Gas Struts For Loading Arms

Tech Talk #34

WHY ARE GAS STRUTS USED?

The gas struts employed by Liquip is the same principle as those used on your car hatch-back. Their prime characteristic is an almost constant force throughout the stroke. What this means in practice is that having adjusted the gas strut for operation at the average truck adaptor height, movement up or down from this position requires very little force. Contrast this with the effort needed with the old style balance systems, particularly when the arm is moved significantly up or down from its normal rest position. These gas struts are also maintenance free, however they should be replaced if necessary.

WHICH ARMS TAKE WHICH GAS STRUT?

Style of Arm & Size	Qty. of Gas Struts Required	Part No. of Strut	Force	Length (mm)
Mark 2 (4")	2	4416	2800N	525
Mark 3 (4")	1	3008	5200N	525
Mark 3 (2")	1	3008	5200N	525
Long Reach				
(i) Dry Break	2	3008	5200N	525
(ii) Vapour	2	4416	2800N	525
(iii) Spear	2	4416	2800N	525
Pantograph (4")	2	4450	3200N	830
Pantograph MK 3 (4" or 3")	1	4450	3200N	830
Bitumen	No Struts	Hydraulic or Pneumatic		

These are as a guide only as the 2 shorter struts are interchangeable when necessary.

HOW TO RECOGNISE THE DIFFERENT GAS STRUTS.

The different gas struts can be identified by the information on the side of the strut. This will state either 2800N, 5200N, 3200N etc. Visually the difference is there are 2 different lengths and either black or green leather boots (see drawing on last page for details). Once this information is known we are able to locate the correct gas strut.

Note: All gas struts are now supplied with the leather boot and nylon ties.

Key Features When Adjusting Balance Assemblies With Gas Struts.

- Ensure struts do not foul any hardware.
- Fill the arm with product before adjusting.
- Ensure that the strut has been installed with the leather boot downward for proper internal lubrication (the gas strut indicates the correct way to install).
- On the following pages are drawings of the gas strut set up for each style of loading arm. This illustrates the direction the adjustment screw needs to go to get your desired result.

HOW TO IDENTIFY A DAMAGED GAS STRUT.

- Oil leakage at bottom.
- It will be loose on spindles (before an adjustment is made).

HOW TO REPLACE A DAMAGED GAS STRUT.

*** MARK 2:** Lift and support the arm and adjust the upper pivot pin towards the intermediate swivel until the struts are loose on the pivot (approximately centre of the adjusting brackets). We suggest a block and tackle or similar is the safest way to raise the loading arm. If using a powered device, such as a forklift, extreme care must be taken to avoid damaging the loading arm.

Remove split pins and slide the old gas strut off. Removing from the bottom pivot pin first. Slide on the new strut, fitting to the top pivot pin first, then fit to bottom pin, fasten clips. Then all that is required is the readjusting of the loading arm.

*** MARK 3 (ALL STYLES):** Lift the horizontal pipe upward carefully and slowly until the gas spring reaches the end of it's stroke. Support or secure the arm in this position. Remove the split pins in the bottom pivot pin and remove the pin. Remove the two bolts holding the adjusting slide front cover and remove the slider front plate. Slide out the slider block, remove the upper strut pin, remove the old gas strut and fit the new gas strut into the groove ensuring the leather boot of the strut hangs downward and refit the upper strut pin back into the slider block. Refit the slider block into the slider channel and secure the front slider plate. Fit the bottom pivot pin into the front hole (or the original hole it was fitted), fit the lower pivot pin split pins. Then readjust the loading arm.

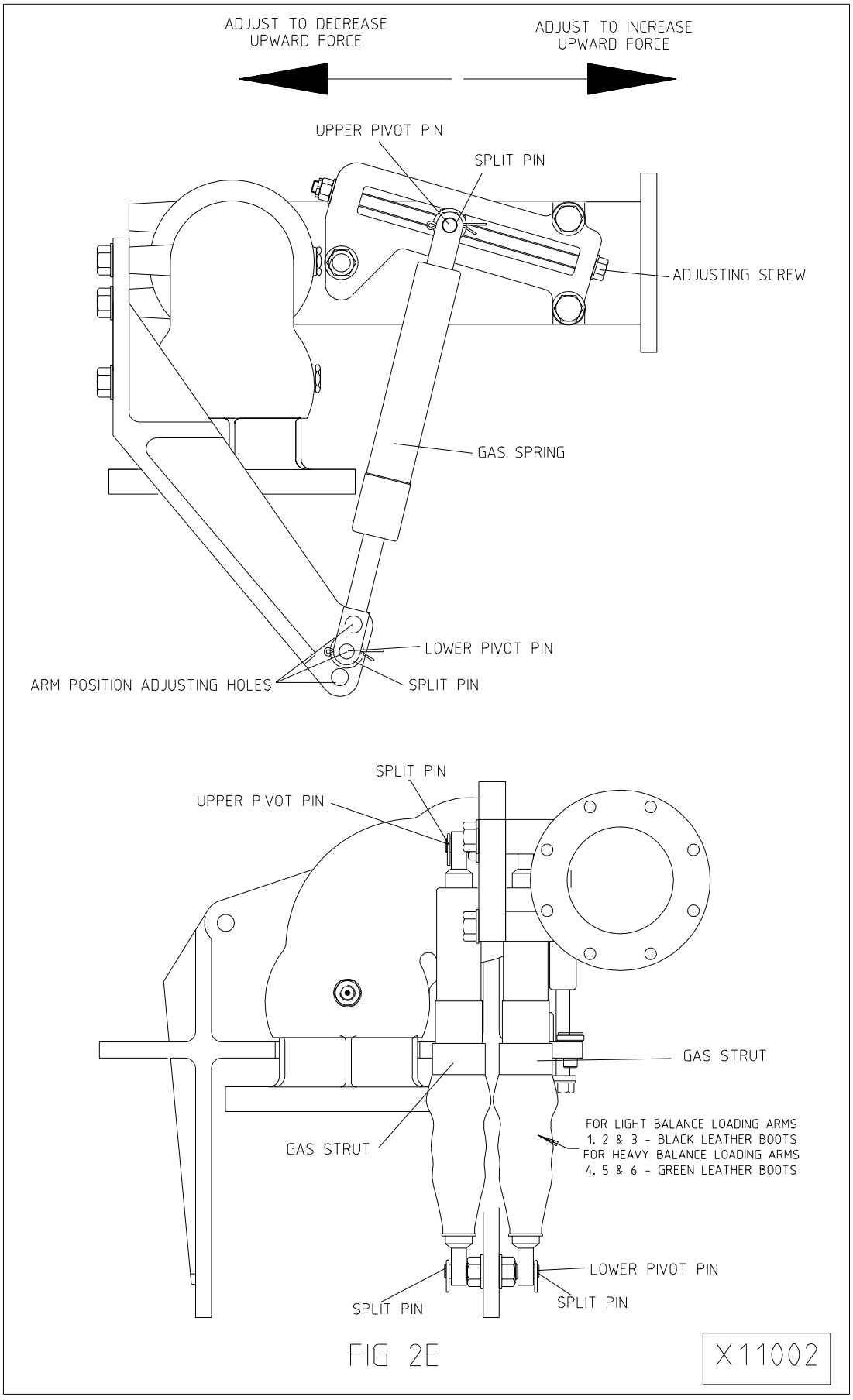
*** LONG REACH:** Suitably support the intermediate swivel and lift until upper limit stop nut is hard against the drop leg bracket. Adjust the inboard pivot downwards until the struts are loose on the pivot. Remove the split pins and slide the old gas strut off. Slide on the new gas strut, fit split pins and then readjust the loading arm.

*** MARK 2 PANTOGRAPH:** Adjust the inboard pivot pin downwards until the struts are loose on the pivot. The outboard pivot pin can also be adjusted downwards until the struts are loose on the pivot pins. Remove split pins and slide old gas strut off. Slide the new strut on, replace the split pins, wind upper and lower limit adjusting bolts back to previous positions. Then readjust loading arm. *Tip: When adjusting the gas struts have the intermediate swivel in a position where it is between being fully extended and in the parked position.*

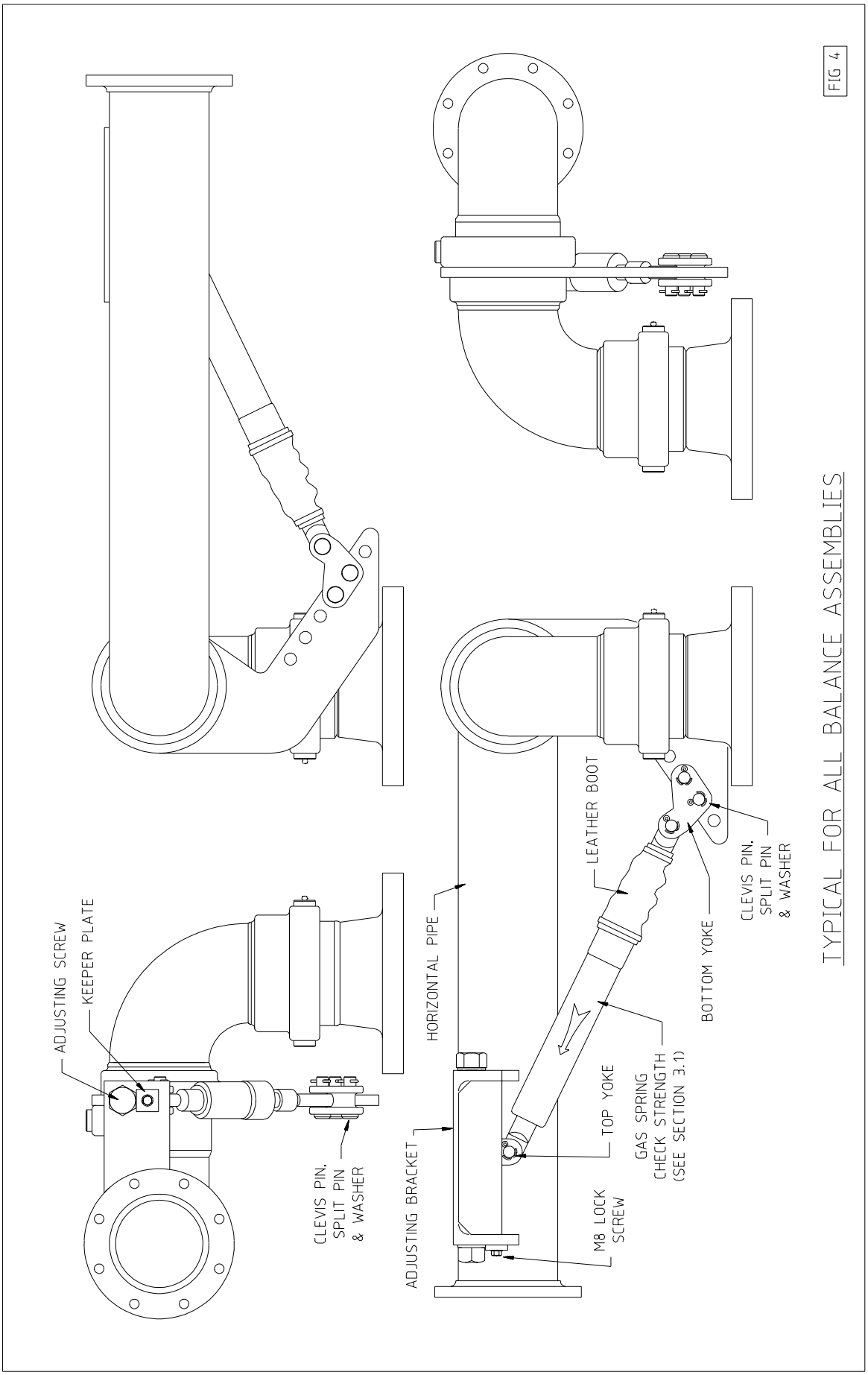
*** MARK 3 PANTOGRAPH:** Support the loading arm. Loosen the pipe clamp supporting the top pivot point. Remove the split pins and washers. Remove the damaged strut and replace the new one. Replace the split pins and washers. Push the loading arm into its most vertical position then adjust the top pivot pipe clamp so that the pivot is parallel to the lower pivot and again clamp. Then readjust the loading arm.

Note: If the product is changed in the loading arm, it may need to be readjusted.

VNB-I4 Balance assembly for MK2 loading arms



VBB & VBT Balance Assemblies for MK3 Loading Arms



Long Reach Style loading Arm

Dry Break (LTD4 balance assembly)

Spear (LRS4 balance assembly)

Vapour (LRS4 balance assembly)

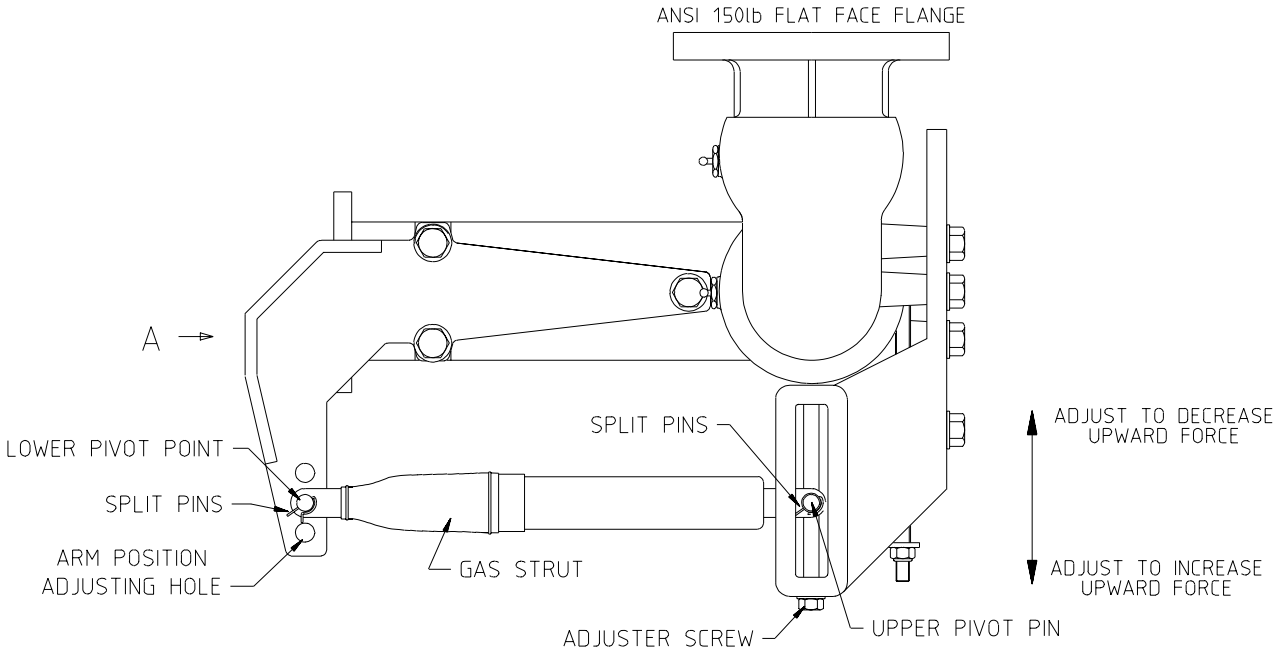


FIG B

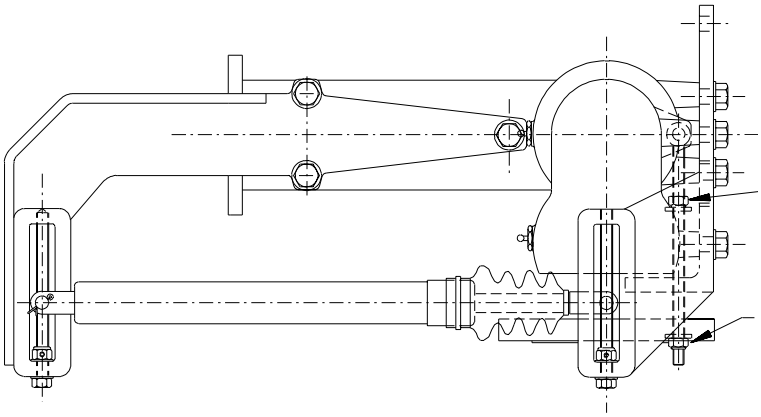
X11000

LTS4 Balance Assembly
Used for Pantograph Loading Arms

Weaker ↑

Stronger ↓

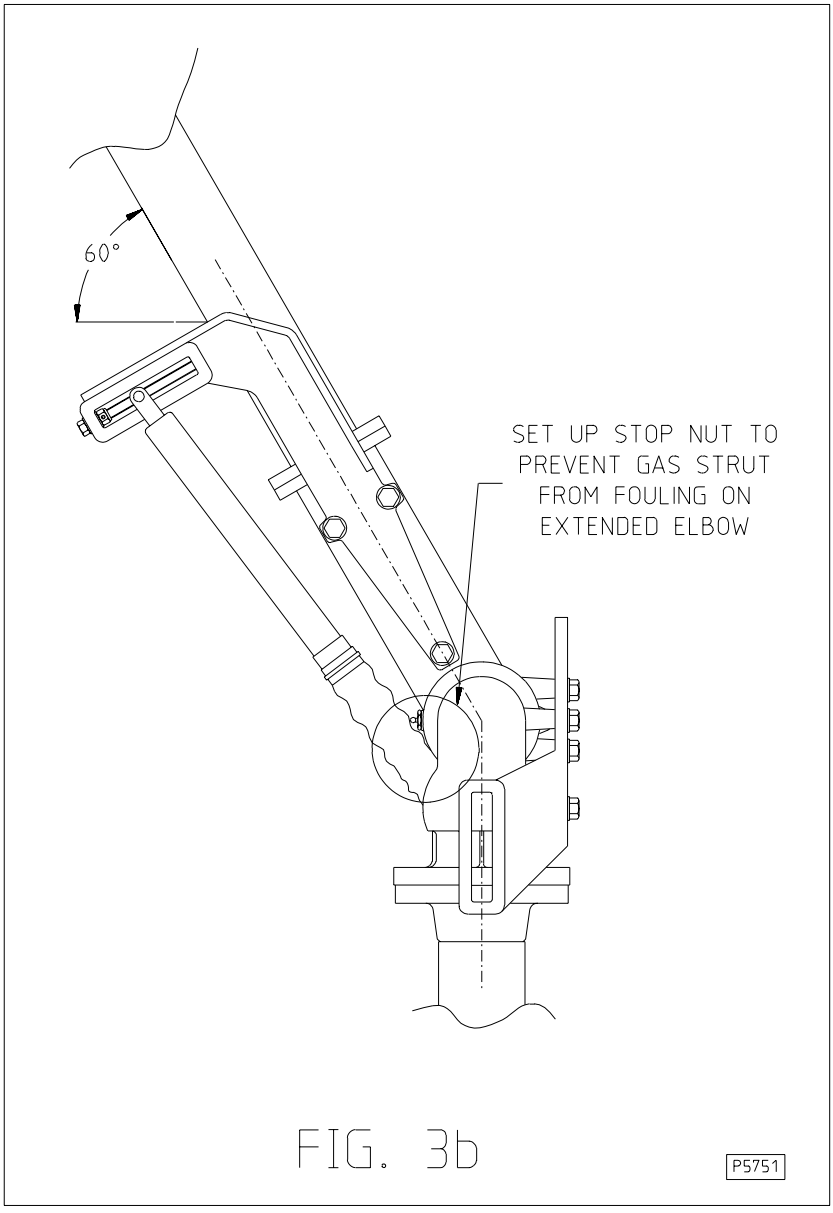
Fine Adjustment



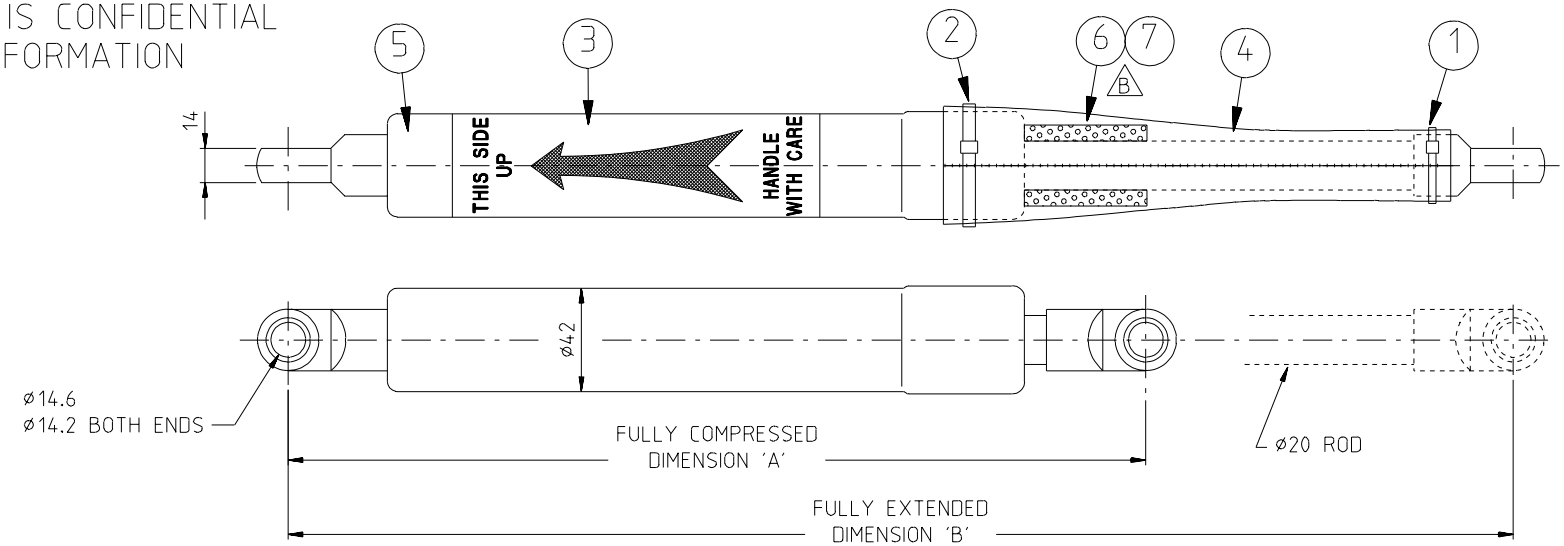
↑ Weaker

↓ Stronger

Coarse Adjustment



THIS IS CONFIDENTIAL INFORMATION



	ITEM	PART NO	DESCRIPTION	3008 QTY	4416 QTY	4450 QTY	DRAWING No
	1	1417	NYLON TIE BLACK 368mm LONG	1	1	1	
	2	5614	NYLON TIE BLACK 186mm LONG x 5mm WIDE	1	1	1	
	3	6349	LABEL - THIS SIDE UP HANDLE WITH CARE	1	1	1	
	4	4237	PROTECTIVE BOOT - BLACK LEATHER	1			P4237
B		5836	PROTECTIVE BOOT - GREEN LEATHER		1		P4237
		5752	PROTECTIVE BOOT - BLACK LEATHER			1	P5752
	5	70960	SPRING GAS STRUT 2800N		1		
		70961	SPRING GAS STRUT 5200N	1			
		70962	SPRING GAS STRUT 3200N - 800mm LONG			1	
B	6	5863	GREASING SPONGE 33 OD, 20 ID, 50 LONG	1	1	1	
	7	5864	SHELL STAMINA GREASE (RL2 OR EL2)	AS REQ'D	AS REQ'D	AS REQ'D	
	FULLY COMPRESSED LENGTH OF STRUT DIMENSION 'A' (mm)			350	350	500	
	FULLY EXTENDED LENGTH OF STRUT DIMENSION 'B' (mm)			500	500	800	

NOTES:
1- WHEN STORING STRUT, ENSURE ARROW ON SIDE IS FACING UP (IE. PISTON ROD IS DOWN) TO KEEP SEALS FROM DRYING OUT.
2- PISTON ROD FINISH IS CRITICAL FOR THE SEALING OF THE STRUT, (SIMILAR TO A HYDRAULIC OR PNEUMATIC CYLINDER PISTON). IT IS VERY IMPORTANT NOT TO DAMAGE THE STRUT OR CHANGE THE FINISH. AVOID CLAMPING OR GRIPPING, LEVERING AGAINST, HAMMERING, BUFFING OR GRINDING, CORROSIVE SUBSTANCES AND PAINTING (OR OVERSPRAY).

ISSUE	DETAILS	BY	DATE
B	5836, ITEMS 6 & 7 AND NOTES 1 & 2 ADDED	AS	24/2/00
A	ORIGINAL ISSUE		

STD TOLERANCES & PRACTICES		
DIMENSIONS	CASTING	MACH
WHOLE NUMBER	±1mm	±0.5mm
DECIMAL 1 PLACE	NOMINAL	±0.1mm
DECIMAL 2&3 PLACES	NOMINAL	±0.04mm
MAXIMUM DRAFT	2°	-
ANGULAR	± 1°	± 30'
INT & EXT RADII	±1mm	±0.5mm
SURFACE FINISH	12.5 µm	1.6µm

IF IN DOUBT ASK DO NOT SCALE OFF DRAWING

TESTING REQUIREMENTS: NONE

PACKAGING REQUIREMENTS: SEE NOTE 1

HEAT TREATMENT: NONE

MATERIAL: SEE PARTS LIST

PROTECTIVE TREATMENT: NONE

GAS STRUTS LOADING ARM BALANCE ASSEMBLIES

LIQUIP SALES PTY. LTD.
13 HUME ROAD SMITHFIELD.N.S.W 2164
Phone (02) 9725-1055 Fax (02) 9609-6459

DRAWN BY	AS
CHECKED	
APPROVED	
ASSY DRWG	NONE
PATTERN No	NONE
SCALE	1:2
DATE DRAWN	14/12/98
PART No	TABLE
A3 DRAWING NO	ISSUE
P3008	B