM362, STRAIGHT CHUTE

ITEM	QTY	DESCRIPTION	PART NO.
6	1	MRO-REMOVABLE LCK,ND 121200-2,BLUE	CS036
5	6	SCREW, PAN, PHIL, 8-32 x 3/8, SST	103065
4	6	WASHER, FLAT, NO. 8, .180 X .375 X .023, 18-8, SST	100139
3	1	SPRING PLUNGER, WITH PULL RING, .250-20, SST.	HW2017
2	1	BREECH, TUBE, MODULAR CHUTE	LM291
1	1	HOLDER, WELD, MODULAR CHUTE	LM292



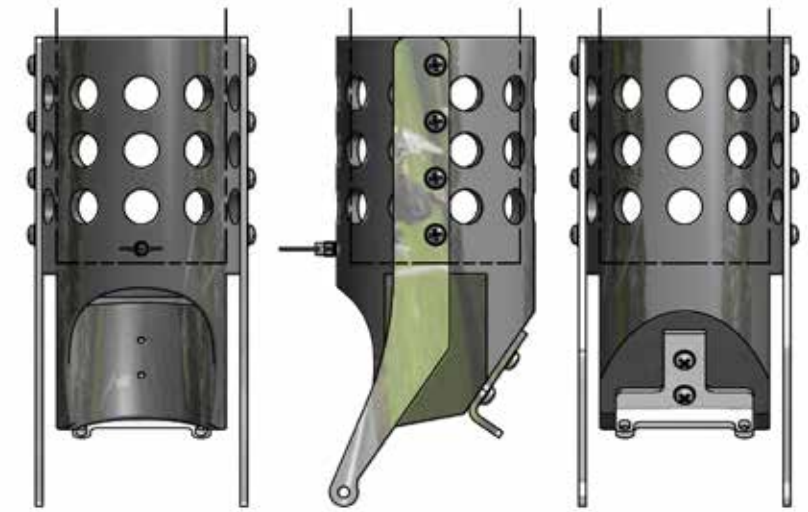


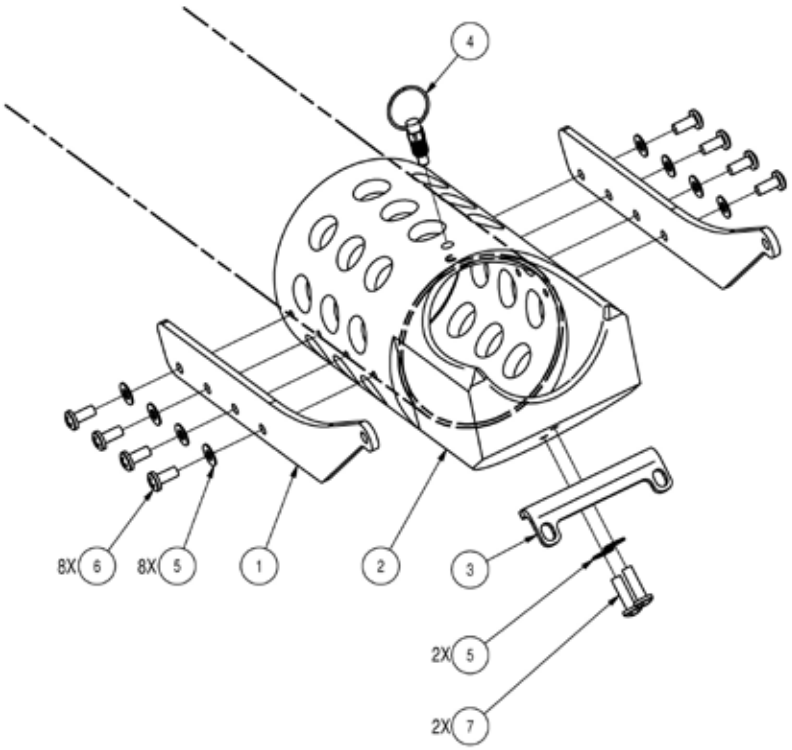
LAMPII BOM & EXPLODED VIEW DRAWINGS

LARGE PIPE EQUIPMENT

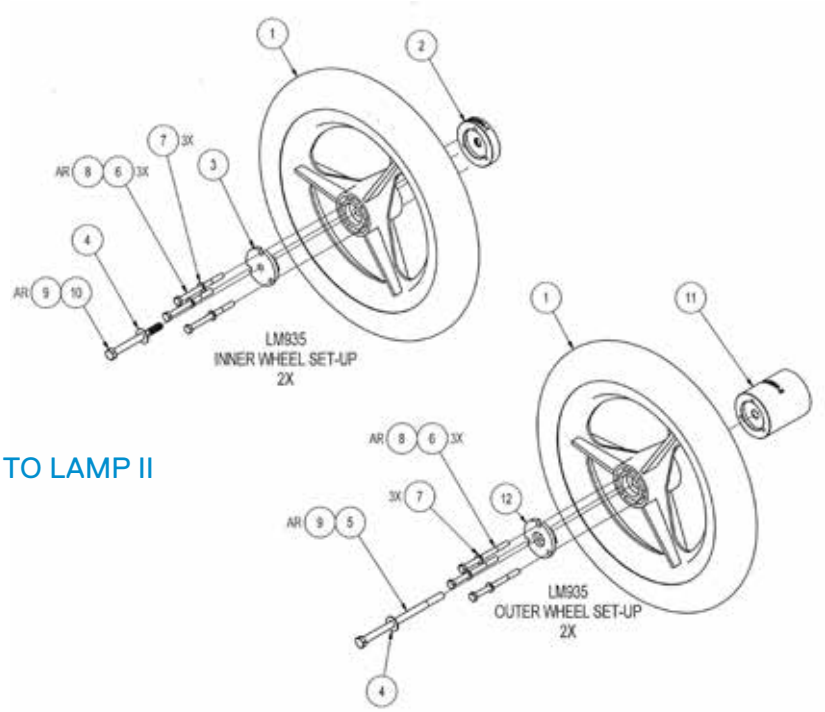
LM363, ANGLED CHUTE

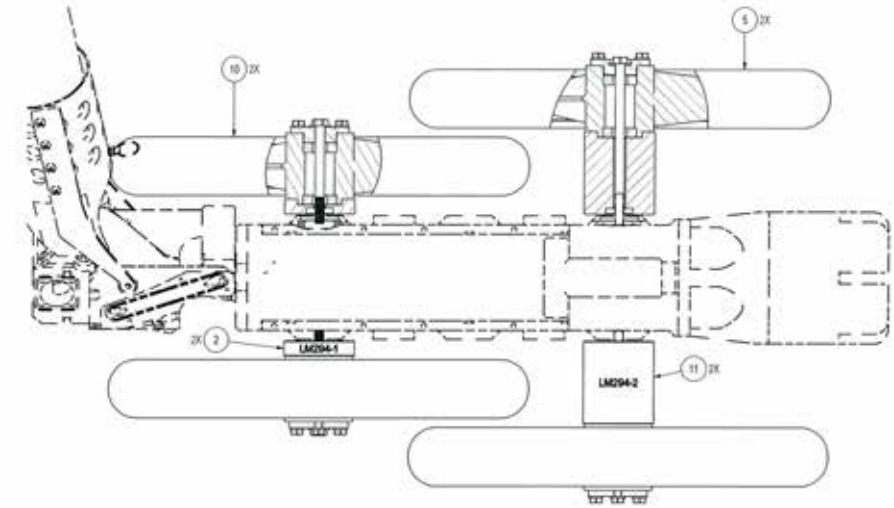
ITEM	QTY	DESCRIPTION	PART NO.
7	2	SCREW, PAN, PHIL, 8-32 X 0.562, 18-8, SST	HW004
6	8	SCREW, PAN, PHIL, 8-32 x 3/8, SST	103065
5	10	WASHER, SPLIT LOCK, #8, .174 X .294 X .040, 188-8, SST	101738
4	1	SPRING PLUNGER, WITH PULL RING, .250-20, SST.	HW2017
3	1	FRONT BRACE, BIG WHEEL ANGLED CHUTE	LM286
2	1	BREECH, BIG WHEEL ANGLED CHUTE	LM285
1	2	SIDE BRACE, BIG WHEEL ANGLED CHUTE	LM287





LM935, K2 WHEELS TO LAMP II ADAPTER KIT





KIT,ADAPTER,14" PNEU WHEELS,LAMP II, LM935			
0001	WHEEL ASSY,PNEUMATIC,14"	MD046	4
0002	SPACER,ADPTR,2.63",K2 WHEELS-LMII	LM294-2	2
0003	PLATE,RTNG,K2 WHEELS,FRNT-LMII	LM295-1	2
0004	WASHER,FLAT,5/16 SST	101741	4
0005	SCREW,HEX,5/16-24,MODOD	HW2475	2
0006	SCREW,HEX,M6X75MM,ZN PL	HW2407	12
0007	WASHER,FLAT,M6XØ12X1.5MM SST	HW1738	12
0008	MRO-REMOVABLE LCK,ND 121200-50,BLUE	440061	4
0009	ANTI-SEIZE,BRSH,NICKL GRAF,2 OZ	CS488	1
0010	SCREW,HEX,5/16-24X3 1/4,ZN PL	HW2405	2
0011	SPACER,ADPTR,.50",K2 WHEELS-LMII	LM294-1	2
0012	PLATE,RTNG,K2 WHEELS,REAR-LMII	LM295-2	2

CUES STANDARD 12 MONTH WARRANTY

CUES ("CUES") warrants that all parts, components, and equipment manufactured by CUES shall be free from defects in material and workmanship under normal use and service for which it was intended for a period of twelve (12) months from the date of shipment of materials by CUES to the purchaser. CUES' obligation under this warranty is limited, at CUES' option, to replacing or repairing, free of charge, any defective materials returned, freight prepaid, to the CUES designated service facility. For all warranty claims, the materials must be returned in accordance with CUES Material Return Policy.

Major items of equipment, such as vehicles, generators, etc., furnished, but not manufactured by CUES, will be covered only under the warranty of the third party manufacturer of such equipment. Expendable parts, such as light bulbs, fuses, connectors, etc., are excluded from this warranty.

Purchaser must notify CUES of a breach of warranty not later than the last day of the warranty period; otherwise, such claims shall be deemed waived.

CUES does not warrant the materials to meet the requirements of the safety codes of any federal, state, municipal or other governmental or administrative jurisdiction. Purchaser assumes all risk and liability whatsoever resulting from the use of its products, whether used singly or in combination with other products, machines or equipment.

This Warranty shall not apply to any materials, or parts thereof, which have; (a) been repaired or altered by anyone other than CUES without CUES' written consent; (b) been subject to misuse, abuse, negligence, accident, or damage; (c) not been installed or operated in accordance with CUES' printed instructions, or; (d) been operated under conditions exceeding or more severe than those set forth in the specifications of design tolerance of the equipment.

THIS WARRANTY AND THE OBLIGATION AND LIABILITIES OF CUES HEREUNDER ARE EXCLUSIVE AND IN LIEU OF (AND PURCHASER HEREBY WAIVES) ALL OTHER WARRANTIES, GUARANTEES, REPRESENTATIONS, OBLIGATIONS, OR LIABILITIES, EXPRESSED OR IMPLIED, ARISING BY LAW OR OTHERWISE, INCLUDING ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, REGARDLESS WHETHER OR NOT OCCASIONED BY CUES' NEGLIGENCE.

CUES SHALL NOT BE LIABLE FOR ANY LOSS OR DAMAGE RESULTING, DIRECTLY OR INDIRECTLY, FROM THE USE OR LOSS OF USE OF THE MATERIALS, OR FOR SPECIAL, INDIRECT, OR CONSEQUENTIAL DAMAGES, ECONOMIC LOSSES, LOSS OF PROFITS, LOSS OF BUSINESS, OR LOSS OF BUSINESS OPPORTUNITY. Without limiting the generality of the foregoing, this exclusion from liability embraces Purchaser's expenses for downtime or for making up downtime, damages to property, and injury to or death of any persons.

CUES neither assumes nor authorizes any person (including employees, agents, or representatives of CUES) to assume for it any other liability, guarantee, or warranty in connection with the sale or use of the materials, and no oral agreements, warranties, or understandings exist collateral to or affecting this warranty.

This warranty shall not be extended, altered, modified, or waived except by a written instrument signed by CUES.

SAFETY PRECAUTIONS

Precautions must always be taken when operating electronic equipment. Exposed wires, damaged equipment, or improper operation can lead to a dangerous situation.

Please take a few minutes and read this entire manual prior to operating the equipment. Follow all safety procedures and thoroughly inspect equipment prior to use each day. This will help the equipment retain it's full value and will reduce the risk of injury, property, and/or equipment damage.



- Read the entire manual before attempting to connect or operate any equipment.
- Connect and disconnect cables only when the electric power is turned OFF.
- Never remove protection covers from the equipment or power generator. Internal repairs should only be done by an authorized CUES technician.
- If using a portable generator, always place it in an open area away from other equipment, manholes or obstructions prior to start-up; do not use a portable generator in an enclosed area.
- Upon receipt of the equipment, check for visible damage. If there is any evidence of rough handling, if damage is found, or if any equipment is missing, please contact the CUES Customer Service at 1-800-327-7791.

PERSONAL SAFETY EQUIPMENT & TRAINING

CUES stresses the use of appropriate safety equipment while working in and around manholes and during system operation. Safety should constantly remain the utmost priority. NOTE: The user of CUES products is responsible for all training and operation under federal, state and local guidelines and regulations for both confined space entry and traffic control. Recommended safety equipment includes but is not limited to the following:

- Safety goggles
- Work gloves
- Steel-toed boots
- Reflective vests
- Hard hats
- Filter masks (full respirators may be necessary)
- Flashlights
- Safety lines
- Traffic warning signs
- Traffic cones
- Gas detectors
- Ventilation fans

CUES ® makes no warranty for the use of its products and assumes no responsibility for any errors or omissions in this document or for incidental or consequential damages resulting from misuse of the products.

CUES MATERIAL RETURN POLICY

To ensure the orderly return of CUES products from our customers and to assure proper credit and warranty replacements handled in a timely manner, CUES has implemented a MATERIAL RETURN AUTHORIZATION (MRA) SYSTEM. Please read and follow the instructions below to ensure your MRA is handled properly and efficiently:

1. Once it is determined that a CUES product needs to be returned, call the CUES Parts Department in Orlando at 1-800-327-7791.
2. CUES will provide an MRA number by phone and ask a few questions.
3. CUES will then mail or fax the MATERIAL RETURN AUTHORIZATION (MRA) FORM with the MRA number, or include it with the replacement parts, if applicable.
4. Follow all instructions on the MRA Form. Make 2 copies - one for your records and the other will be used as a packing list.
5. Place an MRA sheet in with the parts that are shipped back to CUES along with a copy of the original packing slip or invoice, if possible. Send only the parts originally agreed upon with your Parts Representative. Any deviations/changes will require an additional MRA.
6. Make sure to include a copy of the MRA form for a packing slip.
7. Write the MRA number on the outside of the box.
8. Please take care in packing the parts that are to be shipped back to CUES. Parts must be individually protected from each other and appropriate packing material must be used to prevent damage during shipping.
9. Freight on the material returned is to be prepaid by the customer. Depending on the warranty determination, CUES, at its' option, may credit freight charges both ways.
10. The parts must be returned to CUES within 5 days of receipt of the MRA for credit to be granted.

Under normal circumstances, a warranty determination can be made within 30 days, and if under warranty, the part will be replaced at no charge. A credit will be issued if you have already received a replacement part. No credits will be issued until CUES receives the defective part.

*******NOTE*******

CUES will not warrant look-alike parts sold by competitors and reserves the right to charge a restocking fee. CUES shall not be liable for any loss or damage resulting, directly or indirectly, from the use of the materials, or for special, indirect, or consequential damages, economic losses, loss of profits, loss of business, or loss of business opportunity.

Without limiting the generality of the foregoing, this exclusion from liability embraces purchaser's expenses for downtime or for making up downtime, damages to property, and injury to or death of any persons.

CUES neither assumes nor authorizes any person (including employees, agents, or representatives of CUES) to assume for it any other liability, guarantee, or warranty in connection with the sale or use of the materials, and no oral agreements, warranties, or understandings exist collateral to or affecting this warranty. This warranty shall not be extended, altered, modified, or waived except by a written instrument signed by an authorized CUES representative.

CUES MATERIAL RETURN AUTHORIZATION

Cust #:	Name:	Contact:	Date: 4/21/2004

Original SO #: N/A	SO Orig:	Dated:	New SO #:	S.O. To Be Credited:

Return For:	Reason:	Territory	Prod. Ref. Cd: 51200	Orig:

Explanation:

	Items Returned
1	
2	
3	
4	
5	
6	

To ensure your MRA is handled properly and efficiently, please follow the instructions below.

1. Ship parts back within five (5) business days of receiving your MRA number. Parts ordered in error are subject to a restocking fee.
2. Send only the parts originally agreed upon with your customer service representative. Any deviations will require an additional MRA.
3. Make a copy of this sheet and keep the original for your records. Use the copy as a packing slip.
4. Write the MRA number on the outside of the box.
5. Parts must be individually protected from each other (original packaging would be best) and appropriate packing material must be used to prevent against damage during shipping.
Note: If parts are not well protected and arrive at our facility damaged in any manner, we will automatically reject them and return them to you without credit.

PARTS WILL BE RETURNED TO CUSTOMER AT CUSTOMER EXPENSE WITHOUT AN MRA NUMBER DOCUMENTED ON BOX. CUES IS NOT RESPONSIBLE FOR SHIPMENT FROM CUSTOMER TO CUES.

Use this section as a Packing Slip.

Please remember to write the MRA number on the box.

MRA #:
XXXX

Return To:

Cues
3600 Rio Vista Avenue
Orlando, Fl. 32805
(407) 849-0190
FAX (407) 425-1569
WATS 800-327-7791

CUES PARTS & SERVICE

At CUES, we realize your return on investment is directly related to daily production in the field. By stocking the largest inventory of OEM equipment in our industry, CUES strives to ship all parts orders on the same day or within 24 hours after receipt of the order.

Whether you need a camera or a fuse, CUES will quickly process and ship your order in accordance with your schedule requirements! Our experienced parts professionals can help you with parts identification, shipping methods, equipment operation questions, and connect you to the correct specialist for troubleshooting!

CUES offers four convenient stocking locations that contain a large assortment of parts, finished products, portable, and truck mounted systems. Texas, Arizona, Oklahoma and Louisiana customers can be serviced by our local dealerships. Contact us at your most convenient stocking location! For authorized dealer locations, log onto our website at
www.cuesinc.com.

Parts can be ordered via phone or facsimile! For operating hours, contact information, and locations, log onto our website at www.cuesinc.com. Contact us at your most convenient stocking location! Log onto our website at www.cuesinc.com to view the CUES Parts Department & Dealers hours & locations.

CUES Parts Department: Parts turnaround is normally within 24 hours after receipt of order. Please note that special shipping arrangements can be made at the time of the order. All return shipments received at CUES freight collect will be refused upon delivery unless previously authorized by CUES personnel. Normal operating hours are 8am to 5pm, EST., Phone: 800-327-7791, Fax: 800-831-1184.

CUES Service Depot: Service turnaround is normally 72 hours or less upon receipt at our depot, excluding weekends and holidays. All return shipments received at CUES freight collect will be refused upon delivery unless previously authorized by CUES personnel. Normal operating hours are 8am to 5pm, EST., Phone: 800-327-7791.

West Coast

For West Coast Customers:
The parts and service depot is located at 1943 S. Augusta Court, Ontario, CA, 91761. Normal operating hours are 8am to 5pm, PST
Phone: 800-544-8695

Canada

For Canadian Customers:
The parts and service depot is located at 1675 Sismet Road, Unit 2 & 3, Mississauga, Ontario L4W1P9
Phone: 905-238-9178

Midwest

CUES Midwest:
www.cuesmidwest.com
2325 Parklawn Drive, Suite K
Waukesha, WI 53186
Phone: 262-717-3165
Fax: 262-717-3167

CUES RECORD OF REVISIONS

This Record of Revision page is designed to allow the manual user to determine the engineering/ manufacturing level to which the manual is written. As engineering changes to this hardware are made at CUES, necessary information in the manual will be revised to reflect those changes. The latest change level and the rationale for any change(s) will be explained in tabular format on this page to allow the manual user to be better equipped should the need arise to call CUES regarding technical information.

Original Manual	Revision	Change Description
LAMPII	042909	Initial preliminary release
	1-070110	Added the new fiberglass push cable assembly & various other updates
	2-060711	Added BOM & Exploded View Drawings
	3-070611	Revised fiberglass push cable drive instructions on page 13.
	4-090711	Added new rear-viewing camera instructions
	5-071512	Wheel Matrix updated; various other procedural modifcations updated to current.
	6-101112	Added instructions on how to install the LAMPII immobilizing block.
	7-092514	Various updates required to add Mini Pan & Tilt instructions (added Bump Stops, Immobilizing block, etc.
	8-111214	Line Tracing Cable Extension with LAMPII instructions added.
	9-010915	Added the new Remote RETRIEVE/RELEASE Reel Controller instructions and pictures.
	10-060115	Added the revised Wheel Configuration Matrix, which now includes the new 8" steel wheel kit. Updated all BOM & Exploded View Drawings. Updated entire manual to current procedures and equipment configuration information.
	11-121015	Various updates required throughout the user manual per the email from Pearce Stanek-Johnson dated 11/24/15.
	12-051017	Various updates throughout the manual to distinguish between different cable types
	13-081117	Wheel Matrix updated to Rev. A
	14-121517	Added the LAMP II Push Wheel Replacement Guide
	15-100118	Various updates required per ECN #121633
	16-052620	Updated per # ECN 14322_LM907-INST; Updated the LAMP II KEYS FOR SCREENS FUNCTIONS on page 44 to current.
	17-062320	Updated WHEEL MATRIX per ECR #122327
`	18-120220	Updated WHEEL MATRIX per ECN # 122496
	19-10.2026	Removed the Rear-View Camera Installation instructions; refer to Addendum P/N CMA00013-MAN for updated rear-view camera instructions.

Innovation for over 50 Years

CUES is the world's leading manufacturer of closed circuit television video (CCTV) inspection, rehabilitation, pipe profiling equipment and asset inspection/decision support software. For over 50 years, CUES has provided innovative pipeline inspection technology and solutions to enable accurate condition assessment and proactive maintenance programs for buried infrastructure.

In addition to inspection equipment, CUES also designs, manufactures, and sells a broad range of pipeline rehabilitation and profiling equipment. These include chemical grouting systems for sewer line pipe joints capable of using a wide variety of grouting products. CUES also manufactures lateral reinstatement cutting systems which enable the reinstating of laterals in mainline sewers after they have been relined with any of a wide variety of liner materials. Pipe profiling is accomplished via Laser for Sonar based systems.

CUES has the most locations and dealers available to serve you! To find a local CUES facility, find the operating hours for a particular location, or to contact us at your most convenient stocking location, please log onto our website at www.cuesinc.com or call the CUES Corporate Headquarters in Orlando, Florida for more information.