Owners Manual
Rigid Load System

Durham Geo-Enterprises, Inc.
2175 West Park Court
Stone Mountain GA 30087

Durham Geo-Enterprises Inc.

LG-11220

RIGID LOAD SYSTEM

Low load Device for LG-11225
12" Shear Box

Operator's Manual

Durham Geo-Enterprises, Inc.

Phone: 1-800-837-0864
Fax: 770-465-7447
Web Site: www.durhamgeo.com

All information, illustrations and specifications in this manual are based on the latest information available at the time of publication. We reserve the right to make changes at any time without notice and without incurring any obligation.

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FIRST RECORD THIS INFORMATION

Locate your machine's Model and Serial Number. Should you ever need to call for service, you will need these numbers. You'll find them on a plate on the front or bottom of your equipment.

Model # _____

Serial # _____

•Give both of these numbers if you ever need to call for service.

You will also find it convenient to have the following information.

Sold by: _____

Date Purchased: _____

THE OPERATOR SHOULD READ THIS ENTIRE MANUAL CAREFULLY BEFORE ATTEMPTING TO OPERATE THIS EQUIPMENT.

DANGER Indicates serious injury or death WILL result if instructions are not followed.

WARNING Indicates a strong possibility that serious personal injury or death may result if instructions are not followed.

CAUTION Indicates a possibility that minor injury could result if instructions are not followed.

NOTICE Indicates that equipment or property damage could result if instructions are not followed.

NOTE Gives helpful information.

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GENERAL INFORMATION

The Rigid Load System is design to allow the user of the LG-112, LG-113, LG-115 to apply loads at a low consistent rate that the normally supplied bladder system does not allow. This system will require compressed air (100psi max) to operate.

The Rigid Load System is a pneumatic loading device designed to apply loads instantaneously and to maintain the loads indefinitely on a test specimen. A constant load is maintained regardless of the rate of compression or the magnitude of consolidation.

Components of a Rigid Load System:

1) A pneumatic loading device

2) A Loading platen (approximately 12" X 12") to disperse the load being applied to the entire sample surface.

3) A compressed air source with a maximum pressure capacity of 120 psi and a maximum free-air capacity at 100 psi of 0.2 cfm is required.

3) The Rigid Load System is equipped to utilize an **optional** Displacement Transducer (E-311) to measure consolidation of the sample.

4) A rolling neoprene diaphragm is used to maintain a seal. It has the following characteristics:

   a) It is friction free
   b) There is no need for lubrication
   c) There is no break-away friction
   d) It has a very high sensitivity
   e) It has an extremely long life
   f) It is leak-proof
   g) Under normal usage, it will not require any service. It is not recommended that the piston cover plate be removed.

System Requirements

1) It will be necessary to connect the unit to a pressure supply. The valves have a 1/8"Swaglok compression fitting that will accept standard 1/8" nylon tubing.

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2) A pressure regulator with the capabilities of supplying the required CFM and pressure will be required, (E-658, and adapters to 1/8" tube connectors can be purchased from Durham Geo Enterprises, Inc).

3) It is also advisable to place a conventional air filter in the line close to the compressor.

PRESSURE READING DEVICES

Either a precision test gauge or a digital indicator with sufficient range and accuracy compatible with the requirements needs to be employed for measuring the pressure that is to be applied to the piston through the air regulator. An **Optional** Readout and transducer
Can be purchased (E-400 Digital Readout and E-124 0-150 PSI Pressure Transducer).
The Durham Geo digital indicator and transducer are capable of measuring to the limit of the pressure regulators which, of course, is only 100 psi.

We perhaps should now address the accuracy of the pressure measuring device. Accuracy should not be confused with sensitivity. Sensitivity implies the lease reading that can be observed. Accuracy implies the maximum deviation from actual that can occur at any point on the curve from an absolute value. With respect to this particular test, it is more meaningful to have repeatability of a reading than it is to have absolute value. Any of the 3 pressure measuring devices that are offered have excellent accuracy within the requirements of complying with ASTM. When we refer to a gauge as having an accuracy of 1/4 percent full scale and full scale is 30 psi, we are suggesting that the device is guaranteed to be accurate anywhere between 0 and 30 psi within 0.75 psi. With respect to a comparable 60 psi gauge, it would be guaranteed to be accurate anywhere within its 0 to 60 psi range within 0.15 psi. This guarantee relates only to the gauge itself and does not involve itself with the balance of the system.

GENERAL SUGGESTIONS

It is good practice to always take pressure readings regardless of the device being used in precisely the same fashion for consistent results. It is recommended that the pressure settings be made by approaching the value on the pressure measuring device slowly from below the number. This is true even for unloading sequences.

Installation and operation:

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Installation:

After unpacking and inspecting the equipment, refer to FIG 1. The Rigid Load System Has 4 strain rods attached to the upper plate. Familiarize yourself with FIG 1 before Continuing.

a) Remove the 8 hold down knobs on the bladder loading device. Remove the complete top assembly.

b) Remove the four ½ -20 set screws from the Top Box. A ¼ " allen wrench will be required. These set screws are to prevent soil and water damage to the female threads when not being used.

c) Prepare the sample.

d) Place the 12" X 12" loading platen (#2 Fig 1) into the upper box and on top of the sample.

Note: the Rigid Load system has a maximum travel of 1".

e) Loosen the strain rod holding nuts (#19 FIG 1).

f) Screw the 4 strain rods into the female threads on top of the top box. Make sure the rods are in completely, these rods will be under tension when the load is applied.

g) Tighten the locking nuts on the bottom of the strain rods to lock them in place.

h) Place the loading ball (#14 FIG 1) onto the concave seat in the center of the loading platen. It may be necessary to adjust the 8 retaining nuts on the top of the strain rod to raise or lower the complete unit.

i) Adjust the 8 retaining nuts so that the loading ball is contacting both concave receivers. Tighten the 8 retaining nuts on top of the stain rods, making sure the top plate is parallel to the top box, the strain rods should be 90 degrees to the top box.

j) Attach the required air supply. Open valve and apply load slowly.

Setting and applying the load:

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A calibration certificate is sent with each Rigid Load System. This calibration certificate will enable you to translate the psi reading on the indicator or gauge to pounds that are applied on the sample. Sequentially the procedure is as follows:

1) From the curve or by formula[1] , arrive at the load you want applied to the sample.

2) Determine the psi that should be shown on the pressure measuring device.

3) Open the valve on the Rigid Load Device and slowly rotate the pressure regulator clockwise until the desired psi shows on the pressure measuring device. The load is now instantaneously applied to the specimen.

4) When an additional load increment is desired simply repeat the above procedure.

5) To remove the load turn the regulator counter-clockwise to decrease pressure Until the load on the sample has been removed.

INSTALLATION OF THE DISPLACMENT TRANSDUCER:

Attached to the bottom plate is a a fixture (#25 FIG 1) which is designed to accommodate a Linear Displacement Transducer. The LDT will extend down to the contact bar already installed (#5 FIG 1). If this option has been purchased, please refer to the manual and calibration certificate that will accompany that transducer.

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WARRANTY STATEMENT

Durham Geo Enterprises, Inc. warrants that equipment shall be free from defects in material and workmanship for a period of **90 days** from the time equipment is put into service. In any event, the warranty period will not exceed **6 months** from the date of shipment.

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Durham Geo Enterprises, Inc. liability shall be limited to replacement of components or equipment (at the manufacturer's discretion) that have been determined by the manufacturer to be faulty. No claims in excess of component replacement value will be recognized. Durham Geo Enterprises, Inc. will not be held liable for damages or lost business relating to a warranty claim.

Specifically excluded from this warranty are claims deemed by the manufacturer to have resulted from normal wear and tear, improper use, or abuse of the equipment.

For a complete warranty disclosure, please call 1-800-837-0864 (outside Georgia) or 770-465-7557 (inside Georgia) refer to the printed statement on the back of any Durham-Geo Enterprises, Inc. original invoice.

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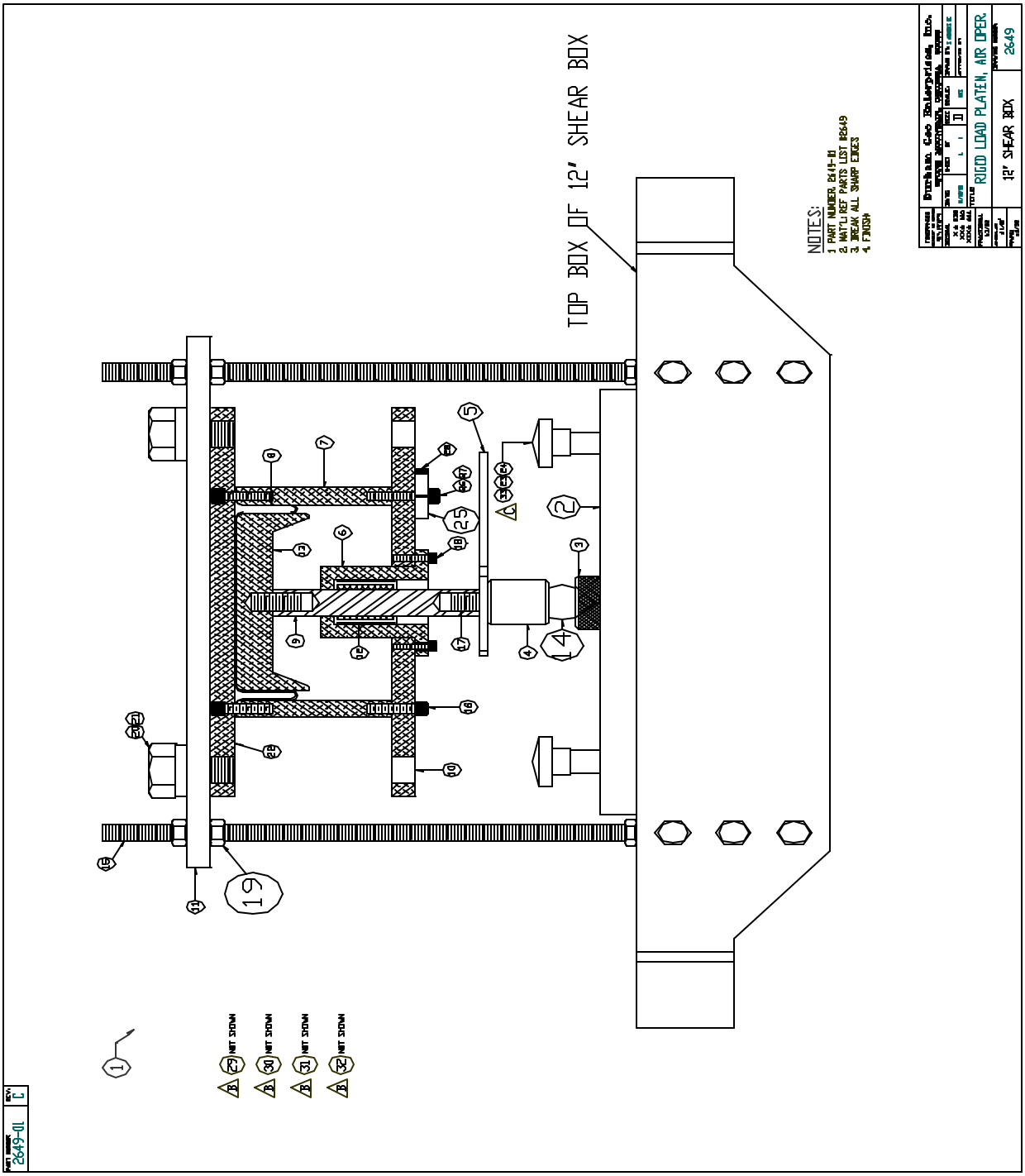

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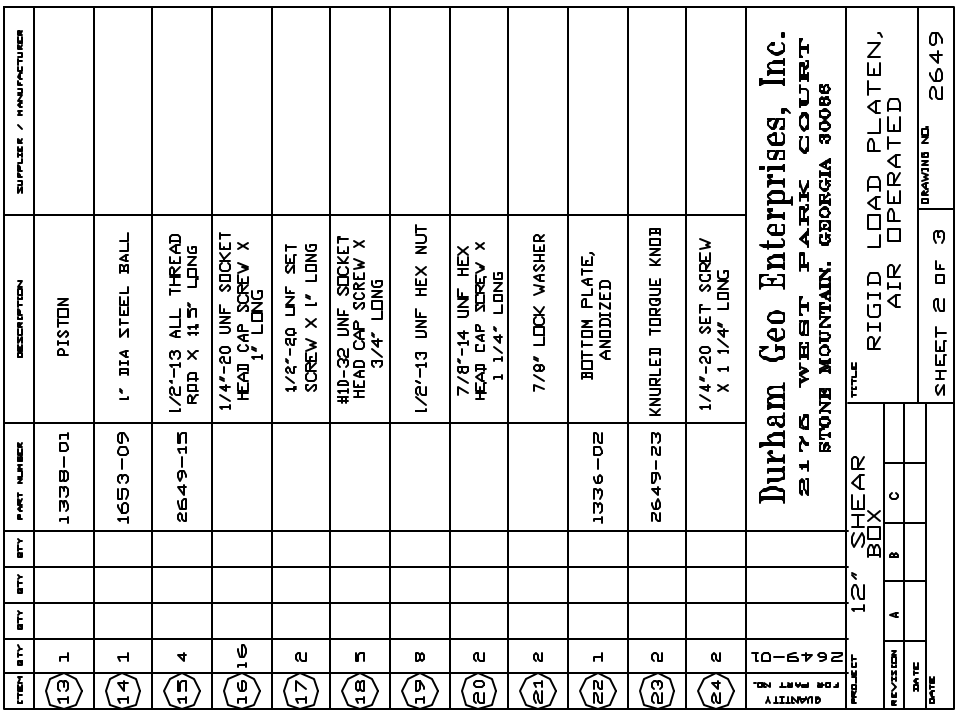

ITEM	QTY	QTY	QTY	PART NUMBER	DESCRIPTION	SUPPLIER / MANUFACTURER
1	X			2649-01	RIGID LOAD PLATEN, AIR OPERATED	
2	1			2646-01	LOADING PLATEN	
3	1			2648-01	LOADING BALL SEAT	
4	1			1556-01	ADAPTOR, T-CELL LOAD ROD TO 'S' LOAD CELL	
5	1			1615-01	DIAL INDICATOR PICK-UP BAR	
6	1			2451-02	BEARING HOUSING, TOP PLATE, ANODIZED	
7	1			1337-02	CYLINDER, ANODIZED	
8	1			1330-05	ROLLING DIAPHRAM, 550 BORE, X 500 PISTON	
9	1			2446-01	PISTON SHAFT	
10	1			2448-02	TOP PLATE, ANODIZED	
11	1			2647-01	LOADING BAR	
12	1			2440-07	BEARING, LINEAR BALL BUSHING	
QUANTITY PER UNIT	TO-6492					
PROJECT	12" SHEAR BOX			Durham Geo Enterprises, Inc. 2175 WEST PARK COURT STONE MOUNTAIN, GEORGIA 30088		
REVISION	A	B	C	TITLE	RIGID LOAD PLATEN, AIR OPERATED	
DATE				SHEET 1 OF 3	DRAWING NO. 2649	
DATE						

ITEM	QTY	QTY	QTY	PART NUMBER	DESCRIPTION	SUPPLIER / MANUFACTURER
13	1			1338-01	PISTON	
14	1			1653-09	1" DIA STEEL BALL	
15	4			2649-15	1/2"-13 ALL THREAD ROD X 11.5" LONG	
16	16				1/4"-20 UNF SOCKET HEAD CAP SCREW X 1" LONG	
17	2				1/2"-20 UNF SET SCREW X 1" LONG	
18	5				#10-32 UNF SOCKET HEAD CAP SCREW X 3/4" LONG	
19	8				1/2"-13 UNF HEX NUT	
20	2				7/8"-14 UNF HEX HEAD CAP SCREW X 1 1/4" LONG	
21	2				7/8" LOCK WASHER	
22	1			1336-02	BOTTOM PLATE, ANODIZED	
23	2			2649-23	KNURLED TORQUE KNOB	
24	2				1/4"-20 SET SCREW X 1 1/4" LONG	
QUANTITY PER UNIT	TO-6492					
PROJECT	12" SHEAR BOX			Durham Geo Enterprises, Inc. 2175 WEST PARK COURT STONE MOUNTAIN, GEORGIA 30088		
REVISION	A	B	C	TITLE	RIGID LOAD PLATEN, AIR OPERATED	
DATE				SHEET 2 OF 3	DRAWING NO. 2649	
DATE						

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ITEM	QTY	QTY	QTY	QTY	PART NUMBER	DESCRIPTION
25	1				1584-01	LVDT TO T-CELL ADAPT.
26	1					1/4"-20 UNC HEX HEAD CAP SCREW X 1" LONG
27	1					1/4"-20 UNC HEX NUT
28	1					#8 - 32 UNC SOCKET HEAD CAP SCREW X 1 1/4" LONG
29	1				2151-001	CONNECTOR, MALE, BRASS, 1/8" TB X 1/8" MNPT
30	1				2152-002	VALVE, BRASS, 2-WAY, ON-OFF
31	1				2010-01	HOLDER, VALVE
32	2'				G-52508	1/8" NYLON TUBING
33	2				2649-33	SPACER, ALUMINUM, 5/8" OD X 3/8" ID X 5/8" LONG

DUANTITY FOR PART NO 6649-01

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STONE MOUNTAIN, GEORGIA 30086

PROJECT 12" SHEAR BOX

RIGID LOAD PLATEN,
DRAWING NO. 2649
SHEET 3 OF 3