

HOW STRAIGHT IS YOUR TRACTION ?

PRELIMINARIES

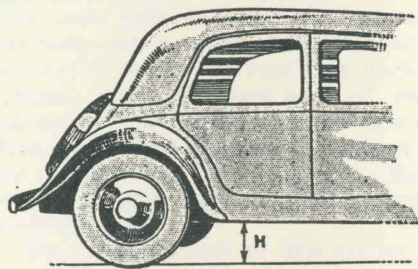
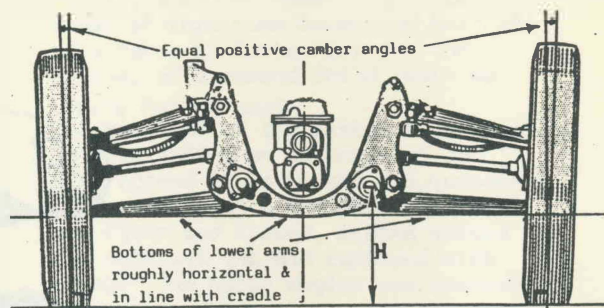
There it lurks in your driveway - the fully restored Traction that you have coveted for months. The erstwhile owner/restorer has departed with your hard-won gold in his hand, and what seems to be a grimace of sorrow on his countenance.

And there you stand, keys and ownership papers in your hand and feeling that the second mortgage on the house was well worthwhile. Ten minutes later, and half a kilometre down the road on your first test run, you're not so sure. You have both hands locked on the steering wheel and one foot firmly braced against the dashboard to hold the device on your side of the road. Perhaps it is the steering - or the tracking - or something. Now you know why it was that you only had to take out a second mortgage on the house and not sell your daughter to the local white slaver to raise the purchase price! The erstwhile owner's hasty departure was not to avoid you seeing his manly facade dissolve into tears at the loss of his beloved Traction, and what you thought was a sorrowful mein was in fact a triumphant grin.

Fear not, all is not lost. In the following series there will be outlined the simple basic checks to ensure that all four wheels co-exist in the correct relationship to each other. And if they do not, where to push, shim or otherwise adjust to ensure that they do. Also how to set up your Traction so that it will proceed down the road without pulling right or left (unless you want it to!). No Claude, you do not need four or even two of the overgrown bathroom scales which the good book says you need to adjust the "weights" (corner weight loadings).

Tractions have a surprisingly rigid hull, and it is most unusual for the hull itself to bend. Not so though for the sponsons (the extensions forward of passenger compartment), and in fact, a "distorted" hull usually is not. It is at the point just forward of the windscreen or rear of the engine bay where the sponsons blend into the hull that any bending does take place. However, shunting curbs, particularly sideways, can upset things considerably. Very frequently, some panel damage may also occur at these times! Don't laugh about the sideways bit. Anyone who has driven a Traction with any verve on a wet road will be aware of the bulk understeer that can cause the front to go straight on, and if you get a little panic-stricken and heavy-footed on the brake pedal at the wrong time, have the tail and thus a rear wheel, fetch up against a curb with a healthy thump. In fact, this latter assault, coupled with clods who jack up the rear of a Traction by placing the jack in the centre of the axle beam, causes 99% of rear axle alignment problems. Consequently, when on the surface all seems well and as it should be, some simple checks may not go astray.

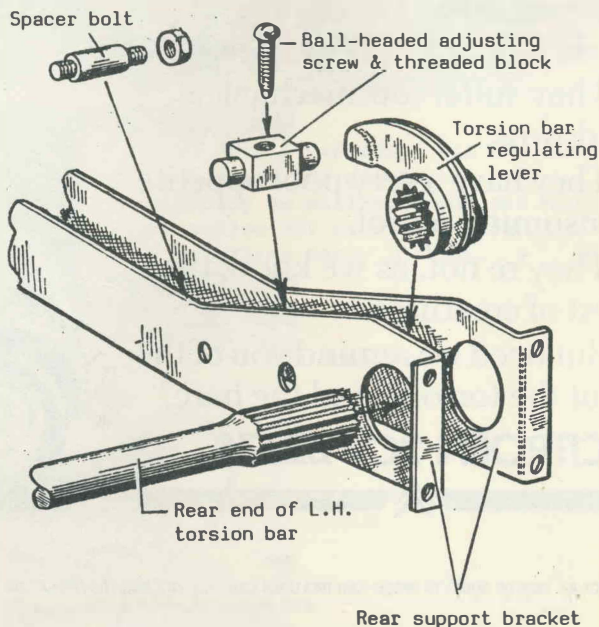
Firstly, a simple visual check. Get the bolide (projectile) onto a level surface, with the front wheels pointing straight ahead. A certain amount of space fore and aft is needed. If your local service station is closed at weekends, its forecourt should be ideal. Go 3-4m in front of the car, get your head well down,



and look at the lower suspension arms. They, and the bottom of the suspension cradle should form an almost straight line, approximately parallel to the ground. The front wheels should be nearly vertical, but with the tops leaning out a little (this is called "positive camber"). Obviously, the wheels should lean out to the same extent on both sides. All seems as it should so far? Great!

Now go to the back of the chariot and have another look from 3-4m away. Is the bottom of the fuel tank and the underneath of the body parallel to the ground? It is? Fine. How about the rear wheels? Are they angled similarly to those at front?

Now for those who want to check the heights fully. With the vehicle on a level surface, the front height is measured from the ground to the centre of the splined silentbloc in each lower arm. The standard height (H) for a given model is shown in the table.



Model English (French)	Tyre (Michelin X)	Height - mm (Tyre pressure - psi)	
		Front	Rear
Twelve (7CV)	155x400	267 (17)	257 (20)
Light 15 (11 Légère)	165x400	275 (18.5)	264 (20)
Big 15 (11 Normale)	165x400	275 (19)	274 (20.5)
Family 15/F9 (Familiale)	185x400	287 (20)	317 (22.5)
Commercial (11 Commerciale)			
Six Cylinder (15-Six)	185x400	275 (20.5)	295 (22.5)
- (15-Six Familiale)	185x400	275 (22.5)	313 (24)
- (15-Six H)	165x400	251 (22)	277 (24)
Six H** (-) *	185x400	261 (20.5)	287 (22.5)

These are recommended minimum heights. Front height can be +5 mm, rear height can be +10 mm. Obviously, set both sides the same height.

Aim to retain same rolling radius if non-standard tyres/rims fitted. If this is not so, alter the indicated total suspension heights (above) so as to retain suspension geometry i.e. suspension arm angles etc.

* Rear suspension in "Route" position.

** English hydraulic Sixes were fitted with 185x400 tyres - heights quoted are based on retention of suspension geometry i.e. whole car is lifted by an amount equal to the increase in rolling radius of the larger tyres.

Tyre pressures may be altered after setting heights so as to achieve desired combination of ride and handling.

Adjustment is made in a manner similar to that involved in adjusting tappets. A vertical ball-headed adjusting screw bears upwards against the end of a short regulating lever splined onto the rear end of each front torsion bar. The adjusting screw is screwed in (upwards) to raise that side of the vehicle, out (downwards) to lower that side.

Note: (a) There are no locknuts on the adjusting screws

- (b) A special tool is advised but not essential.
- (c) Jack the car under the front cradle to take the load off the torsion bar before attempting any adjustment.
- (d) After each adjustment, lower car to ground and bounce it up and down vig-
orously to ensure everything is in its working position before checking measurement etc.

Jack Johansen.

(To be continued)



Continued from Front Drive 9 (4), p4.

Pending completion of the next section of notes on checking the alignment of your Traction, you might care to consider what is involved in straightening the body.

STRAIGHTENING THE BODY

In the preliminary notes in this series on checking and straightening your Traction, we observed that the Traction hull is basically a stiff structure, not normally damaged in itself. However, the protruding sponsons which carry the power unit and front suspension are more liable to be distorted in a collision. Further, a surprising number of Traction's have been damaged from having a shunt in the rear at some time, perhaps because their brakes are so good.

Both types of impact are likely to produce some form of foreshortening, and in the likely event that the impact was not dead centre at front or rear, assymetric or "diamond-like" distortion of the wheelbase.

In earlier times, when the Traction was a current model, it was relatively easy to obtain replacement body sections which could be let in to replace the damaged area. It may still be possible to cannabalise a discarded body for pieces, but often this is not feasible. Thus one must resort to returning the existing body as an entirety to its original shape and alignment.

The Traction Body Manual shows how some of the various forms of distortion of the hull can be rectified, using a threaded body makers' jack to push between various points on the hull (Figure 8).

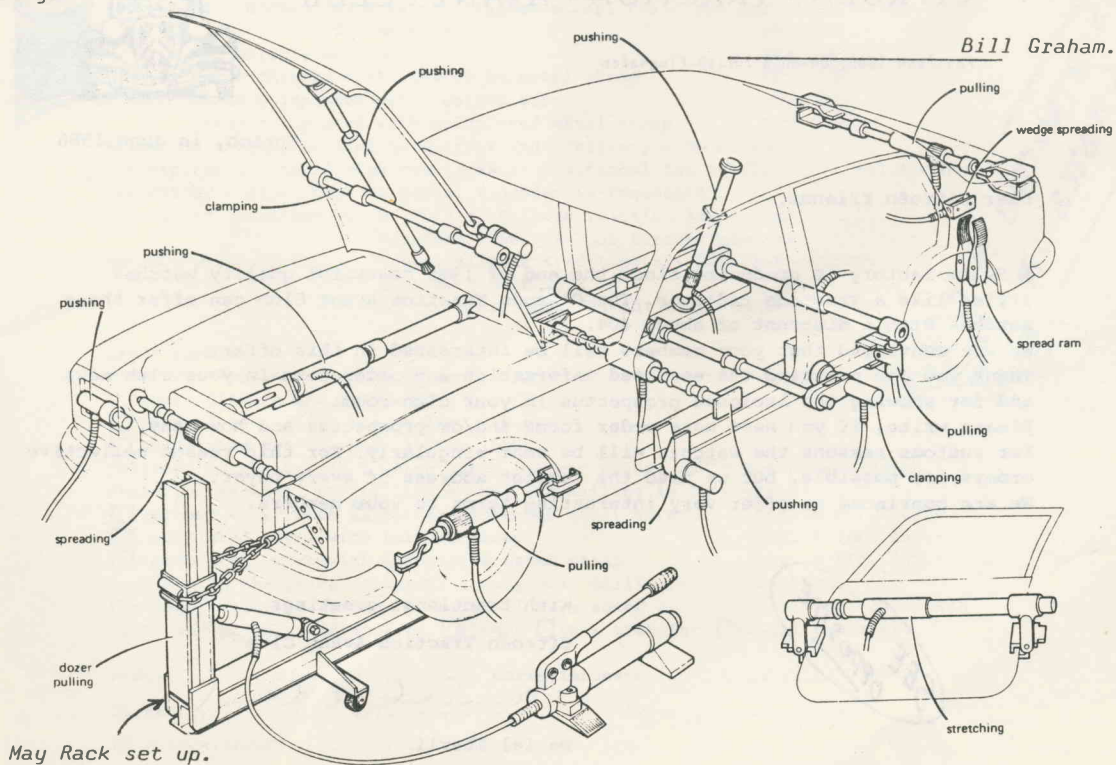
Fig. 3: Porto-Power equipment applied to modern body.

The simple, versatile equipment to do this sort of work is now called a Porto-Power. This is a refinement of earlier attempts to use ordinary ratchet, screw and hydraulic lifting jacks for body repairs. Such set-ups usually had significant disadvantages and where possible, the Porto-Power is easier to use and handle. Basically, the Porto-Power consists of a hydraulic pump unit (reservoir, pump, handle, flexible hose, release valve), a ram or rams, and various end-fittings and attachments (flex-heads, bases, extender-tubes, clamps, wedges etc.).

By the use of double-acting cylinders or adaptors on push-type rams (including the more massive dozer-type unit), it is possible to pull rather than push body pieces into the correct places. Various ways in which the Porto-power equipment is applied to a modern unitary-construction body is shown in Figure 3.

Fundamental to the use of Porto-Power equipment is the location of suitable jacking or anchorage points from which to push or pull. With a bit of knowledge and experience, it is possible to identify strong enough jacking points in the Traction hull to enable major misalignments of the body to be rectified. For misalignments of the front and rear of the body as mentioned above, the fundamental jacking point is the tubular member which carries the rear suspension (Figure 7).

While it may be possible to hire or borrow a Porto-Power unit and attachments when you are straightening your Traction, the facts are that your time is likely to be broken up (week-ends etc), and that being a "one-off" job for you, the job could be a bit protracted. Hence, it may be preferable to conserve your hiring dollars or borrowing friendships and knock up your own device. For the front or rear straightening we have in mind, this is entirely feasible.



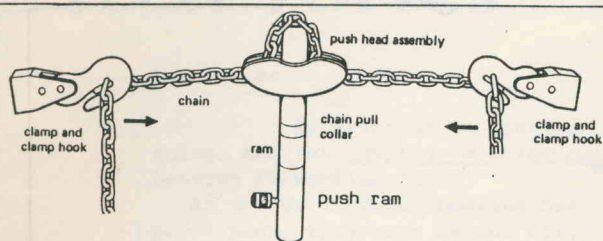


Fig. 4: Chain-pull adapter for push ram.

Now having read with interest the fore-going, and looked with horror at Figure 3 which shows a Port-Power of the Black Hawk type, with all attachments, one could pensively enquire how we are going to duplicate all this equipment. Simple, you aren't! - see Figure 6. For our purposes, all that is required are simple push type operations in a basically horizontal plane.

Ha, ha, you say. We've got him there - a hydraulic jack won't work on its side. Well, it will, provided the inlet to the pump is below the fluid level. So if it is used with the pump underneath, the only problem can be the operation of the pump handle when in certain locations in the car. However, a little thought will always overcome that problem.

A cheap hydraulic bottle-jack of 1-1½ tonne capacity forms the basis of the device. A piece of steel plate of ¼ inch (6 mm) or greater thick, cut to the same size as the jack base and bolted to it with 4 high tensile bolts of approximately ½" diameter, preferably via holes drilled in each corner of the jack base and the steel plate. Don't be too concerned if the presence of the jack's pump prevents drilling of the fourth hole (refer to Figure 6).

A 1½ inch (36 mm) steam socket (black, ungalvanised) is now welded to the steel base plate at the centreline of the jack's ram (i.e. directly below the ram). To avoid cooking the jack, the welding should be done with the baseplate detached from the jack.

Then obtain (even purchase from your local plumbing supplier) a few heavy-walled 1½ inch nipples (a nipple is a short length of pipe threaded at both ends). These can be obtained in a variety of lengths. Use heavy-walled pipe or nipples for all extensions and steam sockets for all joints. Remember there can be quite a lot of compressional force built up in the device and thin-walled tube can compression bend unexpectedly. This rather defeats the pushing process.

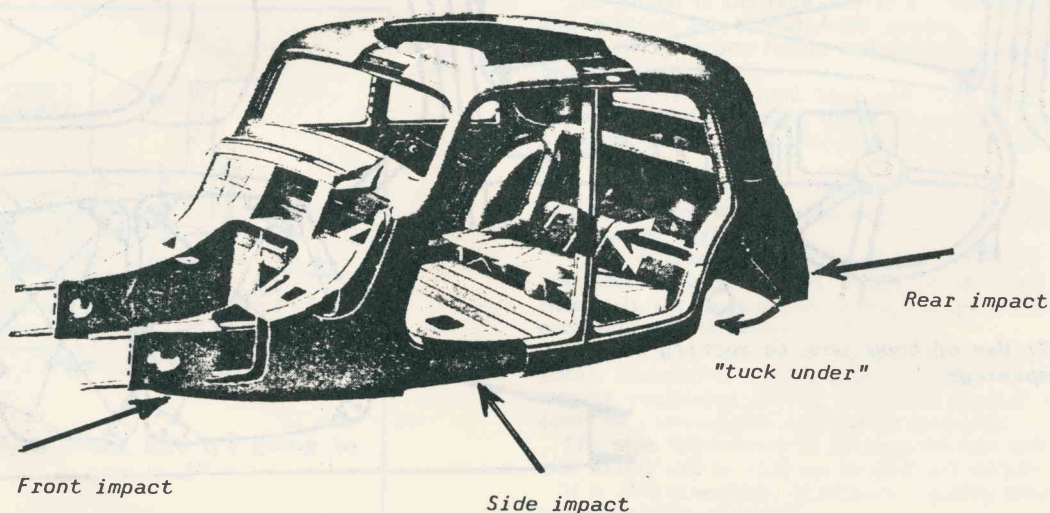
Put the push pad of the jack ram against one surface and the heavy-walled pipe against the other and simply pump. Do not try extending the ram with pipe or you may develop some strange bends in the ram. Keep the number of joints to a minimum in the extension. It is better to employ two 500 mm nipples than six of 170 mm. Use a block of hardwood at either end of your device where the pressure is being applied to thin metal to avoid unwanted dimpling. Remember, the place you push from must be as solid and immovable as possible. Otherwise, in trying to correct one problem, you may produce another.

It may be as you swing mightily on the jack handle, trying to get the last mm of movement, the jack starts to bypass internally. This problem can frequently be overcome by draining and refilling the jack with 20-50 multi-grade oil - with cheaper jacks, it might be better to do this before you start.

Jack Johansen Weaver.

(To be continued).

Fig. 5: Traction body shell showing:
Rear impact with compression and "tuck-under".
Front impact with compression and distortion.
Side impact with collapse inwards.



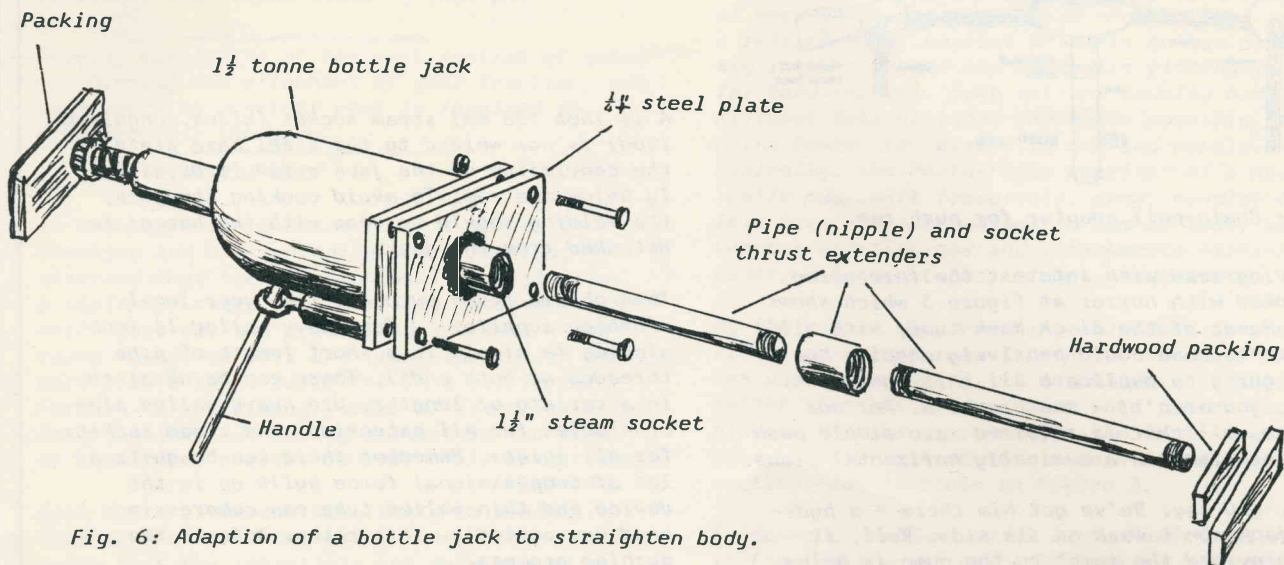


Fig. 6: Adaption of a bottle jack to straighten body.

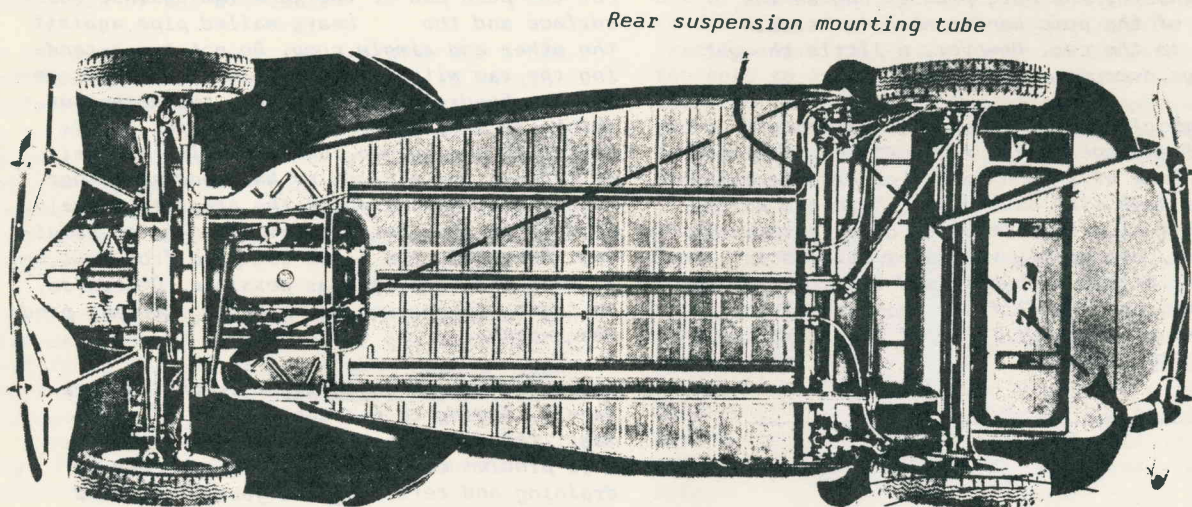


Fig. 7: Underside of Traction body showing rear suspension mounting tube as thrust anchor.

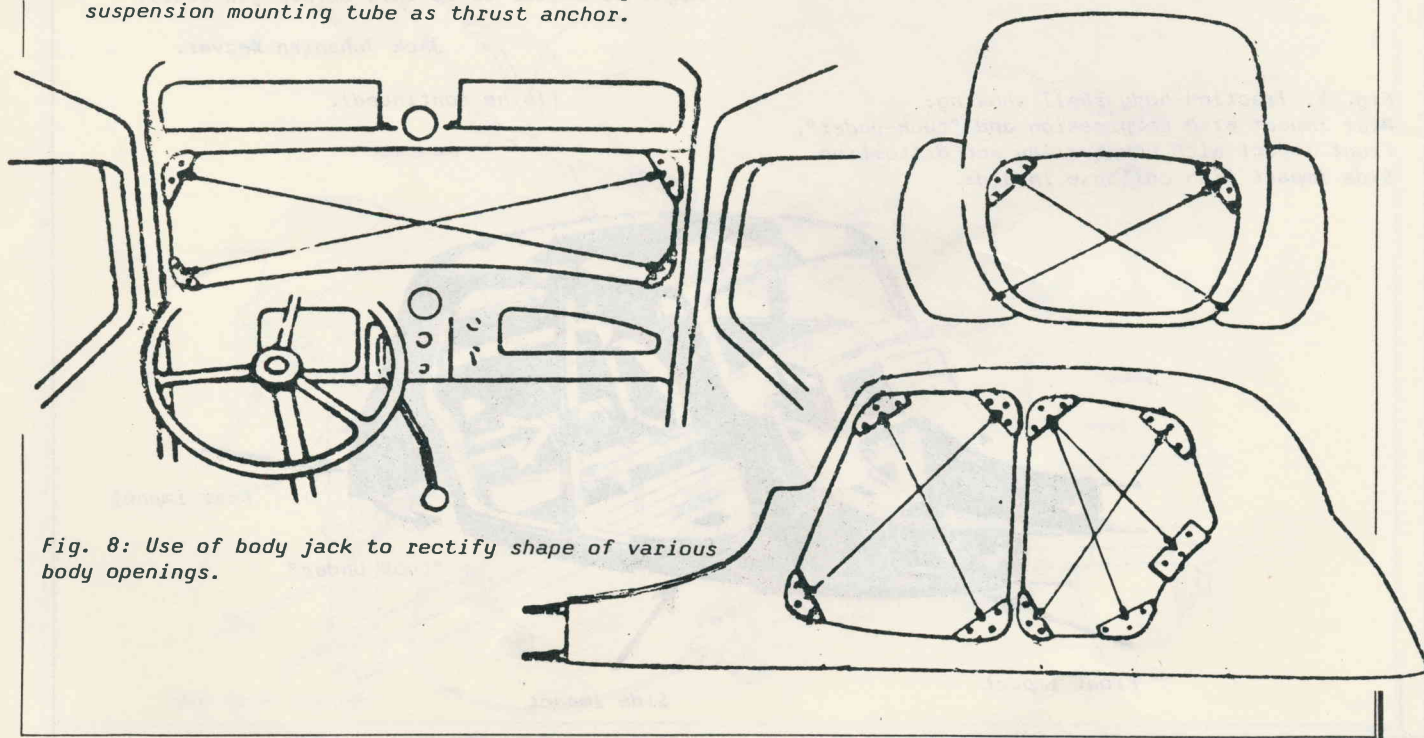


Fig. 8: Use of body jack to rectify shape of various body openings.

HOW STRAIGHT IS YOUR TRACTION ?



TECH TOPICS

STRAIGHTENING A REAR-END SHUNT

Following on from Jack Weaver's note on making up and using a home-made hydraulic body jack (FD 10 (3) Sept/Oct 1986), two of our members, Hayden Chapman and Ron Lawrence, faced up to the shunt which their Light 15 seemed to have suffered at some time in its history. Checking with previous owner, John Brookes, revealed that someone "had gone up the back of him." We noted earlier that such impacts are not uncommon with Traction's.

The main immediate evidence of the impact was that both rear doors didn't close properly, the rear edges of the doors overlapping the body openings by up to 5 mm in places. There was also some inward denting of the sill panel beneath the left-hand door opening, and a "bit of bog" in a scar in the left-hand rear quarter panel at about window sill level. The floor beneath the rear seat and the boot floor were also buckled, and there was "rippling" of the inner wheel arches.

Hayden and Ron had a talk with Jack to get specific advice on their problem, and then proceeded as below.

They jacked up the rear of the car and set it up securely on axle stands. The petrol tank, wheels, and exhaust were removed. A piece of hardwood, about 5" x 5" (125x125 mm) was fitted across the pressing which forms the rear of the recess which takes the petrol tank. A heavy bottle jack was to hand, together with a length of three inch (75 mm) heavy water pipe.

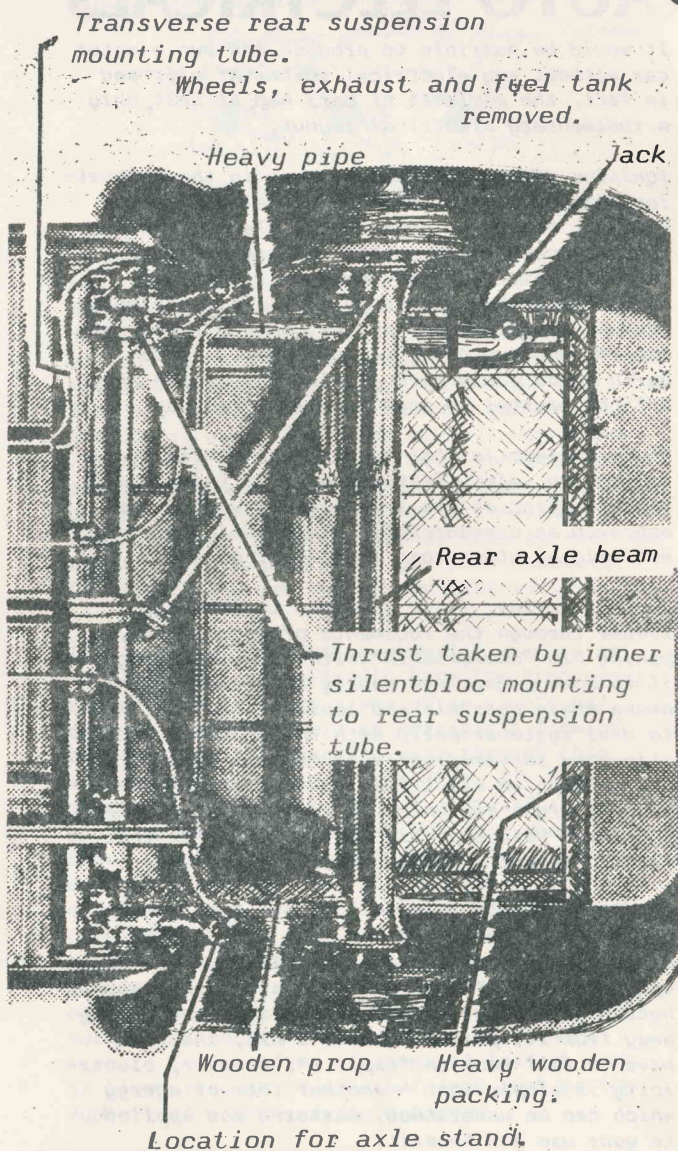
The pipe was cut so that it would fit between the heavy fittings which take the outer ends of the rear torsion bars, and the base of the jack. The "front" end of the piece of pipe was shaped to fit securely onto the bracket through which the fore-and-aft thrust of the jack would be transferred to the transverse rear suspension mounting tube (see previous note). The extending column of the jack was set to bear on the wooden packing piece.

When pushing on one side, there is the risk that the rear of the car will "see-saw" about its centre line. To avoid this happening, a wooden prop was placed between the torsion bar mounting and the wooden packing on the side opposite the jack. In practice, this spacer did not seem necessary in this case, probably because of the way the metal had deformed.

Because of the large diameter of the piece of pipe, it was not found essential to bolt it to the base of the jack, although the jack would spring out if it was not aligned properly.

Jacking then proceeded, first one side, then the other, until the panelling and body openings were restored to correct shape. Some comparative measurements from a straight body or part thereof would help to establish when to stop pushing. In this case, the fit of the doors was a reference.

Pushing was performed without lying under the car. Initially, it was found that pushes of up to 15 mm would just spring back, but as confid-



ence rose, bigger movements were achieved and the panelling was finally "reformed" back to its proper position. Personally, I think that some judicious hammering (against a dolly where feasible) would help in reforming the metal when it is under tension from the jack. This would also minimize tearing of welds. Some re-welding may be necessary.

One side of the car has come out perfectly. The other side is fine also except for the dent below the door. Attempts to raise this by repeated use of a screw-in impact puller failed because the screw end wouldn't hold in the panel. It will probably be raised by brazing* a temporary bracket into the centre of the depression and hauling on this.

The assessment of the job by our now-experienced body-shapers? Very successful and "not very hard to do", says Hayden.

Perhaps this will encourage other members to attack their body straightening problems with some confidence. Please let us know of your experiences.

(To be continued)

Bill Graham.

*Technically, "bronze welding".