

Welcome Assistance

Converting a Triumph 2000 or 2.5 from manual steering to power assisted steering (PAS) isn't a clear cut job, with a number of options and pitfalls. The parts needed are scattered around the factory parts catalogues, so parts required can easily get overlooked. CHRIS WITOR has created a text page in a format that might have been used in a parts catalogue if a conversion was a factory option with an extra column on availability. PAS adds around 32 lbs to the front of a car which this is a significant. Then there's the parasitic power loss of the pump being constantly driven. However sometimes needs must, and PAS becomes necessary.



Not all models can easily be converted to PAS, especially the early MK1 2000 to MB70,000 as the engine block isn't compatible with the rear pump mounting bracket 153072.

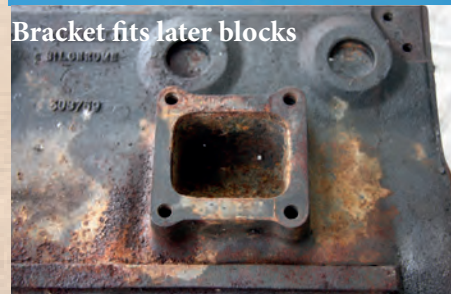


Early MK1 Block

The resourceful could overcome this by fabricating a secondary adaptor bracket.



Bracket fits later blocks



Another problem is earlier MK1 2000 didn't have a cut out on the RH 'chassis' rail to clear the pinion tower of the PAS rack.



I'm told the rack can be fitted with difficulty if bolted to the cross member first and jacked up into place. Otherwise some panel beating may be required...

I have focused on the conversion with a viscous fan hub, as this is the most viable option. There were far more later cars 2000TC, 2500TC & 2.5S fitted with PAS and a viscous fan, so the conversion will be determined by availability of the crank pulley.

Pulley to Crank Damper PAS



Left TKC1788 Viscous Fan
Right 150215 fixed fan

The cases for using a fixed fan is to be period correct and retain an existing fixed fan, or to save the cost of converting to viscous fan. However the 150215 fixed fan pulley is rare.



Parts required to convert to viscous fan

Having decided what fan to use there are still pitfalls to be avoided. Steering tie levers are one. The power rack is mounted with a lower centre line due to its larger diameter in relation to sump clearance. Therefore dropped tie levers were developed to prevent bump steer which would otherwise occur. I've seen converted cars with manual steering tie levers still fitted...



Manual Steering

Power Steering

Workshop

If fitting to a car with automatic transmission, to prevent the crank turning when removing and refitting the crank pulley bolt, place a 9/16 AF socket on one of the 4 drive plate torque convertor bolts. There is an access hole in the engine back plate.

Other precautions on PAS cars is the check the routing of the supply & return pipe, rack to pump. It is common for the engine sump to chafe through these, causing fluid to leak. Another fault that can develop with PAS, is the steering tightens up, often going tight to loose when turning the steering wheel. This is often misdiagnosed as a problem with the rack or pump, when the cause is just the universal joint starting to seize on the intermediate shaft. Tightness here isn't subject to power assistance. Changing the UJ isn't viable, so best replace the unit.



Intermediate shaft assembly 150213

Conversions often get carried out without the radiator bottom hose being changed. The PAS version uses two hoses and a metal link pipe 153509 to prevent the bottom hose chaffing on the pump.



There is a spacer 152145 which fits between the lower forward pump mounting and front plate bracket, which is often left out. This causes miss-alignment of the pump belt.



Spacer 152145 often lost or missing

When fitting 3 studs in the block to mount the rear pump bracket, clean out the threads with a 3/8 UNF tap



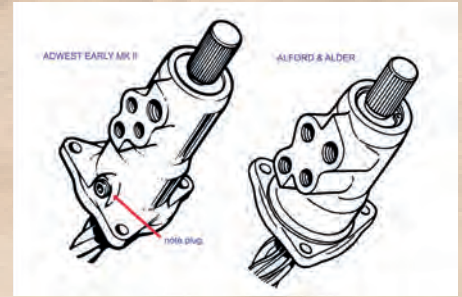
Engine front plates 216995 with the pump bracket mounting are increasingly hard to find. A solution is to use a weld on plinth. To fit this, some of the stiffening rib needs machining off the manual steering front plate. Best take to a precision engineers with a vertical mill.



This is what a conversion might be like with a fixed fan pulley

With the value of the 2000 range increasing, less cars are being dismantled so availability of parts to complete the conversion is becoming a problem. I'm always struggling to find Pumps, Racks and Cross members. If anyone has any surplus in the depths of their garage don't throw them away!

A Stag rack can be converted – only the lock stops differ.



Some of the earliest MKII used an Adwest rack. These are interchangeable with the later common Alford & Alder. My memories of using the Adwest rack resulted in very light steering, probably overly light for most.

Light steering and soft suspension with no anti roll bar results in lurchy handling, one has to be cautious with steering inputs, unless the suspension is upgraded.

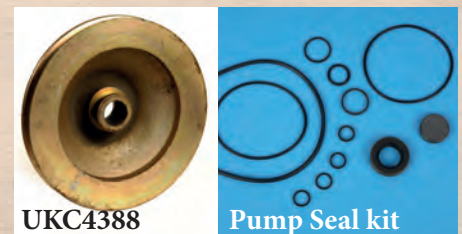
The PAS rack has around 2.5 turns lock to lock, so is effectively a quick rack, compared to the original manual rack ratio of around 4 turns.

The power steering rack is a lot stronger than the manual rack. The manual rack bar is a barely adequate 13/16" (20.63 mm) diameter, whereas the power rack is 1 1/8" (28.57 mm) nominal size.

Unlike a manual rack, the teeth of the power rack bar and pinion are likely to last the life of the car. The main drawback of the PAS rack is the seals fail so reconditioning is needed from time to time.

Pump

The pump is known as a Saginaw, and is of USA origin. It was used on a large variety of cars of the era, but often with different pulleys. In other applications the return pipe exits the reservoir at 90 degrees whereas this pipe is straight on the 2000 range. Sometimes thread tappings for mounting brackets are in different locations. Also operating pressure required on the 2000 range is 750 to 850 Lbf/in². This can be higher if the pump came from certain power steering box cars. As time goes on, we might have to become resourceful at converting pumps from other applications.



Press on pulley UKC4388 are freely available to convert pumps with different pulleys. Pump must be dismantled to press on a new pulley. Could be worth re sealing at this point



Power Steering Conversion RHD with Viscous Fan			Chris Witor
	MKI From MB70,000 and all MKII		Mar-18
Part no.	Description	Qty	Availability
311979	Core RHD Power Rack to Rebuild	1	Random Used
311979R	Re-Build PAS Rack	1	Good Specialised
151841	Track Rod End	2	Good
150213	Intermediate Shaft Coupling Assy	1	Good Remanufactured
215210	Tie Lever RH	1	Fair Used & NOS
215211	Tie Lever LH	1	Fair Used & NOS
309156	Cross Member	1	Random Used
149430	Bracket Mounting X Member to Rack LH	1	Fair Used
149431	Bracket Mounting X Member to Rack RH	1	Fair Used
150711	Plate Mounting Rack Adjusting & Reinforcing	2	Fair Used
HU1009	Hex Screw 7/16 UNF Rack to Mounting Bracket	4	Good
HB1020	Bolt 7/16 UNF Rack Bracket to X Member	4	Good
WP0816	Washer 7/16 x 1 1/4 od x 1/8 , Rack Bracket to X Member	4	Specialised or Used
TN3210	7/16 UNF Nyloc Half Nut, Rack Bracket to X Member	4	Specialised or Used
119450	Bush kit 4 Rack to X Member	1	Good PU or RP Rubber
154195	Supply Pipe RHD High Pressure Hose	1	Good Remanufactured
154196	Return Pipe RHD Rack to Pump	1	Good remanufactured
308741	Pump, bolt on Pulley or UKC4439 pressed on Pulley	1	Random Used
HU0956	Hex Screw 3/8 UNC x 3/4 Pump to Front Bracket Upper	1	Good
HU0958	Hex Screw 3/8 UNC x 1" Pump to Front Bracket Lower	1	Good
152145	Spacer Tube Pump to Front bracket	1	Good Remanufactured
HN2059	Nut 3/8 UNC Pump Stud Belt, Adjustment	1	Good
153072	Bracket Pump Stud to Block	1	Random Used
216996	Bracket Front Plate Plinth to Pump used	1	Random Used
216995	Engine Front Plate	1	Poor, advise Weld on Plinth
HU0906	Hex Screw 3/8 UNF x 3/4 Bracket to Plinth	1	Good
128773	Stud 3/8 UNF Engine Block to Bracket	3	Specialised or Used
HU2009	Nut 3/8 UNF	3	Good
WP0009	Washer 3/8 flat	9	Good
WL0209	Washer 3/8 Spring	6	Good
215350	Gasket Engine Front Plate	1	Good
211126	Gasket Timing Cover	1	Good
138792	Gasket Water Pump Impellor Housing to Head	1	Good
GCB10900	Belt, PAS Pump Drive	1	Good
TKC1788	Crankshaft Pulley adapting Viscous Fan Hub	1	Random Used
HB1326	Bolt Long 5/8 UNF Pulley to Cranksaft	1	Good Specialised
155516	Washer Special Crank Pulley Bolt to Viscous Fan Hub	1	Good Remanufactured
TKC101	Viscous Fan Hub	1	Good Advise New
UKC4374	Nut Ring Viscous Fan Hub	1	Fair, Used
HB0172	Bolt 1/4 UNF Retaining Fan	4	Good
RKC0092	Fan Cooling to Suit Viscous Hub	1	Fair, used
153509	Link Pipe Radiator Bottom Hoses	1	Good Remanufactured
GRH555	Hose 45 Degree Pump to Link Pipe	1	Good Remanufactured
GRH554	Hose 90 Degree Radiator Bottom	1	Good Remanufactured