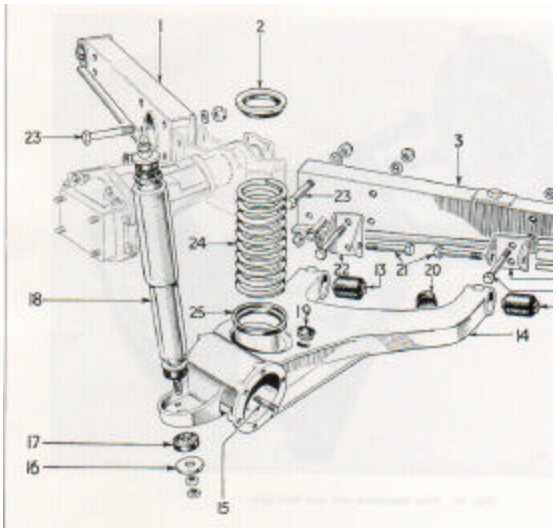
SHOCK ABSORBERS

By Syd Gallagher

Fault Identification and
Method of Replacing Defective Rear Shock absorbers

Triumph Saloon & Estate
2000 - 2.5PI
2000Mk 2 – 2500PI – 2000TC - 2500TC – 2500S



Comments relate to all six cylinder saloons and estates.

WHAT DOES THE SHOCK ABSORBER DO?

The shock absorber – or spring damper – is a sealed cylindrical structure containing either oil or gas. On our cars, the shock absorber is a telescopic or "direct action" strut. Any deflection of the telescope causes a piston to move in the oil/gas filled cylinder with a defined rate of leak, thus allowing friction in the system and a "dampening" of the spring's natural tendency to oscillate.

Note that a coil spring, such as fitted to the rear of our cars, once activated or stretched, will continue to bounce up and down for a considerable time unless controlled.

The primary function of the shock absorber is to;

1. Act as an effective friction "damper" to prevent uncontrolled oscillation of the coil spring. A moving car mounted on coil springs will continue to bounce up and down after striking a bump if there is no "dampening device".

In addition, the telescoping shock absorber also;

2. Acts as an effective tether between the vehicle body and the rearmost portion of the trailing arm independent suspension unit, effectively limiting downward separation between the vehicle body and the suspension trailing arms.
3. Allows secure location of the coil spring which is not in any other way fixed in the vehicle (other than by body weight);
4. Offers resistance to body roll;
5. May contribute to the sideways location of the rear axle.

Early cars with leaf or "cart springs" did not have an equivalent of the modern shock absorber, leather or abrasive discs captured in housings capable of adjustment, titled "friction dampers" were fitted. Friction allowed the natural oscillation of the spring to be controlled or "dampened out". Adjustment would allow compensation for a softer or firmer ride.

Early leaf springs offered friction between the loosely captive leaves, sufficient to dampen the bounce. The spring – either coil or leaf – actually absorbs the initial shock of the bump, the damper serving to prevent further oscillation.

IDENTIFY THE FAULT

In a moving vehicle in the 2000/2500 range, shock absorber (damper) failure can be identified by;

6. Uncontrolled bounce of the rear of the vehicle-no "dampening" effect;
7. Unequal ride height;
8. Harsh pitching.
9. In rare cases, splaying of the rear wheels.

However, splaying of the rear wheels and a lowered body height may not be indicative of damper failure. Rather this could point to a failure of the coil spring, a loss of spring height through wear, loss of temper or breakage or, in extreme cases, failure of suspension arm mounting bushes.

HOW DO WE REPLACE SHOCK ABSORBERS?

Replacement of shock absorbers in the Triumph range is a relatively straightforward operation, confident Saturday mechanics following instructions should be able to tackle this job in under two hours.

In essence, you are going to lift the rear of the vehicle sufficiently to allow the rear suspension to hang freely.

SHOCK ABSORBERS MUST BE REPLACED IN MATCHED PAIRS.

You will need:

- A help-mate;
- Vehicle stands (2);
- Trolley jack capable of lifting the vehicle sufficiently to allow secure placement of the stands under the rear jacking points;
- Appropriate sized tools - ring spanners, socket and ratchet handle, wheel brace;
- Dry, level hardstanding.

STEP 1

After having identified the shock absorber failure, purchase new shock absorbers. Telescopic dampers are not serviceable and must be replaced in pairs. Modern shock absorbers are gas filled. A pair of suitable shock absorbers will retail for abound the $140 mark.

You will notice the correct damper is threaded each end and will be delivered with new rubber mounting bushes, washers and Nyloc style nuts. You do not need to "prime" modern replacements, the damper will be delivered boxed and in a contracted state, ie. the lowest overall height. A heavy wire clip will be present; this should be left in place until the unit is mounted in the vehicle. Lay out the new dampers, tools to fit the securing nuts and wheel brace.

STEP 2

You are going to raise the vehicle sufficiently to remove both rear road wheels. Chock the vehicle front wheels securely to prevent forward movement. Vehicle should be in neutral with the handbrake "OFF". Approaching the vehicle from the rear, place a trolley jack with a suitable timber "buffer" securely under the differential. Raise the jack until the body just commences to rise. Remove any wheel trims and proceed to loosen the wheel nuts a half-turn.

At this point is it essential to remember that if you suspect a broken shock absorber, dot points 2 + 3 will be a concern in that you will be unable to control the drop of the swinging arm with a possible ejection of the unsecured spring. Professional or more experience help should be sought before proceeding.

Raise the vehicle sufficiently to allow placement of stands under the rear jacking points, you will need sufficient room to remove the road wheel. Place the stands under the jacking point, a good idea is to prepare two identical wooden blocks with holes to accommodate the jacking point pin, secure these to the jacking point, raise the stands to allow minimum "drop" when lowering the vehicle onto the stands.

Always lower the jack slowly to allow the body weight to sit on the stands, check that the vehicle is sitting square and secure before removing the jack completely.

NEVER ATTEMPT ANY WORK UNDER THE VEHICLE RAISED ONLY ON THE JACK, DO NOT USE TIMBER, BRICKS OR OTHER MATERIAL AS VEHICLE STANDS.

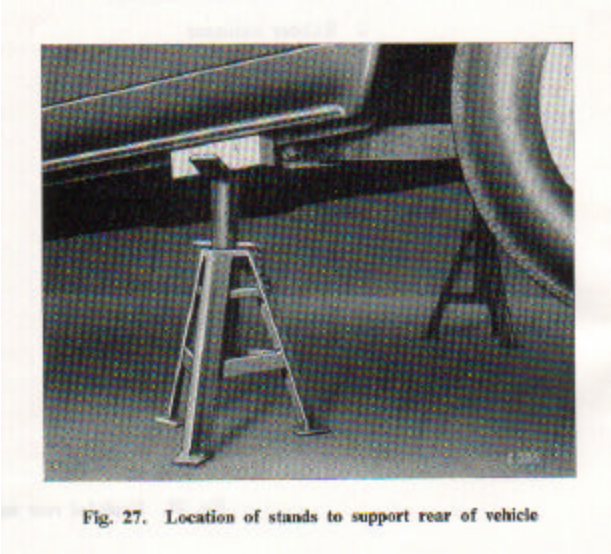


Fig. 27. Location of stands to support rear of vehicle

Remove the jack, you are going to need it shortly.

Remove the road wheels; store clear of the worksite.

You will now observe that the rear suspension is hanging free, THE SHOCK ABSORBER SECURED TO THE BODY OF THE VEHICLE AND THE REAR OF THE TRAILING ARM, PREVENTS THE SPRING BEING EJECTED.

STEP 3

Place the jack with a suitable timber buffer under the rear of the nearside trailing arm. You are about to raise the trailing arm with the jack and will compress the road spring and the shock absorber. You will also need to work on the shock absorber mountings, so ensure the placing of the jack does not interfere with access to nuts.

Raise the trailing arm carefully, compressing both spring and damper, **CAUTION**, watch the body of the car, if the body starts to lift from the stands, you have compressed the spring and damper further than necessary, release the load on the jack until the vehicle is secure on the stands.

This time you will be permitted to work in the vicinity of the jack. Working from inside the boot, remove the securing nut at the top of the damper where the fitting protrudes through the inboard side of the wheel arch. The same process is adopted in the estate. Working with the tailgate open, raise the small carpet flap on the inboard side of the wheel arch. You will need an

appropriate socket and handle here as the damper mounting nut is recessed. Once the nut is removed, return to the jack.

STEP 4

CAUTION: You are about to lower the jack, the damper is free from the upper mount and will remain compressed. One the trailing arm is lowered the spring will be free. It is unlikely that the spring will be ejected with any force, **unlikely but possible**, so approach this point with caution.

Have your helpmate securely hold the spring, very slowly lower the jack allowing the trailing arm to drop. The upper part of the damper will release from the wheel arch; the coil spring will release from its upper locating position together with a rubber mounting ring. As soon as the spring is free and controlled by your helpmate, remove it from the vehicle and stop any further downward movement of the trailing arm. Remove the damper lower locating nut from below the damper-mounting cup and withdraw the damper. There is now an opportunity to clean the damper and spring mounts.

STEP 5

Refreshment break, cup of tea or coffee.

STEP 6

You are about to install the new damper and replace the coil spring. Set out the damper, new rubber bushes, washers and nuts. Place washers and rubber bushes in accordance with the drawing on page 1. Locate the damper lower thread into the trailing arm, complete with bushes. Below the trailing arm, mate rubber bush and metal washer on the damper mounting thread which will protrude through the mounting hole. See the photograph on page 1 if in doubt. Place nut on the thread and tighten until secure. At this point, carefully remove the retaining wire on the damper, it will remain in a compressed state, so extend the damper by hand to enable ease of location in the upper mounting on the wheel arch.

STEP 7

Place the coil spring and rubber mounting into the mount on the trailing arm. **CAUTION:** You are going to operate the jack to raise the trailing arm, damper and spring. At the same time, your helpmate will be ready to position the coil spring and rubber mount in the upper mounting on the vehicle body and ensure a clear passage for the damper upper mounting thread through the mounting hole in the wheel arch.

Operate the jack slowly and deliberately until the trailing arm compresses the coil spring and the damper upper mounting thread is located in the wheel arch.

CATUTION: Beware of hand and finger pinch points.

Operate the jack until sufficient thread to complete the upper damper mounting process appears. Ensure that the coil spring is correctly seated in its mounting under the body. Secure the damper upper mounting with rubber bush, metal washer and Nyloc nut. Check damper lower mounting nut is secure. You will notice that each end of the damper mounting threads has small flats either side, this is to allow the use of a small spanner to hold the thread secure whilst the nut is tightened.

Once the damper and coil springs are seen to be secure, you may carefully lower the jack. Replace the road wheel.

Clean the worksite, account for tools and repeat the operation on the offside of the vehicle.

Once complete, raise the vehicle centrally, remove stands and lower to the ground. Tighten wheel nuts. Replace wheel trims.

STEP 8

Road test the vehicle, you should notice an immediate and substantial improvement in ride quality, well worth the reasonable outlay and the knowledge that you **DIY!**

Case Study.

PROBLEM. My 2000Mk 2 Estate rapidly developed a very uncomfortable "pitching" in normal use, the ride was affected and was confined to one side of the car. I identified that a damaged damper was probably the cause as the impression was that the coil spring was being prevented from doing its job.

The vehicle was raised on a jack preparatory to replacement of the dampers. With the vehicle raised and the suspension hanging, the off-side road wheel and trailing arm was found to be about two to three inches higher than the nearside.
CAUSE: The offside damper had failed, was seized and was not allowing full range dampening effect.

Before you commence this operation, undertake a RISK ASSESSMENT.

- **Do I have the confidence to tackle the job?**
- **Do I have the worksite?**
- **Do I have the tools?**
- **Do I have the helpmate?**
- **DO I HAVE THE CONFIDENCE?**

If the answer is **NO,** have a professional or more experienced club members assist you – **That's what being in the TCCV is all about!**