Topcon Laser Systems, Inc.

SMOOTHTRAC™
Sonic Averaging System (SAS)

Cedarapids
A Terex Company

22506 (11/00)

Cedarapids
A Terex Company

SMOOTHTRAC™
Sonic Averaging System (SAS)

SMOOTHTRAC™
Sonic Averaging System (SAS)

SmoothTrac™ incorporates proven Sonic Tracker® technology with special software to completely eliminate the need for contact type skis on road machines.

SmoothTrac™ can be adapted to all brands of pavers and profilers and can be made compatible with existing Topcon System IV Paver Systems components with a simple software upgrade.

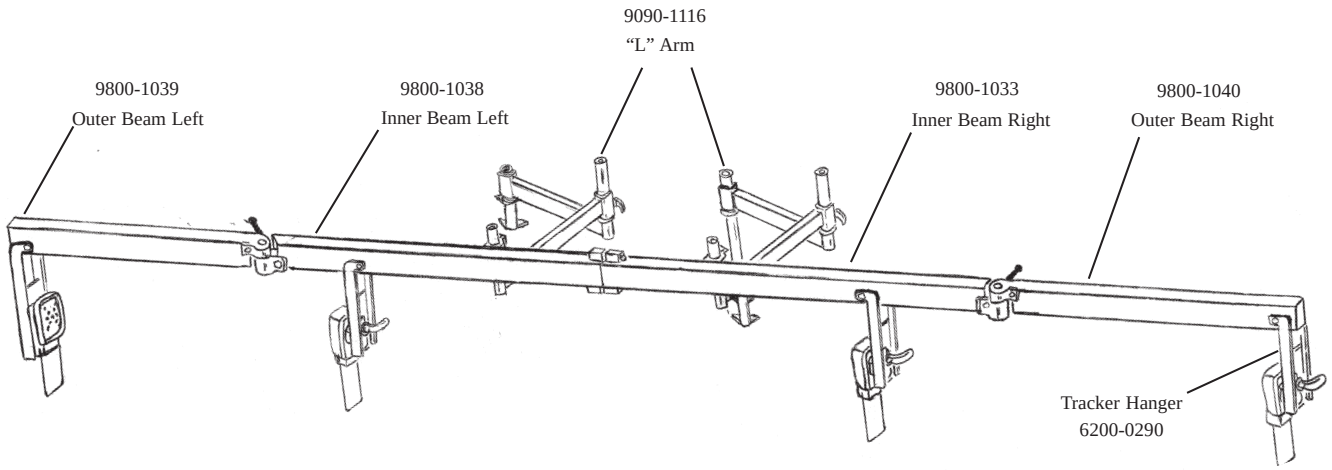
The non-contact design allows full maneuverability of paver and profilers, and turn around or back up without removing or lifting the beam. With the single knob mat thickness control in hundredths of a foot from the screed platform, this allows the operator greater control of material.

Quick and easy setup and storage on the paver eliminates the loss or damage to the ski during transport or changing to joint matching.

The beam can be setup to "over the screed" reference without adding large and awkward sections to the beam.

NOTE: When adding SmoothTrac™ to an existing paver control system, be sure the existing system is upgraded with SAS software on both the control boxes and the trackers being used. (See Control Box Setup Rev Info on page 13)

Beam Layout



Cedarapids
A Terex Company

SMOOTHTRAC™
Sonic Averaging System (SAS)

Safety Precautions

1. Read and become familiar with the manufacturer's operations manual, including safety information before installing or using Topcon System Four.

2. Working around heavy construction equipment can be dangerous. Always use extreme caution on the job site.

Warning - Do not stand or sit on machine parts meant for operation.

3. The mandrel should be grounded before working on or around the paver.

4. Do not attach System Four components to the paver while the engine is running.

5. Do not allow any System Four component to limit the visibility of the operator in an unsafe manner.

6. Use tie-wraps supplied with System Four to keep hoses and wires secured and away from wear or pinch joints.

7. Use eye protection when welding, cutting, or grinding is being done on the machine.

8. Hydraulic lines can be under extreme pressure even when the machine is turned off. When working on or near hydraulic lines, protect yourself at all times and wear protective clothing.

Warning - Relieve all pressure in the hydraulic lines before disconnecting or removing any lines, fittings, or related components. If injury does occur, seek medical assistance immediately. Consult the profiler OEM Operator's Manual for details.

9. When using laser control, avoid direct exposure to your eyes.

Caution - Do not stare into the laser beam or view the beam directly with optical equipment.

10. When welding, always use appropriate welding precautions and practices. Use shielding to prevent onlookers from staring into the light.

11. After welding, all affected areas should be painted with a rust inhibitor.

Notice - Disconnect all Topcon system electrical cables prior to welding on the machine.

Warning - Do not weld near hydraulic lines or on any equipment when in operation.

Notice - All mounting bracket welds must be secure and strong to prevent the sensor equipment from vibrating excessively or from becoming detached at the weld during operation.

Notice - Keep the carrying case dry at all times. Do not allow moisture to get inside the case. Moisture trapped in the case can adversely affect components. If moisure does enter the carrying case, leave it open and allow it to dry thoroughtly before storing any components.

12. To prevent vandalism or theft, do not leave the removable Topcon components on the machine during off hours. Remove the components after work and store in carrying case.

Cedarapids
A Terex Company

SMOOTHTRAC™
Sonic Averaging System (SAS)

Installation

1. During installation, in order to accurately align the beam assembly onto the pivot post, use the center portion of the beam or equivalent weld fixture.

2. Both attachment posts must be mounted (welded) perpendicular to upper surface of the tow arm, and parallel to each other.

3. Prior to installation of the L arms, align locking collar on the end gate post with the stop collar on the tow arm pivot post.

4. Orientation of the L arms are dependent upon the height alignment of both collars. The L arms can be installed with 16” post in either the upright or downward pointing direction in order to raise or lower the beam and place the tracker within the required sensing range.

5. Loosely coil the cable about the beam sections and use the cable clamps to prevent sagging loops that might create a safety hazard.

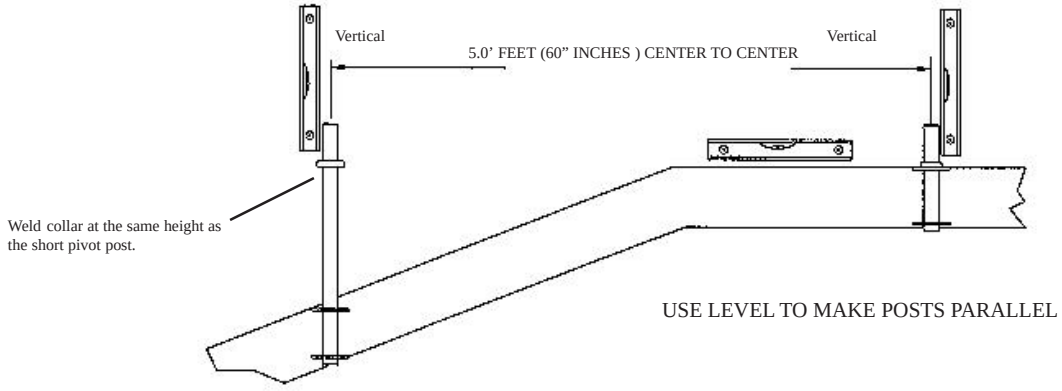
6. After initial installation, assure a good path to ground by partially tightening handles and lock bolts, and then moving all folding joints in and out. This should remove all paint which could prevent good grounding.

NOTE: A BAD GROUND WILL CAUSE UNSTABLE LIGHTS ON TRACKERS.

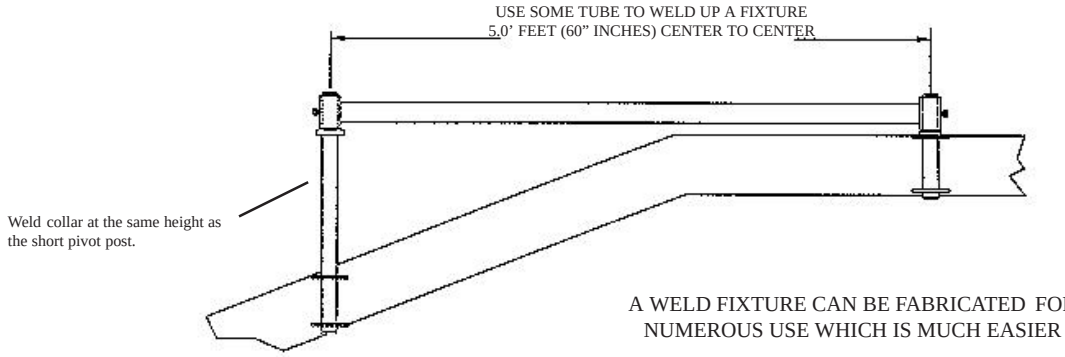
Cedarapids
A Terex Company

SMOOTHTRAC™
Sonic Averaging System (SAS)

Tow Arm Mount

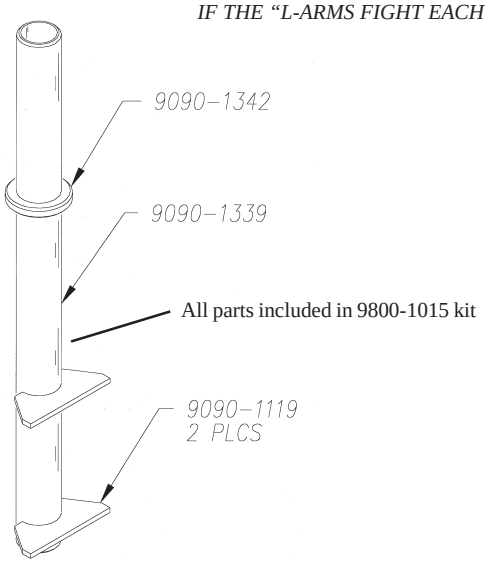


USE LEVEL TO MAKE POSTS PARALLEL



A WELD FIXTURE CAN BE FABRICATED FOR NUMEROUS USE WHICH IS MUCH EASIER

THE WELDING OF THE TWO PIVOT POSTS ARE 5 FEET (60") APART BECAUSE THE PIVOT BLOCKS ON THE BEAM ARE AT 5 FEET APART. WITH THE "L-ARMS" THIS CREATES A PARALLELOGRAM. THUS ALLOWING THE BEAM TO BE EXTENDED OR RETRACTED AWAY FROM THE MACHINE SMOOTHLY AND EVENLY. IF THE "L-ARMS FIGHT EACH OTHER, THE POSTS ARE NOT THE SAME AS THE BEAM.



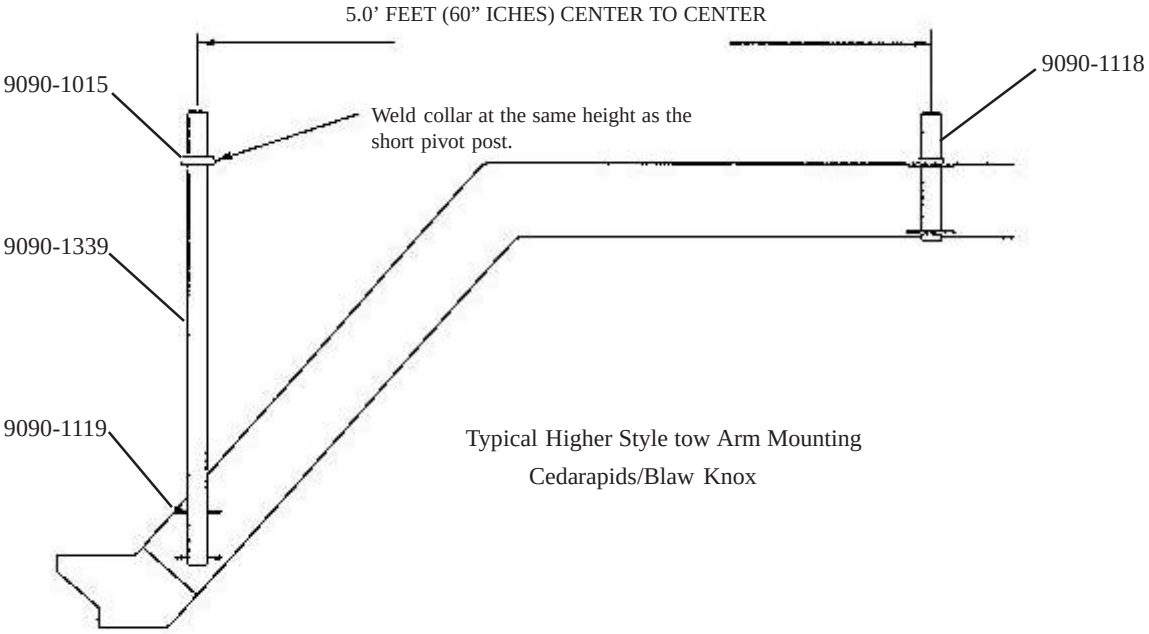
NOTES:

1. After welding tow arm pivot post perpendicular to the tow arm, install weld fixture / center portion of beam onto post and clamp in place.
2. Install long pivot post (9090-1339) into fixture / center portion of beam, butt collar (9090-1342) up against clamping block of the fixture, and tighten handle.
3. Place weld gussets (9090-1119) onto post and tack to tow arm. Check alignment prior to final welding.

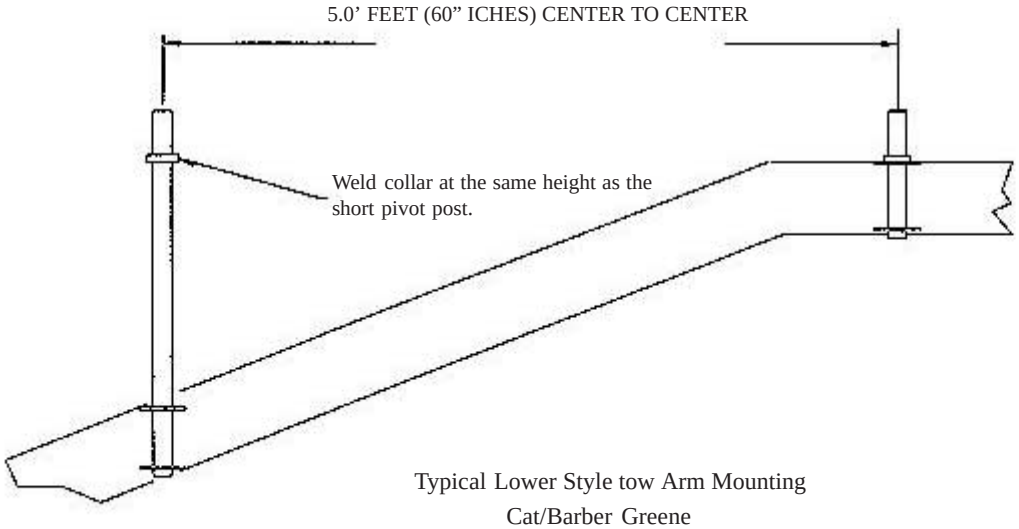
Cedarapids
A Terex Company

SMOOTHTRAC™
Sonic Averaging System (SAS)

Tow Arm Types



Typical Higher Style tow Arm Mounting
Cedarapids/Blaw Knox



Typical Lower Style tow Arm Mounting
Cat/Barber Greene

Cedarapids
A Terex Company

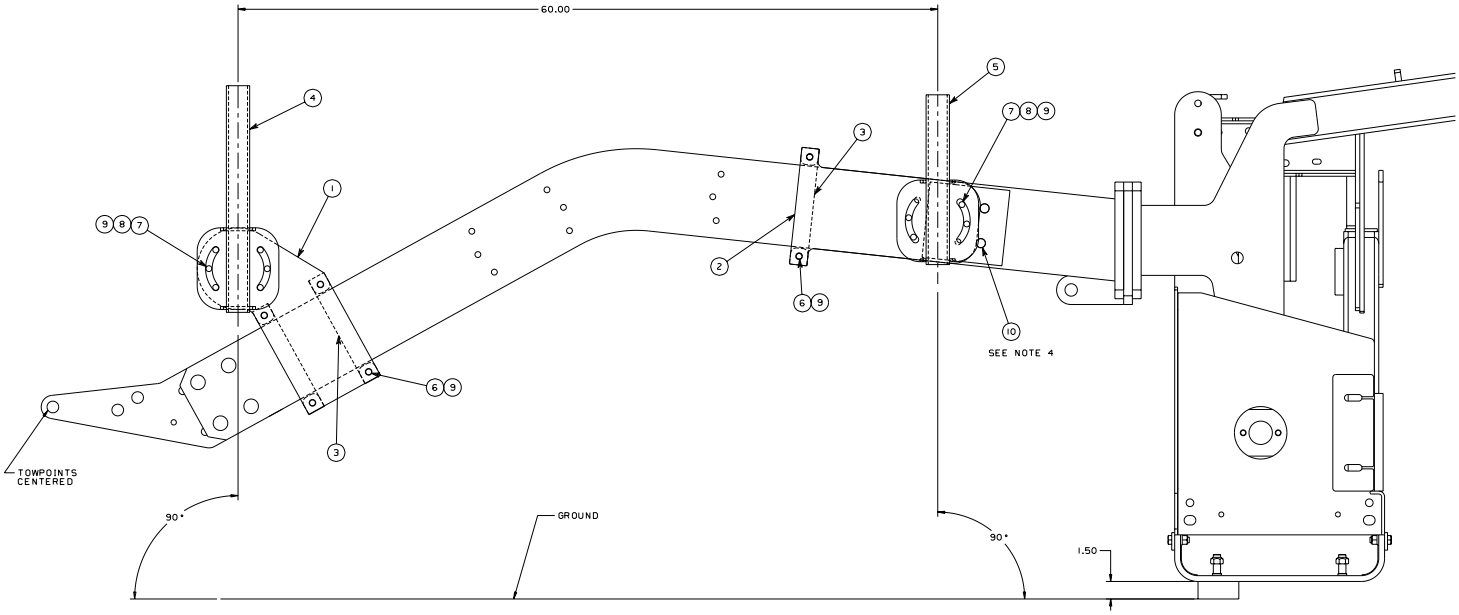
SMOOTHTRAC™
Sonic Averaging System (SAS)

CR300 Series Pavers

NOTES:

1. REST SCREED ON 1.50" HIGH BLOCK (2 X 4)
2. CENTER TOWPOINTS
3. NULL SCREED WITH HAND CRANKS
4. REMOVE EXISTING HARDWARE FROM SPACER BLOCK, INSTALL ITEM 2 WITH EXISTING LOCK WASHER AND ITEM 10 CAPSCREW.
5. MOUNT ITEM 5 AS SHOWN
6. TEMPORARILY INSTALL ITEMS 1, 3 AND 4
7. USING ASSEMBLED TOPCON BEAM FROM KIT, LOCATE AND TIGHTEN FRONT SUPPORT.

ITEM	LBS/ PIECE	PART NO./PATTERN NO.	DESCRIPTION	REQ.
1		09704-906-42	FRONT PLATE SAS	2
2		09704-906-50	BACK MOUNT	2
3		09704-906-44	CLAMP	6
4		09704-906-46	FRONT SUPPORT	2
5		09704-906-47	BACK SUPPORT	2
6		07383-070	CAPSCREW 1/2 NC X 1-1/2	12
7		07383-068	CAPSCREW 1/2 NC X 1	16
8		07014-020	1/2 WASHER	16
9		07014-005	LOCK WASHER 1/2	28
10		07383-120	CAPSCREW 3/4 NC X 2-1/2	4



LEFT HAND SHOWN RIGHT HAND OPPOSITE AND EQUAL

Cedarapids
A Terex Company

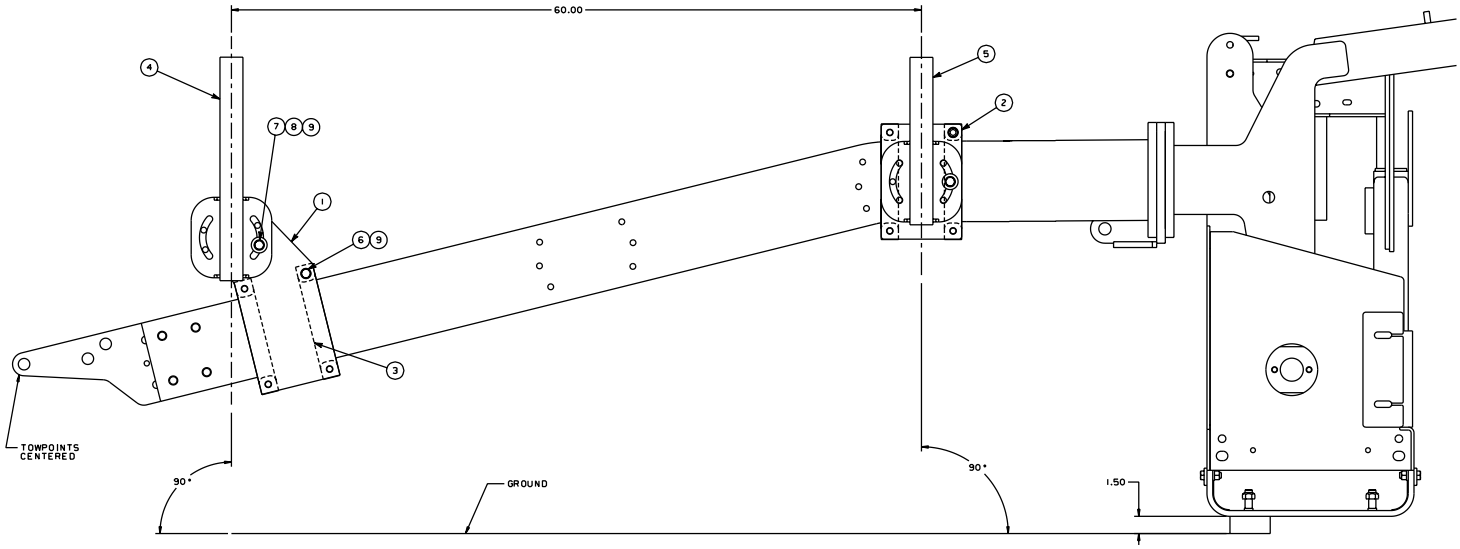
SMOOTHTRAC™
Sonic Averaging System (SAS)

CR400/CR500 Series Pavers

NOTES:

1. REST SCREED ON 1.50" HIGH BLOCK.
2. CENTER TOWPOINTS
3. NULL SCREED WITH HAND CRANKS.
4. TEMPORARILY INSTALL ITEMS 1, 2, 3, 4 & 5 AS SHOWN.
5. USE TOPCON BEAM FROM "SAS" KIT FOR FINAL LOCATION.

ITEM	LBS/ PIECE	PART NO./PATTERN NO	DESCRIPTION	REQ.
1		09704-906-42	FRONT PLATE SAS	2
2		09704-906-43	BACK PLATE SAS	2
3		09704-906-44	CLAMP	8
4		09704-906-46	FRONT SUPPORT	2
5		09704-906-47	BACK SUPPORT	2
6		07383-070	CAPSCREW 1/2 NC X 1-1/2	16
7		07383-068	CAPSCREW 1/2 NC X 1	16
8		07014-020	1/2 WASHER	16
9		07014-005	1/2 LOCK WASHER	32



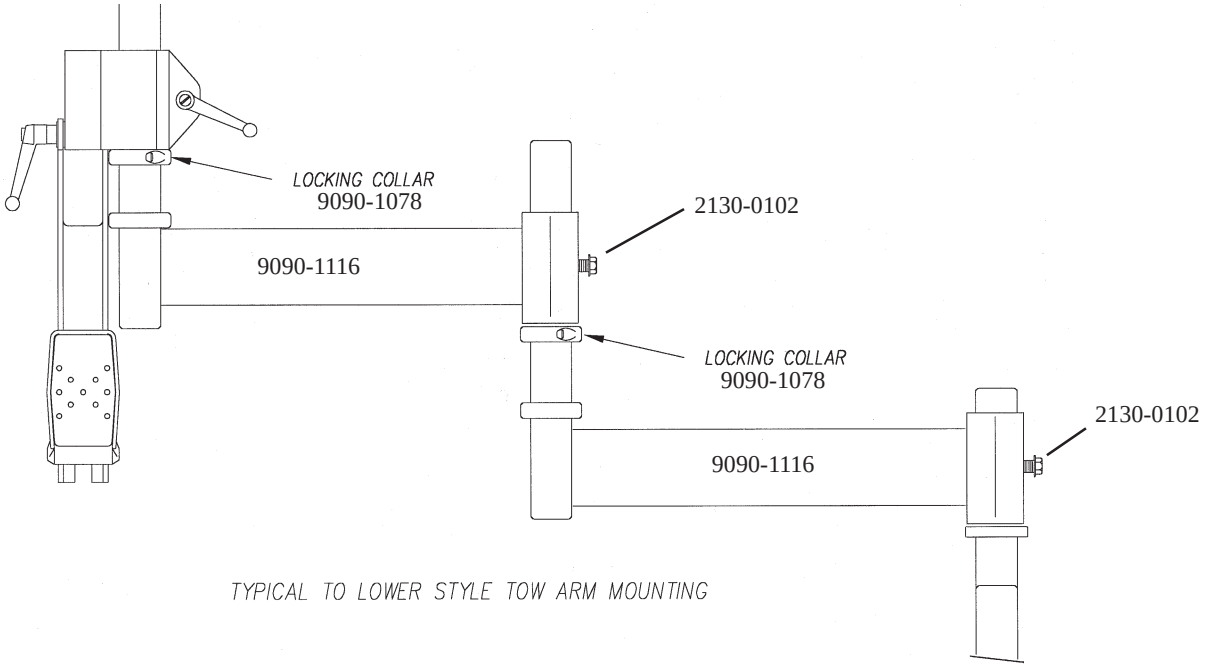
LEFT HAND SHOWN RIGHT HAND OPPOSITE AND EQUAL

Cedarapids
A Terex Company

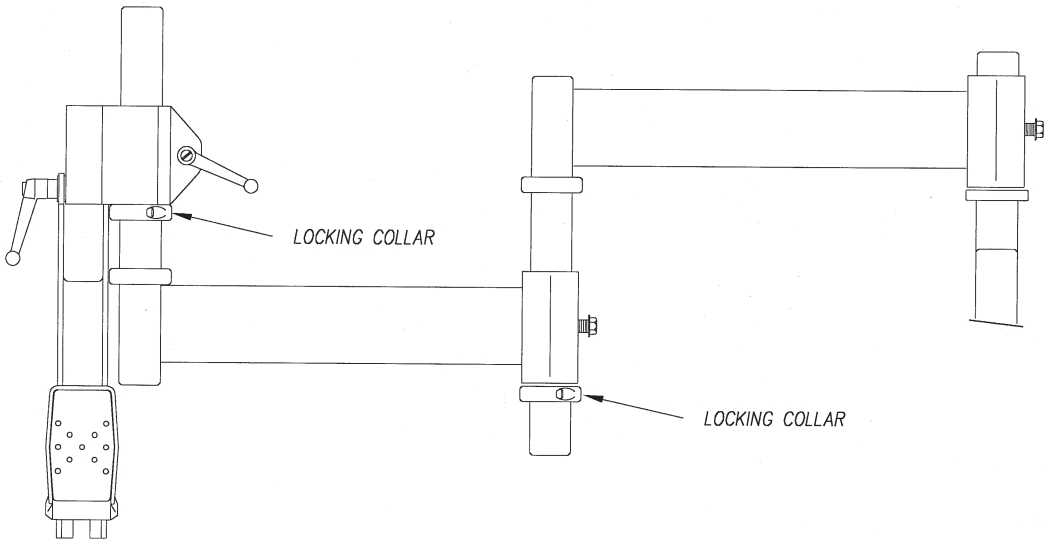
SMOOTHTRAC™
Sonic Averaging System (SAS)

Swing Arm Mounting

A. Either configuration may be typical to lower-height Tow Arm Mounting.



TYPICAL TO LOWER STYLE TOW ARM MOUNTING

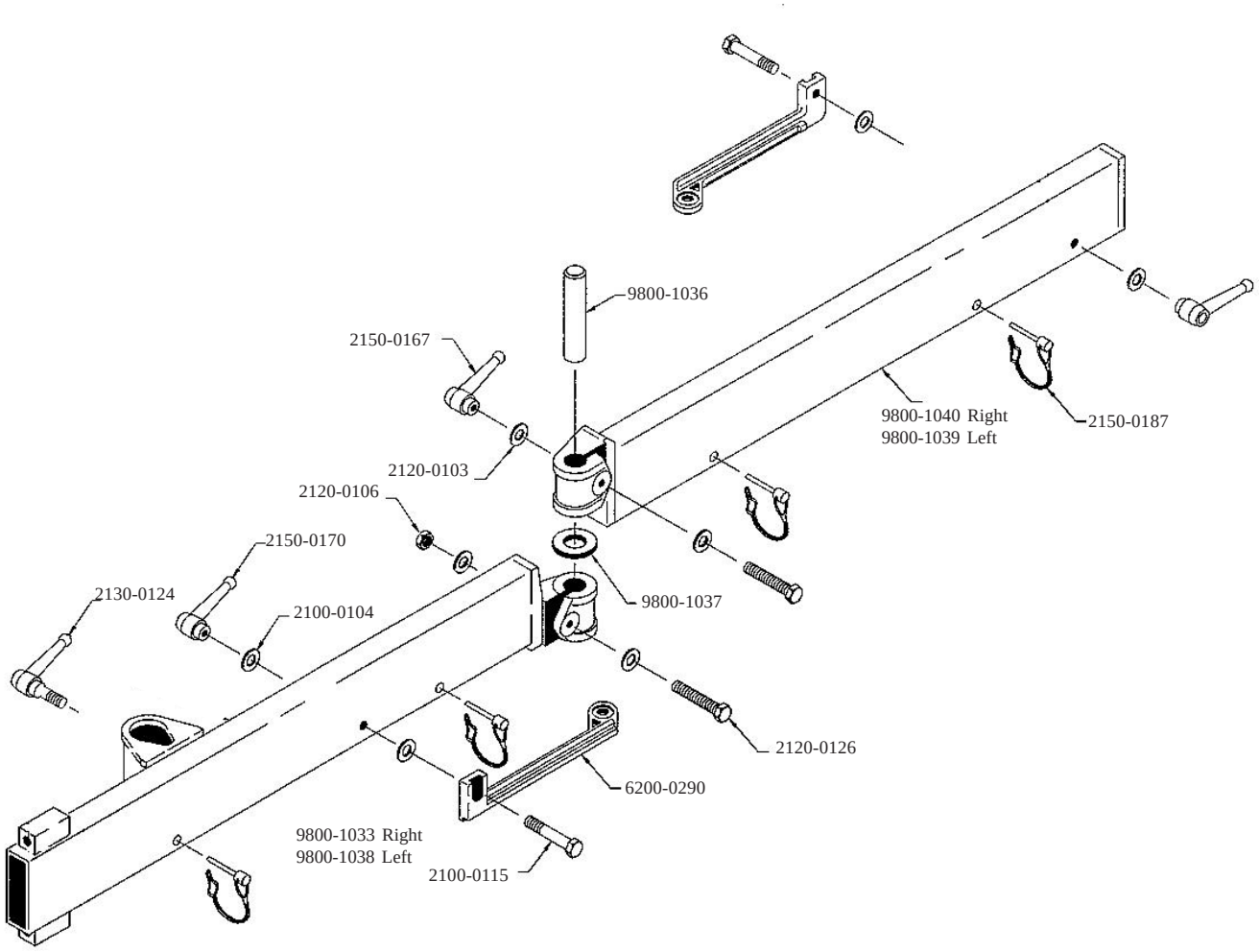


TYPICAL TO HIGHER STYLE TOW ARM MOUNTING

Cedarapids
A Terex Company

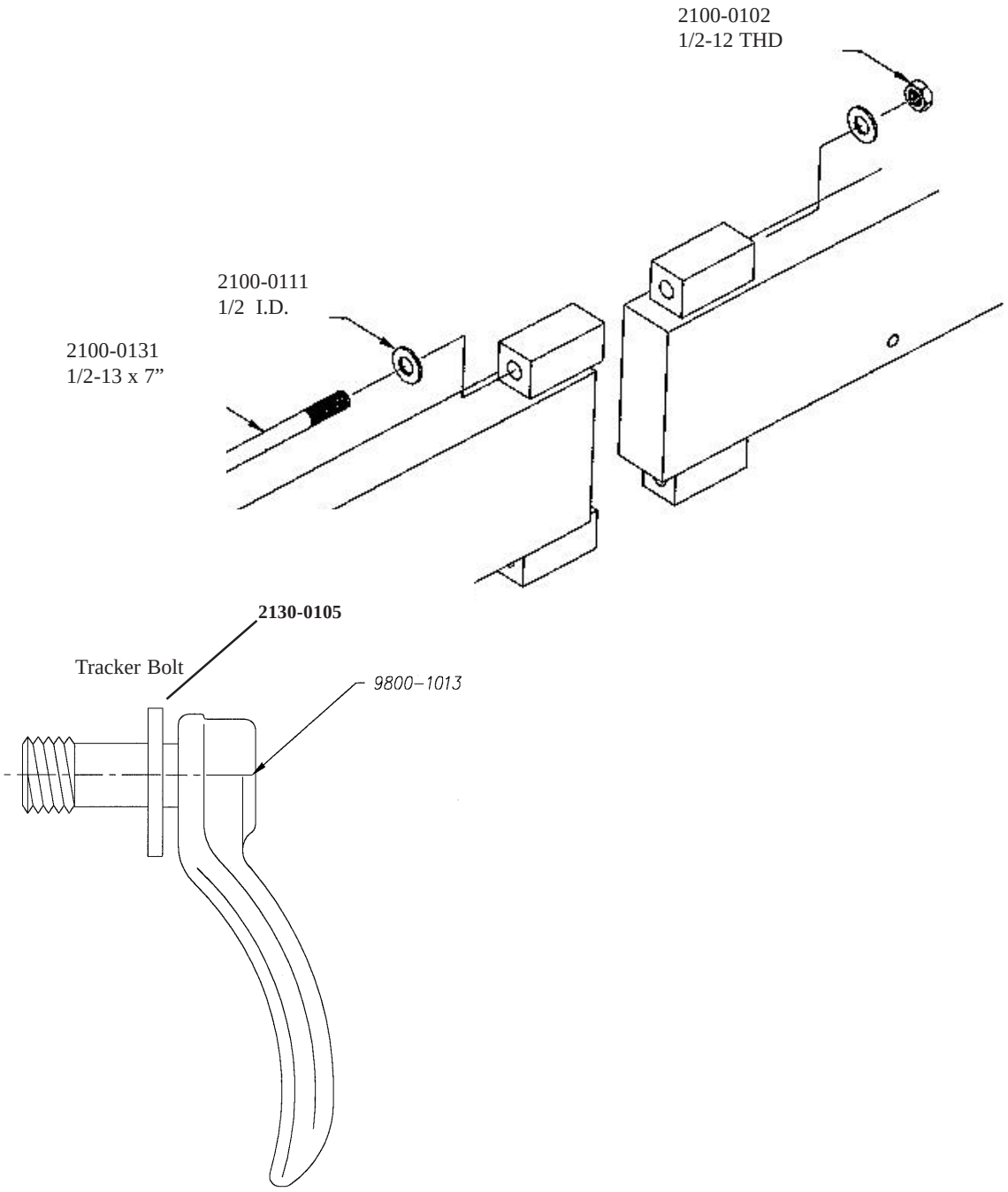
SMOOTHTRAC™
Sonic Averaging System (SAS)

Beam Assembly
Right Side Beam Shown



Cedarapids
A Terex Company

SMOOTHTRAC™
Sonic Averaging System (SAS)

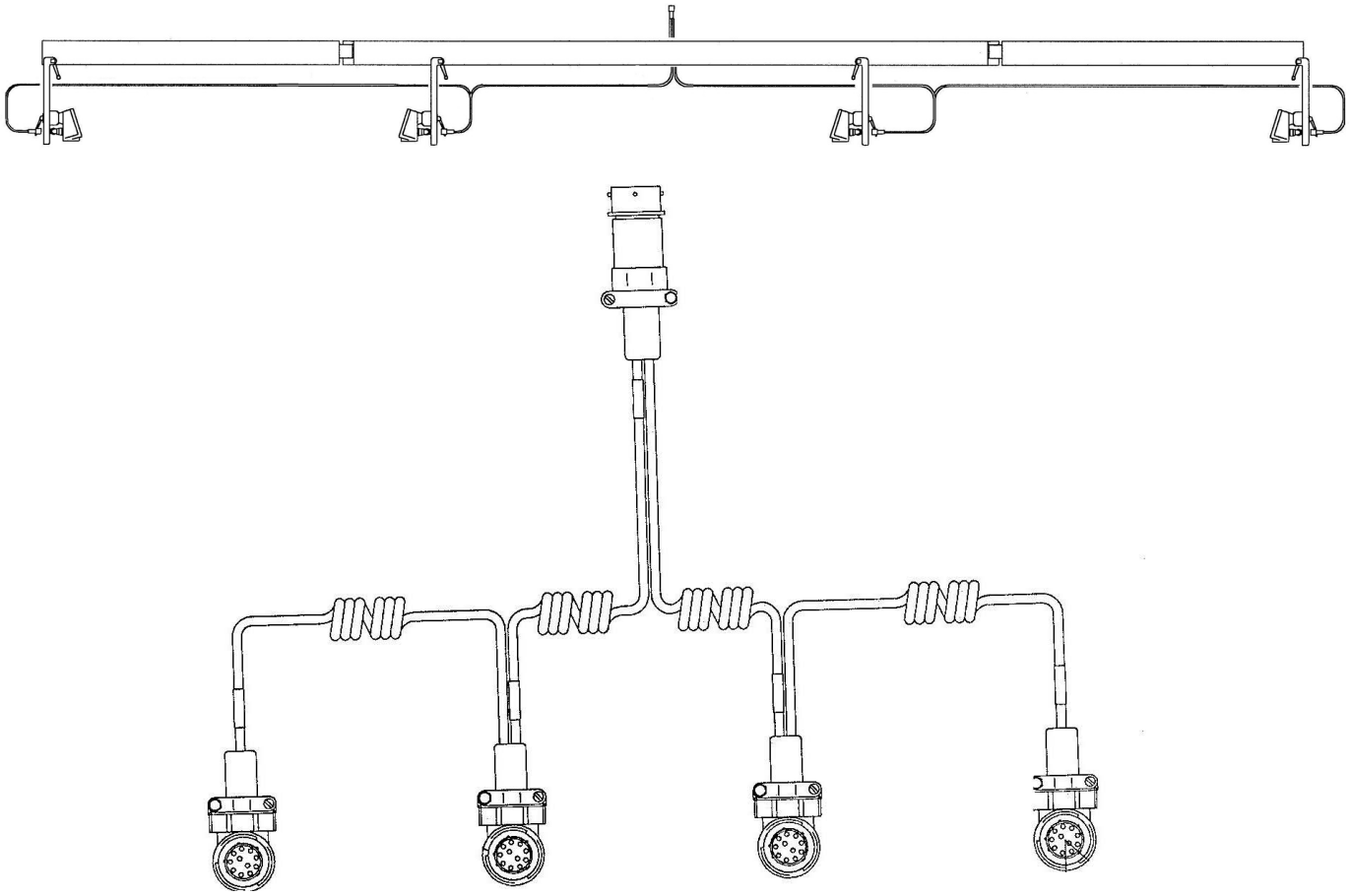


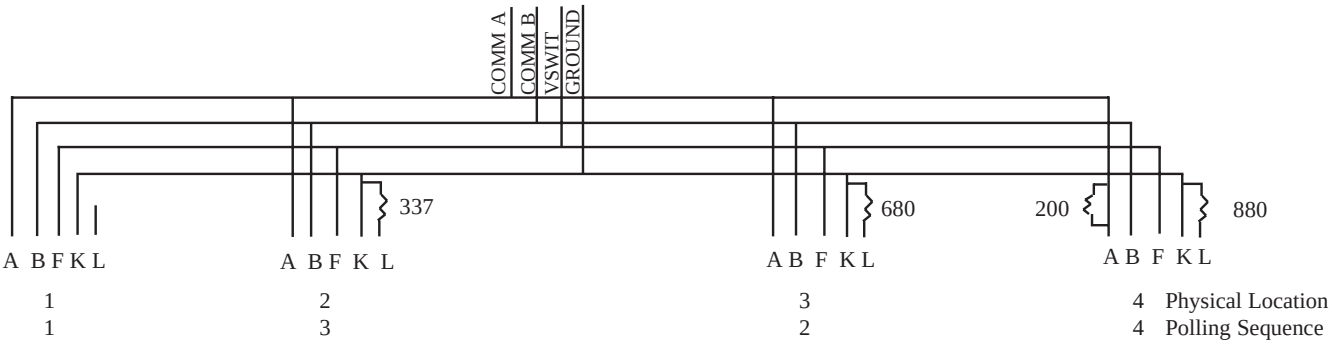
Cedarapids
A Terex Company

SMOOTHTRAC™
Sonic Averaging System (SAS)

SAS Cable

The 9060-5232 SAS Coil cable was designed to give the operator the felexability of relocating the the Sonic Trackers on the beam by drilling new mounting holes and moving the Tracker hanger.

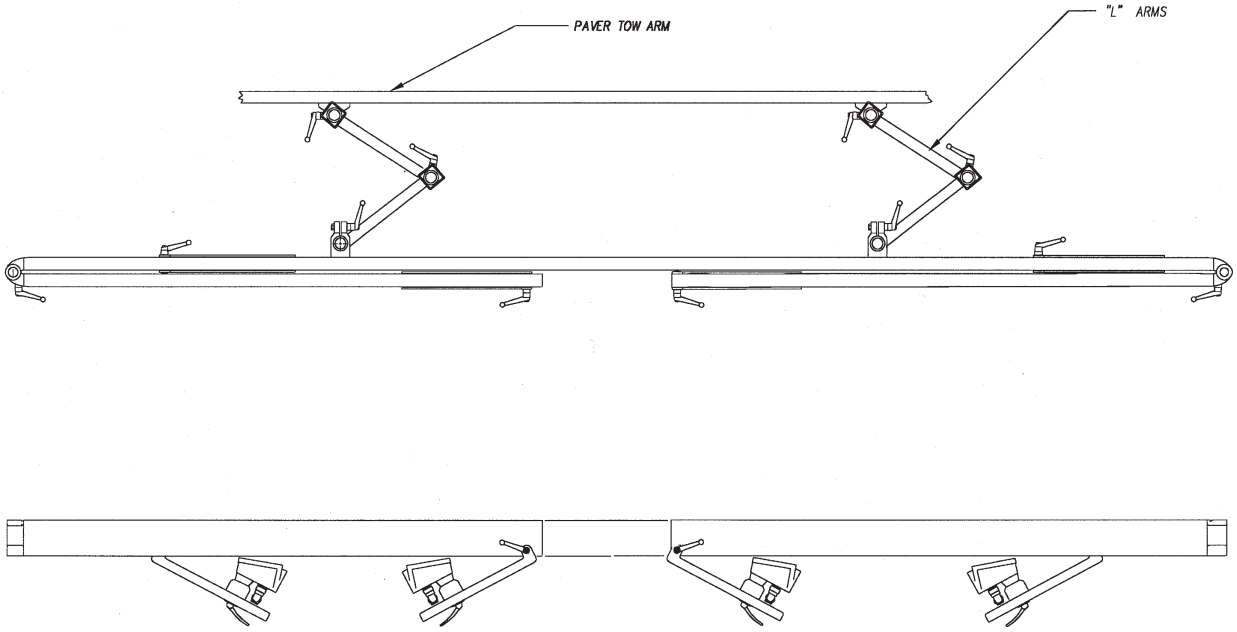




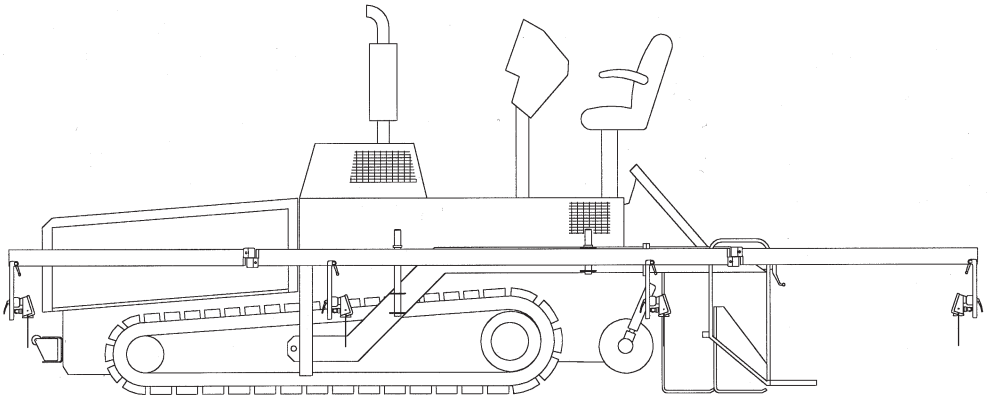
Cedarapids
A Terex Company

SMOOTHTRAC™
Sonic Averaging System (SAS)

Assembly Notes



ASSEMBLY FOLDED UNTO ITSELF DURING TRANSPORT ON JOBSITE



ASSEMBLY EXTENDED FOR USE

NOTES:

During any adjustment, alignment, or orientation of the beam assembly, especially the L arms, all clamps handles must be loosened to allow each section to move freely.

Caution: *Always tighten **ALL** clamp handles following every adjustment of the beam assembly. This is especially important during transport within the job site.*

Cedarapids
A Terex Company

SMOOTHTRAC™
Sonic Averaging System (SAS)

Control Box Setup Instructions for SAS Installation

Refer to the Topcon Paver System Four Operator's Manual (7010-0118) for accessing the System Four Performance settings. ***Confirm the Control Box Rev is 3.7 or higher and the Tracker Rev is 2.1 or higher (Both Control Box and Trackers should be labeled with SAS stickers).***

.

After entering the performance menu follow the steps below:

1. Set SS to equal the number of Trackers being used.
   Range OFF/2-10
2. Lower gains if system response is too quick causing rapid corrections.
3. The frequency setting in the technicians menu may need to be lowered to **3**, if the beam has an osciliation when the machine is sitting still.

Cedarapids
A Terex Company

SMOOTHTRAC™
Sonic Averaging System (SAS)

Placement of Sonic Averaging System

The center connection point of the SAS is the balance point. The position of the balance point to the tow arm is very critical. By moving the balance point, the performance of the system is greatly affected. The balance point of the beam should be located 1/3 to 2/3 the distance from the rear of the screed to the tow point cylinder.

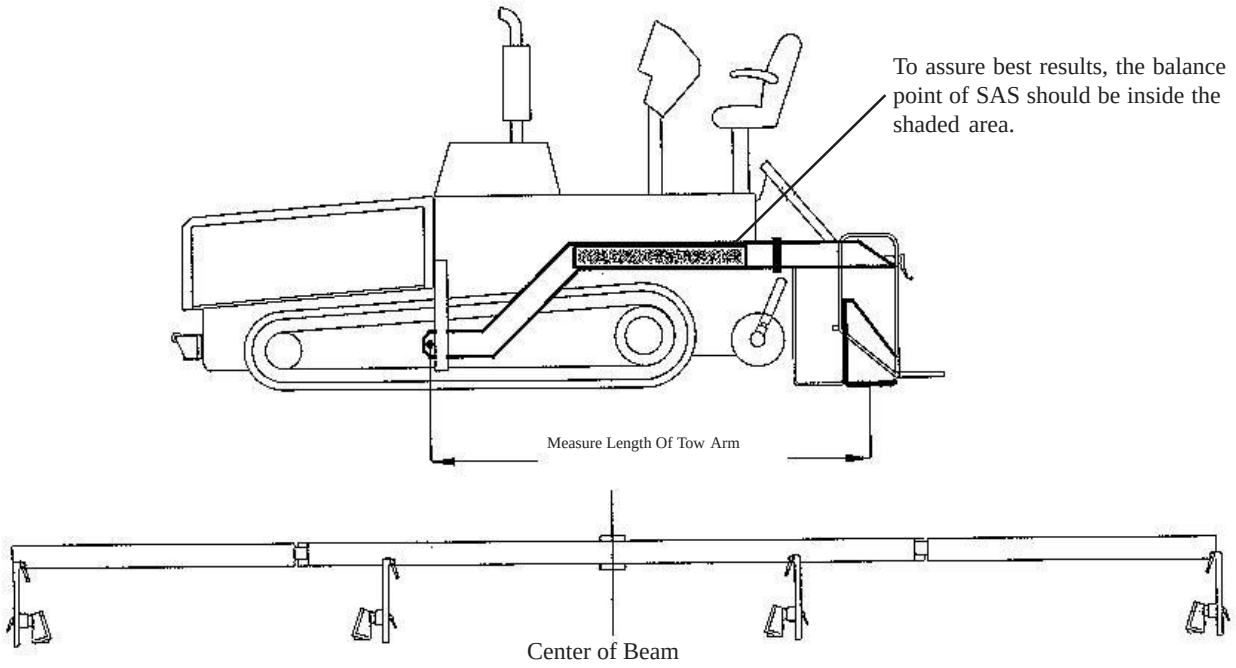
By placing the balance point near the back 1/3 (close to the screed), the systems will have a faster reaction time. By placing the balance point closer to the 2/3 point (near the tow point cylinder), the system will have a slower reaction time. For mainline paving, a slower reaction time is desired.

To determine where to position the SAS on your paver, start by measuring the length of the tow arm. Divide the total length by three. This will give you the placement of the balance point of the SAS on your machine.

OPERATION

1. Pave manually until specific mat thickness is established.
2. Turn system on, and set SAS to on-grade (refer to System Four Operator's Manual for survey information).
3. Pave as normal making thickness adjustments with control box knobs.

NOTE: BE SURE TEMP BAILS ARE INSTALLED BEFORE OPERATING



Cedarapids
A Terex Company

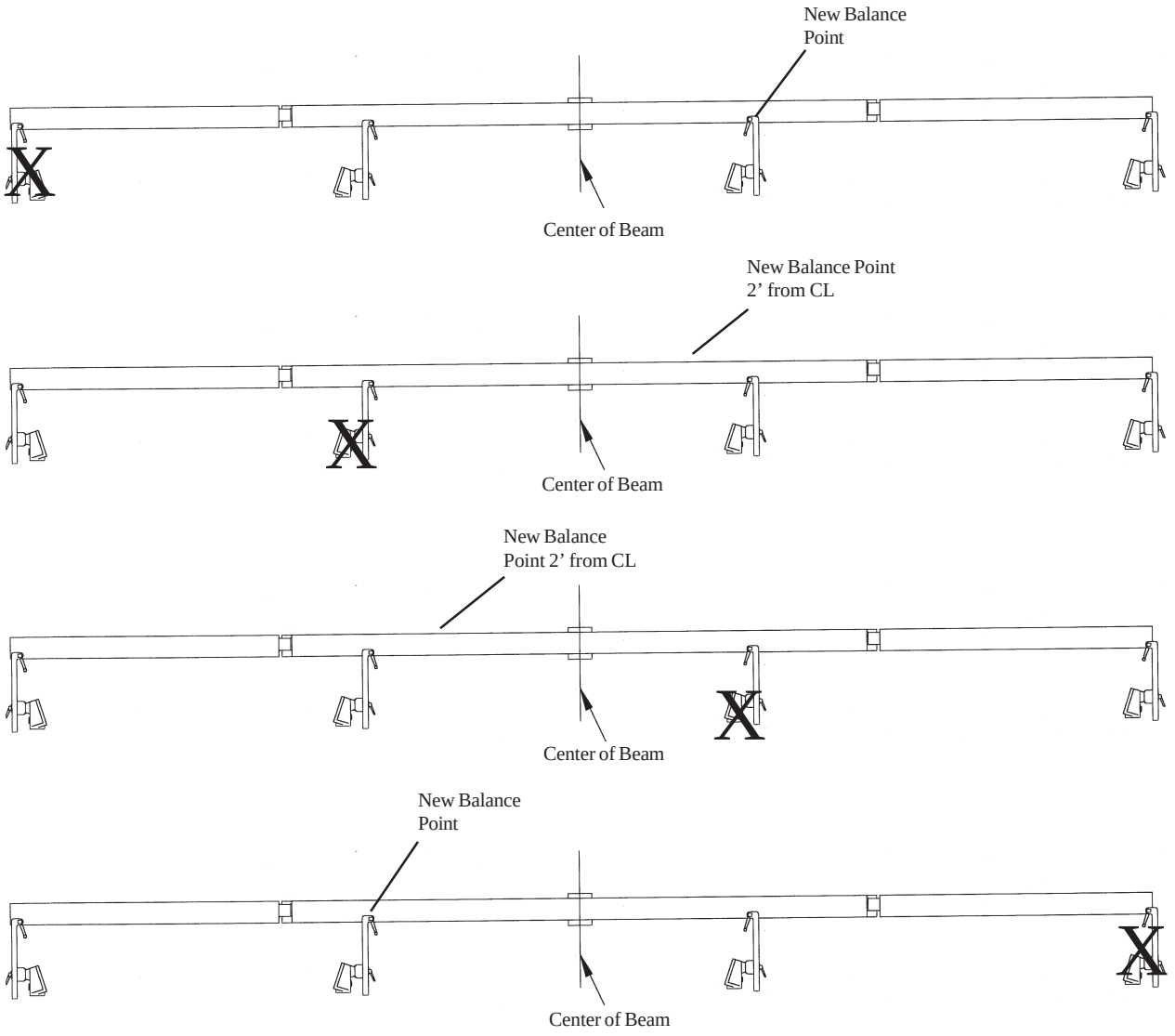
SMOOTHTRAC™
Sonic Averaging System (SAS)

OPERATION

The SAS system has been designed to continue to operate even when one of the Trackers fails. When a failure occurs, the control box will flash "ERR" preceded by a number "1-4." The number represents the Tracker which failed, making trouble- shooting easy and fast. **NOTE:** A number reading of "1" could mean the first or last Tracker has failed depending on which side the beam has been mounted. The SAS cable is labeled with numbers at each connector for easy identification. The system will ignore the Tracker which is causing the error and average the remaining three Trackers. **For best results, replace the faulty Tracker as soon as possible.**

Once one of the Trackers has been eliminated from the averaging, the balance point of the beam will have changed. If the faulty Tracker is not replaced the beam will need to be repositioned to adjust for the new balance point. It is strongly recommended, if the first or last Tracker fails, to replace it with one of the remaining Trackers from the middle of the beam. This will insure that the balance point is not outside of the 1/3 to 2/3 rule.

If any problems exist during operation or when the machine is stationary refer to page 13 for setup information.



Cedarapids
A Terex Company

SMOOTHTRAC™
Sonic Averaging System (SAS)