SAFETY POST & FOUNDATION PUSH TEST EQUIPMENT
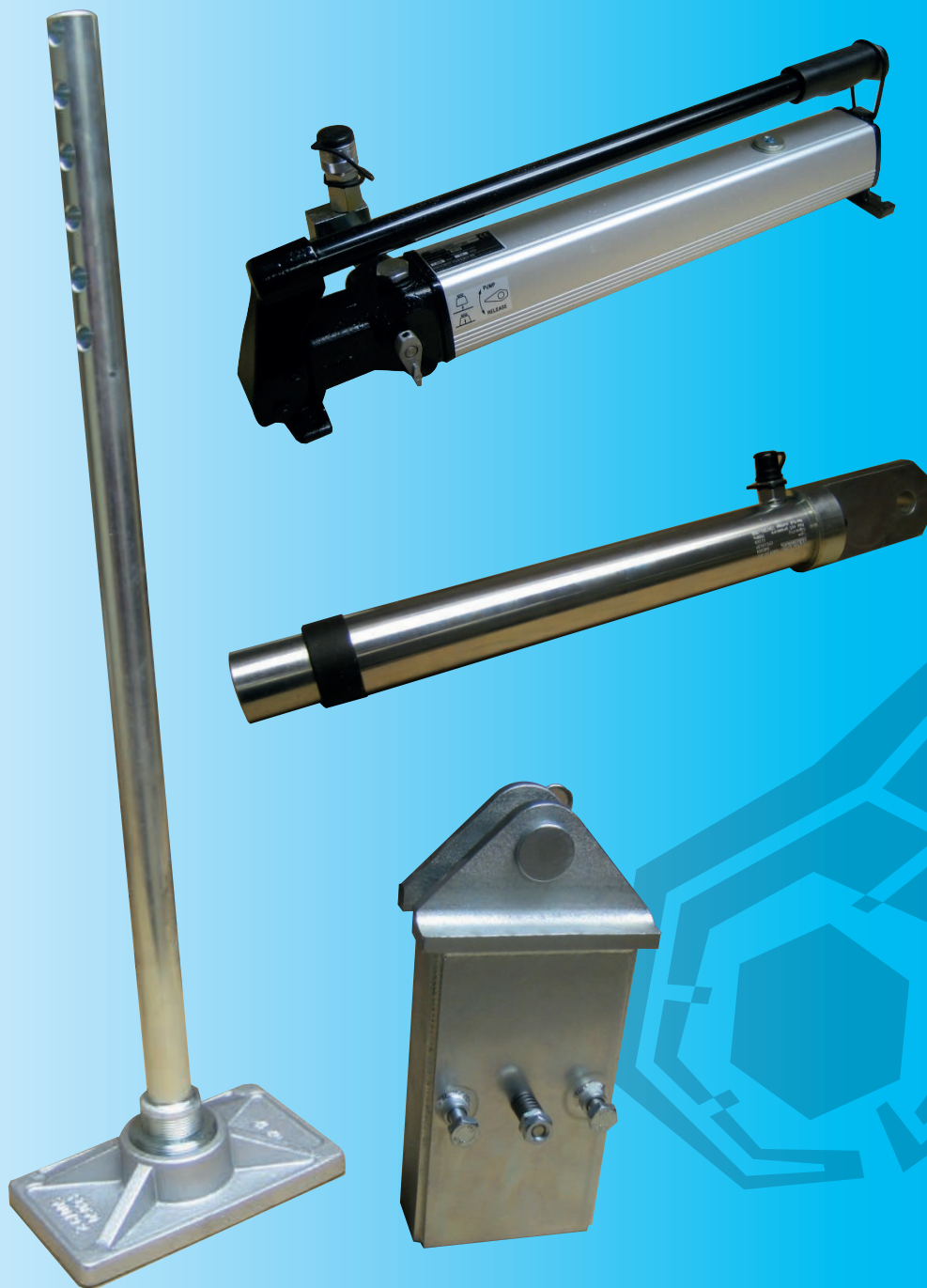
HYDRAJAWS®

The Hydrajaws Safety Post and Foundation Push Tester

The Vehicle Restraint System on a highway must ascertain a required rigidity and maintain it for the whole of its service life.

The Hydrajaws Safety Post and Foundation Push Tester is designed to apply hydraulic pressure on a VRS safety post. This pressure is applied in increments through the use of a hand pump and its attached gauge. The distance between a set vertical datum and the safety post is then recorded at each stage.

When calculated, these recorded measurements will determine whether the post, spacing and footings used are adequate. Using the manufacturer's recommendations, a site engineer will determine the frequency of these tests.

These instructions provide a guide to setting-up, testing and calculating the testing of a typical VRS safety post. For further information please contact Hydrajaws Limited.
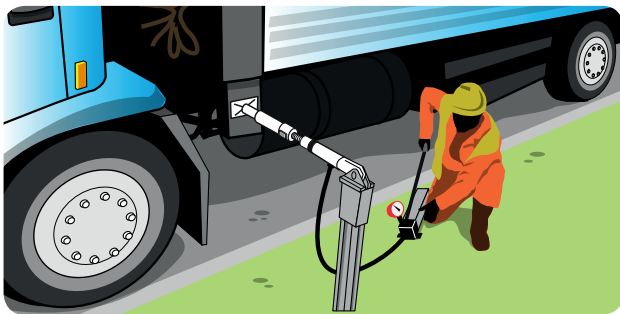
CONTENTS

KIT CONTENTS

Hydraulic assembly for PUSH test kit comprises:

- CFC1012 Push Cylinder,
- 30" Extension Tube,
- Extension leg and base plate,
- Hydraulic Pump,
- Load Gauge and Coupler,
- Calibration certificate,
- Connecting 2mtr Hydraulic Hose,
- Male Coupler,
- Slip Lock Extension,
- Cylinder Top Adaptor,
- Cylinder Base Adaptor,
- Coupler Dust Caps,
- Coupler Dust Plugs,
- Instructions.

Additional accessory
- Wooden box.

USE OF THE TESTER AS DIRECTED

The tester is intended for use by skilled personnel with the appropriate training and knowledge of the applicable safety precautions.

> **It is essential that the operating instructions are read before the tester is operated for the first time.**
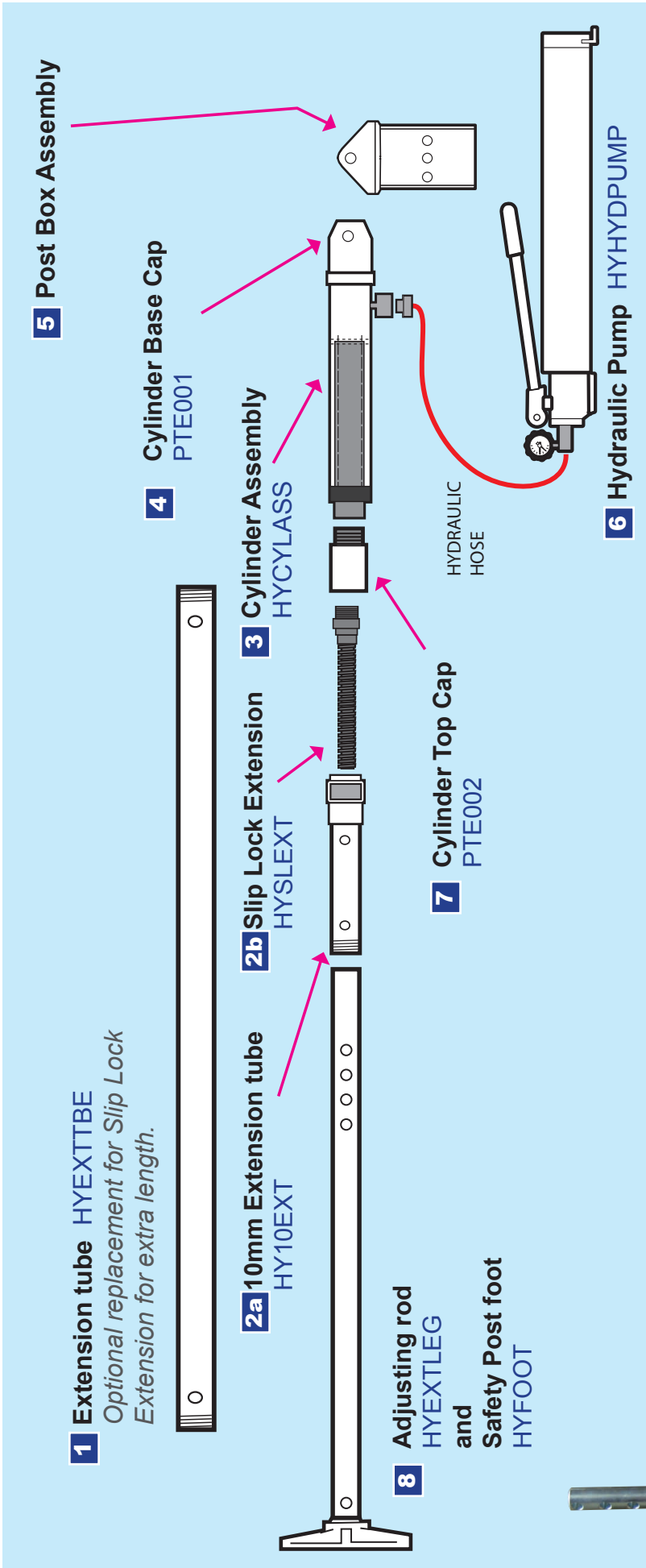>
> **Always keep these operating instructions together with the tester.**
>
> **Ensure that the operating instructions are with the tester when it is given to other persons.**

SAFETY RULES

- Modification of the tester, or tampering with it's parts is not permissible.
- Observe the information printed in the operating instructions applicable to operation care and maintenance.
- The tester and its accessories may present hazards when used incorrectly by untrained personnel or not as directed.
- Use only the genuine Hydrajaws accessories or ancillary equipment listed in the operating instructions.

1 **Extension tube** HYEXTTBE
Optional replacement for Slip Lock Extension for extra length.

2a **10mm Extension tube** HY10EXT

2b **Slip Lock Extension** HYSLEXT

3 **Cylinder Assembly** HYCYLASS

4 **Cylinder Base Cap** PTE001

5 **Post Box Assembly**

6 **Hydraulic Pump** HYHYDPUMP

HYDRAULIC HOSE

7 **Cylinder Top Cap** PTE002

8 **Adjusting rod** HYEXTLEG **and** **Safety Post foot** HYFOOT

POST CAP BOX (OPTIONS):

| PTE100-32 | 100x32 |
PTE110-50	110x50
PTE125-90	125x90
PTE210-60	210x60
PTE130-55	130x55
PTE175-60	175x60

PUSH PROCEDURE

1. Clamp appropriate post box to post (C1)
   - see clamp post section.

2. Attach cylinder to post at clevisend using pin (E1) to secure.

3. Connect hose to pump(Q) and cylinder(B).

4. Connect gauge to gauge adaptor.

5. Screw slip lock extension(F) to the cylinder rod end. Screw long extension tube (H) into the slip lock extension and close the slip lock down to the minimum distance setting. Insert the extension rod(J) with its base plate inside the extension tube (H).

6. Locate the reaction vehicle in a suitable position ensuring the contact point formed between the flat base(M) and the vehicle is perpendicular to the load direction. A suitable timber baulk should be used as shown.

7. Adjust the length between the post and vehicle using the extension rod within the extension tube and locating through the most suitable holes with the locking ball pin. Precise adjustment can be taken up with the slip lock.

8. Switch the valve on the pump to operate the cylinder.

9. Place a vertical Datum (D) adjacent to the post under test, ensuring it is isolated from any foundation movement.

Setup should look similar to fig A (see overview section).

10. Measure within 15mm to the height of loading(L).

11. Measure and mark within 15mm the position on the post where deflection measurement is to be taken.

12. Record distance between the post and the Datum(D).

    Note: A helpful way of doing this would be to attach a laser measuring device to the Datum.

13. Using the hand pump with a smooth and contiuous action apply incremental loads (in steps of 1kN). Record the load and the deflection of the post within 1mm at each increment until one of the conditions below is reached:

    a. A bending moment of 600Nm is achieved (100x32) and (110x50) Z posts.

    b. A bending moment of 900Nm is achieved (125x90) Z post and (150 x 150) timber.

    c. The post deflects 100mm at measuring position for (100x32) and (110x50) Z posts.

    d. The post deflects 150mm at measuring position for (125x90) Z post and (150x150) timber.

14. On completion test and having taken measurements release the valve on the pump to retract the cylinder.
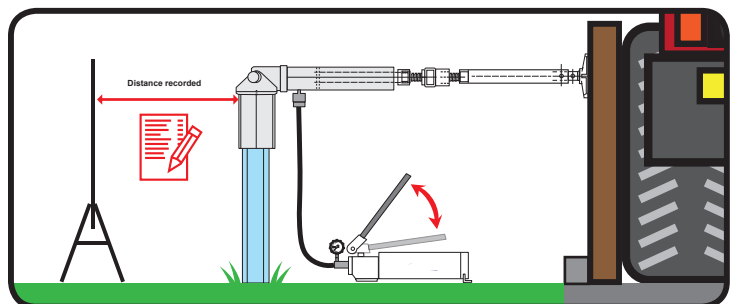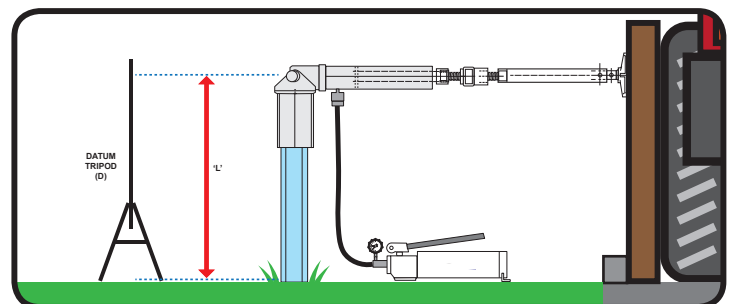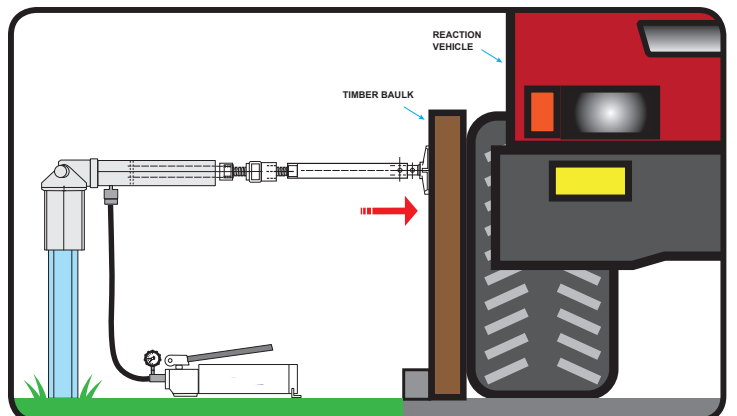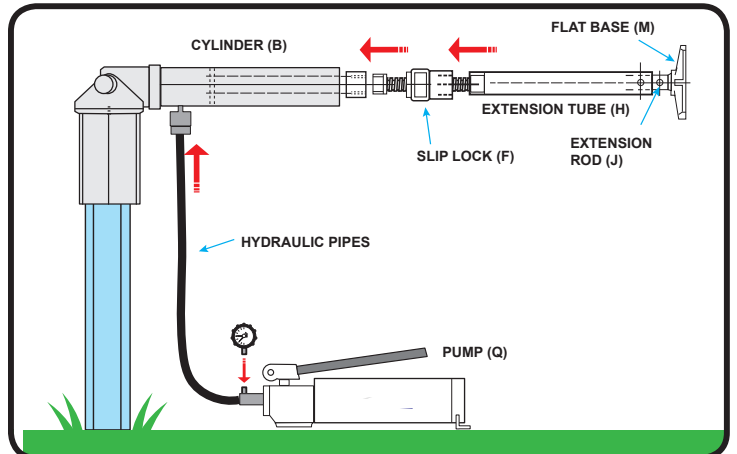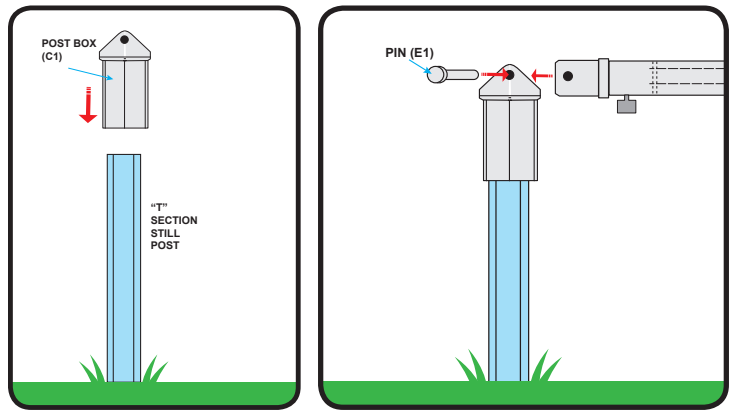
The Clamp Post Set up

1. Ensure correct size post box is used for the size of post to be tested.

2. Unscrew clamping bolts fully.

3. Place Post Box fully over the post to be tested ensuring it is at 90 degrees.

4. TIgnten clamping bolts until post box is secure.

Clamping bolts

Post to be tested

Side section

Post to be tested

Setup Overview

Fig A

TIMBER BAULK

REACTION VEHICLE

FLAT BASE (M)

Extension leg (H)

CYLINDER (B)

Cylinder top adaptor

SLIP LOCK (F)

PIN (E1)

Measure distance (Md)

HYDRAULIC PIPES

DATUM TRIPOD (D)

PUSH LOAD INDICATOR (S1)

Height of loading (L)

POST BOX (C1)

PUMP (Q)

'T' SECTION STILL POST

Y

LOAD DIRECTION

X — X

Y

'Z' SECTION STEEL POSTS
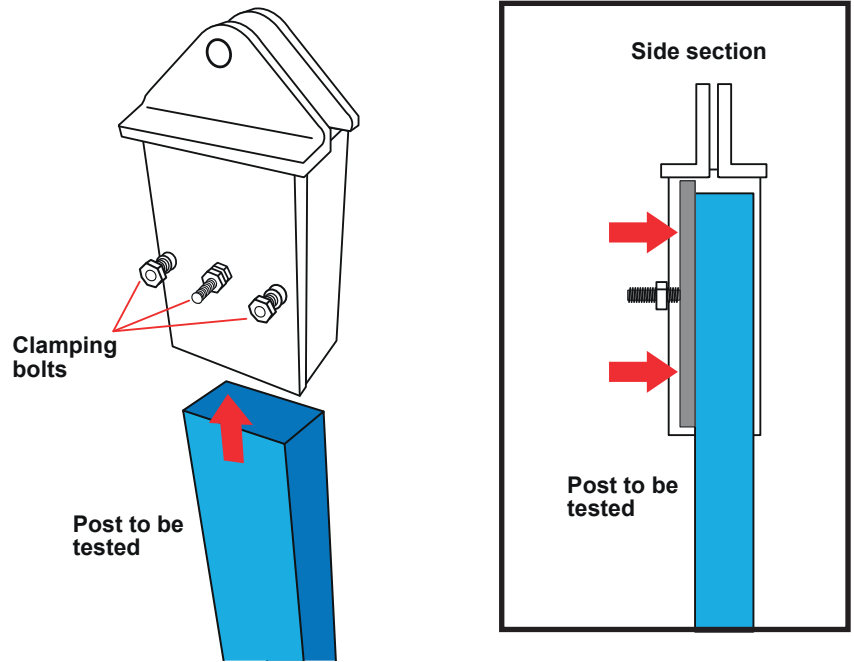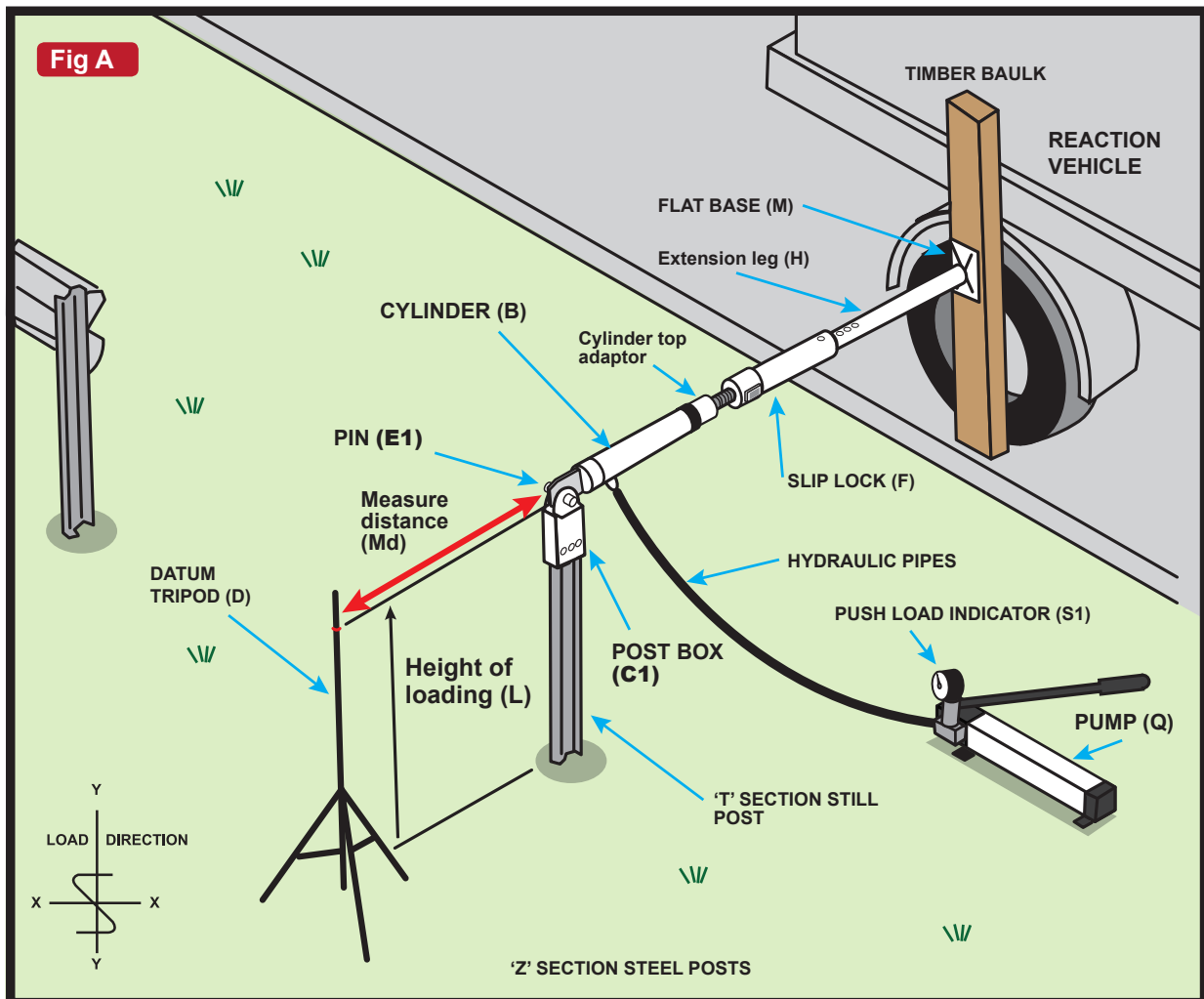
CALCULATIONS

1. Results are to be recorded on the Form PTE/Rev A.

2. The deflection of the post must be measured 600mm above either:

   a) the edge of the *paved surface, if the traffic face of the fence is within 1.5 metres of the edge **(Diagram 1)**, or

   b) the finished ground level or top of the concrete footing, whichever is higher, when the traffic face of the fence is more than 1.5 metres from the edge of the *paved surface **(Diagram 2)**.

3. Bending Moment on the Post/Foundation (BM) = **W x L** where:

   W = Load in Newtons indicated on the load indicator

   L = The height in metres between the point of loading and either:

   a) the edge of the *paved surface, if the traffic face of the fence is within 1.5 metres of the edge, or

   b) the finished ground level or top of the concrete footing, whichever is smaller, when the traffic face of the fence is more than 1.5 metres from the edge of the *paved surface.

4. The post foundation is acceptable if a BM of 6000Nm is achieved without the deflection exceeding 100mm. For (100x32) and (110 x 50) steel posts, and:

   A BM of 9000Nm is achieved without the deflection exceeding 150mm on (125 x 90) steel and (150 x 150) timber.

   * Paved surface is defined as that which comprises carriageway and hard shoulder / hard strips.

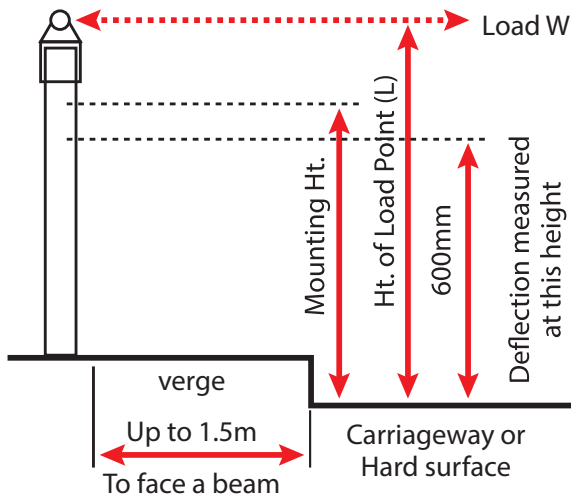## VEHICLE RESTRAINT SYSTEMS (ENGINEERS MODULE)

Diagram 1

Diagram 2
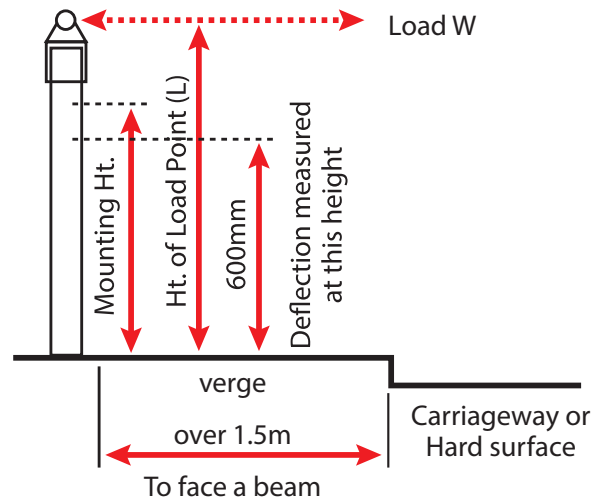
W = Load in ram (push) in Newtons

L = Height of load point in Metres (See above)

Bending Moment (BM) = L x W

Load to be applied by ram = $\dfrac{\text{BM (Nm)}}{\text{L (metres)}}$ Newtons

For TCB/OBB/WR the BM = 6000Nm

For UCB & DROBB the BM = 9000Nm

Max deflection permitted at full Bending Moment = 100mm

All loads to be applied horizontally and perpendicular to axis of post.

All test to be done in accordance with the Highways Agency Interim Requirements for Road Restraint Systems and the Non-Proprietary Safety Barrier System Drawings.

Gauges for ram may read in either Newtons or kilo Newtons (1KN = 1000N).

VEHICLE SAFETY FENCE POST FOUNDATION TEST RESULTS

Date: .... Site: ....

Job No. ....

Order No. .... *=Delete as appropriate

Test No. Details of Post	Push/ Pull *	Load (N)	Offset (mm)	Remarks
Type of Post:		0		
Size of Post		1000		
		2000		
Set Back:		3000		
Max BM - 6000Nm or 9000Nm *		4000		
		5000		
Ht to load point (L): metres		6000		
Max Load required (BM/L): N		7000		
		8000		
Location		9000		Max. Deflection
		10000		

Test No. Details of Post	Push/ Pull *	Load (N)	Offset (mm)	Remarks
Type of Post:		0		
Size of Post		1000		
		2000		
Set Back:		3000		
Max BM - 6000Nm or 9000Nm *		4000		
		5000		
Ht to load point (L): metres		6000		
Max Load required (BM/L): N		7000		
		8000		
Location		9000		Max. Deflection
		10000		

Test No. Details of Post	Push/ Pull *	Load (N)	Offset (mm)	Remarks
Type of Post:		0		
Size of Post		1000		
		2000		
Set Back:		3000		
Max BM - 6000Nm or 9000Nm *		4000		
		5000		
Ht to load point (L): metres		6000		
Max Load required (BM/L): N		7000		
		8000		
Location		9000		Max. Deflection
		10000		

TEST UNDERTAKEN BY: -

(NAME) .... (SIGNATURE) .... DATE................................

Form PTE/Rev A