

VW **m** MOTORING

DIY

POWER TRIP!

Not everyone has biceps like Arnie and many mere mortals find the steering on the first generation of Golfs (plus Sciroccos and Jettas) to be a bit on the heavy side. Happily, there is a solution: Lindsay Porter reports on what's involved in fitting a TSR power-steering kit to a Mk 1 Golf Cabrio.



TSR PAS KIT

These are the components supplied by TSR Performance. It is a completely comprehensive kit of parts and includes the RHD PAS rack, the pump, and all relevant brackets right down to the last nut and spring washer.



CONTACTS

TSR Performance, 1 Stockmore Park, Taunton Road, Bridgwater, Somerset, TA6 6LD

Tel: 01278 453 036
Website: www.tsrperformance.com

VERDICT

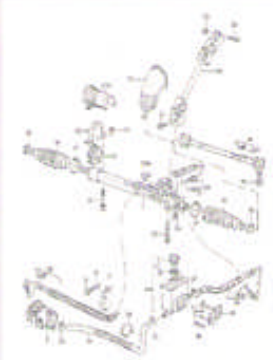
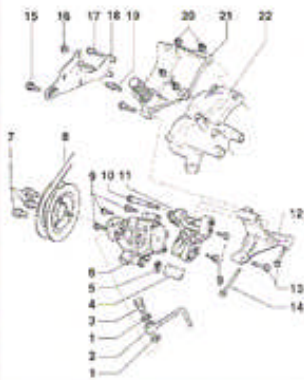
On the road, the TSR Performance power steering kit completely changes some aspects of the car's driving character. For a start, the steering is faster and feels more precise. And with a smaller steering wheel - which it's now possible to fit without over-straining the

biceps - the steering has a tremendously sporty feel to it. Best of all, it is now pleasantly light at parking speeds so it's no longer difficult to turn the 'wheel with one hand when you're looking over your shoulder and reversing into a tight parking space.

OVERVIEW OF THE GOLF POWER-STEERING SYSTEM

MK 2 GOLF PAS

This is the layout of the PAS systems on a Mk 2 Golf. The principles of the arrangement are the same as for the system fitted here. The relevant components are: power steering pump; low-pressure fluid hose; high-



pressure fluid hose (different at the rack end because of TSR's use of a non-Volkswagen rack, there not being a RHD Volkswagen power rack); fluid reservoir; reservoir mounting bracket; fluid return pipe.

THE GOLF Mk 1 was never fitted with power steering by Volkswagen on right-hand drive models, although you can find left-hand drive vehicles with PAS, as it was fitted to later vehicles, mainly for the American market. So the first and most obvious way of converting a Golf / Scirocco / Jetta to power steering, by retro-fitting the manufacturer's product, is not available.

The next logical possibility would be to fit the PAS system from a Mk 2 model. However, the way in which the rack is fitted to the vehicle would make this extremely difficult (the 'rack is bolted to the subframe, rather than the bulkhead). As a result of

this, TSR Performance have produced a power steering kit specially for Mk 1 Golfs utilising many original Volkswagen parts, but with a power steering rack and fixing kit developed in-house.

They use items such as the power steering pump, mountings and other ancillaries from the Volkswagen range (in fact, from the Mk 2 Golf) and these bolt directly to the Mk 1's engine. They have also engineered the steering set up so that it requires slightly less turns lock-to-lock, too.

We fitted this conversion to a Mk 1 Golf Cabrio, with the engine out of the vehicle - it is strongly recommended to do it this way as access is so awkward.

1 After removing the track rods ends using a ball-joint splitter (if required) the old steering rack must be unbolted. To do this, lift the rubber gaiter and undo the nut holding the clamp bolt to the top of the splined pinion shaft. Tap this bolt out, and unbolt the four nuts securing the U-brackets to the body. It should now be possible to remove the whole unit from the car (there's also a small earth strap that must be unscrewed). The existing studs must be removed from the bodywork next, as the new rack needs to be fitted further forward on specially-made spacer brackets.



3 This vehicle is an automatic, but most are manual gearshift models. TSR supply this bracket to be bolted to the rack to replace the original gearchange bracket fitted to the original rack. The positioning of this bracket is extremely critical. Measure the position of the original bracket with reference to the vehicle's bodywork so that the replacement bracket is precisely positioned. If you don't, the gearchange could be awkward to use and you may find that you need a fair amount of trial and error adjustment to be carried out, moving the bracket both from side-to-side and turning it in the vertical plane.



5 TSR Performance supply the correct Volkswagen adjustable-type power steering pump and the kit comes with all the relevant bracketry. It is possible that some of the components supplied may not be identical in every detail to those shown here because of slight variations in types produced. The pump's upper bracket is fitted through some of the water pump securing bolts as shown. Find out which bolts have to be removed by looking at the new bracket and take out the relevant bolts. Fit the top bracket (or mounting plate) over the top of the water pump using the replacement bolts taking account of the extra length required to pass through both the bracket and the water pump.



7 This metal plate is the pump bracket and is supplied with the necessary bolts and spring washers. This is bolted firmly to the pump at this stage, and is best attached by clamping the bracket in a vice to enable it to be tightened up fully without damaging the pump body. The pump body can now be fitted to the lower engine bracket by inserting a bolt through the slotted hole, using a socket with an extension on it - or a pair of very long fingers if you have them! The other end of the bracket is then bolted in place via a threaded hole in the block. As this probably won't have been used before, the thread may need running out with a tap. The fixed adjuster bracket is now bolted to the engine block and fitted over the outer face of the pump bracket.



9 The pulley for operating the pump is simply bolted into and onto the existing pulley. If your engine's crank pulley is not of the correct damped type, you may have to change it for the correct type. Contact TSR Performance for further advice if necessary - they point out that not all crank pulleys are the same. Even if you have the correct damped type of pulley fitted, you may be fooled into thinking that the supplementary pulley won't fit. The inside of the damped pulley tends to become rusty and you'll need to clean it back to shiny bare metal. Cover it in copper slip grease to prevent further corrosion and fit the new pulley in place. The old water pump pulley is removed and discarded and has to be replaced with the new pulley supplied as part of the kit. Just for reference, the power steering pump pulley is the smallest and has three extra holes in it. The new alternator belt runs off the original crank pulley, while the power steering pump belt also runs the water pump. The adjuster bolt is then tightened to provide the correct amount of tension in the power steering pump belt.



2 A major modification required by the TSR Performance kit is to fit this steering column coupling to the bottom of the existing steering column. Bearing in mind that the pinion shaft on the replacement rack is not in the same position as the one on the original Volkswagen rack, this coupling may possibly foul on the original hole in the bulkhead. If that's the case, you'll need to open the hole up to gain additional clearance.



4 The track rods are not exactly the same as those on the original rack and it's necessary to extend the left-hand track rod with the extension piece supplied with the TSR kit. You can now screw the regular track rod end locknut on to the track rod and screw the track rod end-plus-extension on to the track rod arm. The tracking must then be adjusted in the normal way by your local garage or tyre specialist.



6 This is the lower mounting bracket ready to be fitted, complete with its fixing bolts, also supplied with the kit. Remove the existing bolts, as necessary and fit the new bracket into place. It's important to note that none of the fixing bolts for either of these brackets should be tightened down at this stage.



8 The adjuster mechanism can now be fitted to both brackets. The bolt which passes through the mechanism applies pressure through the fork at the bottom of the adjuster bracket. The stud (through which the bolt passes) passes through the slotted hole in the adjuster bracket and a plain hole in the pump bracket. It is most important that when you adjust the power steering belt, that the locknut on the inside of the brackets is released before the adjuster bolt is turned, and that the locknut is retightened after adjustment.



10 The perfect location for the power steering fluid reservoir will depend on the layout of your particular Golf's engine bay. With this particular vehicle, the best position was on the right-hand inner wing, just ahead of the suspension strut. Once the reservoir and bracket were fitted into place, the bracket was painted body colour and secured with rivets. The final job is to screw all the high pressure and low pressure hoses in to place, top up the system and bleed it. Don't start the engine at this stage. Remove the spark plugs, crank the engine on the starter and keep topping up the reservoir without letting it run dry. When the system is full, replace the plugs, raise the front of the car off the ground and run the engine. Turn the steering from lock-to-lock until no more air bubbles appear in the reservoir and no more topping up is needed. Turn carefully so as not to damage the steering at its end-stops.

