

# **RALLY RAID PRODUCTS T7 OPEN CARTRIDGE EXTREME FORK UPGRADE RRP 616**

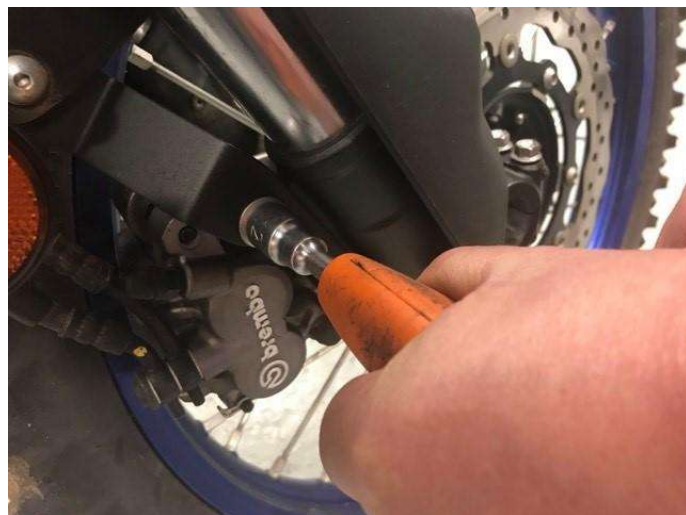
**NOTE:** BEFORE COMMENCING WORK ON THE CONVERSION, TAKE TIME TO READ THE INSTRUCTIONS CAREFULLY. ALL WORK CAN BE CARRIED OUT BY A COMPETENT MECHANIC, BUT IF YOU ARE UNSURE PLEASE CONTACT US OR A MECHANICAL PROFESSIONAL.

KEEP ALL PARTS THAT ARE REMOVED, AS IT IS POSSIBLE TO REMOVE OUR KITS AND RETURN THE BIKE TO STANDARD, IF REQUIRED.

For support during installation please email [info@rally-raidproducts.co.uk](mailto:info@rally-raidproducts.co.uk)

1. Using OEM centre stand or suitable jack stand, ensure front wheel can clear ground slightly.

2. Using 12 mm socket, remove both bolts holding brake caliper to fork leg, and lower caliper away from disc.



3. Using our special tool, or 10 mm socket, undo both pinch bolts on right-hand lower fork leg, they only need to be undone a couple of turns, they do not need to be removed completely.



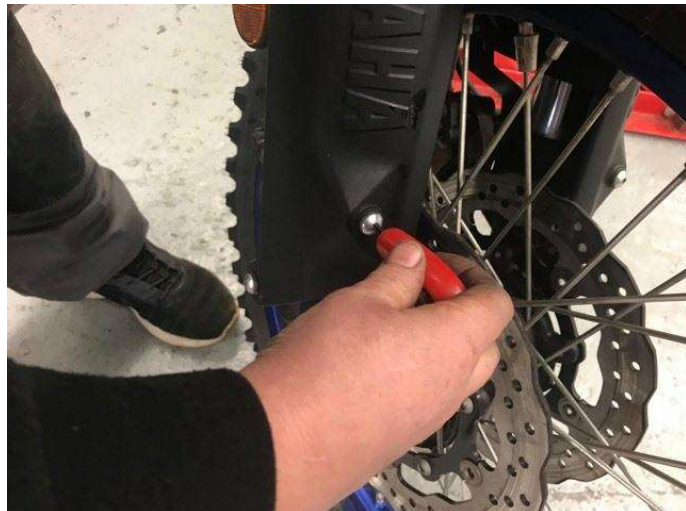
4. Using our special tool, or a 19 mm hexagon bit, undo front wheel spindle and remove from axle whilst supporting the front wheel.



5. Using 5mm Allen key, remove both screws on the lower front and side of fork leg.

**NOTE : It is easier to do the fork conversion one leg at a time so that the front fender is always attached to one fork leg, rather than hanging by the brake hoses.**





6. Undo slightly, both top pinch bolts on top triple clamp, a couple of turns using 10mm spanner.



7. Using a 19 mm spanner, undo the fork cap slightly.



8. Slacken both bolts on the lower right-hand triple clamp, with 10mm spanner, and slide out complete fork leg.



## FORK CARTRIDGE REMOVAL AND DISASSEMBLY

1. Remove rubber bung from the bottom of the lower fork leg to expose the compression adjuster. Unscrew the compression adjuster with a flat screwdriver to its stop. (Anti-Clockwise)



2. Invert the fork leg and hold in a suitable clamp then using a 14 mm hexagon bit, undo the compression adjuster at about half a turn to break the seal.



3. Invert the fork leg again and clamp in a suitable vice and using a 19 mm spanner undo fork cap completely.



4. Slide up the fork lower to expose the fork spring, pull down the fork spring slightly, and hold the locknut under the cap with a 17 mm spanner, then twist off the cap completely with 19mm spanner.



5. Remove the fork spring and invert the fork leg to drain the oil from the leg, try and put one finger over the top of the piston rod to prevent the 5 mm diameter aluminium rebound needle from falling out when the fork leg is upside down. It is useful to stroke the piston rod up and down slowly to help remove the oil from inside the fork leg.



6. Holding the plastic spring guide securely, remove the locking nut with the 17 mm spanner, retain the nut, then slide off the plastic guide and discard. It should now be possible to withdraw the aluminium rebound needle completely from inside of the piston rod, be careful not to damage or bend this needle.



7. Lay the fork tube down and insert the cartridge removal tool into the open end of the fork, it will locate using the four teeth into the top of the cartridge, this may need some wiggling about to get teeth to engage. Insert a suitable bar through the hole in the end of the cartridge tool to gain leverage, and then using the 14 mm hexagon tool unscrew the compression adjuster inside the bottom of the fork leg, once fully undone it will then be possible to remove the complete open cartridge. The compression adjuster is sometimes very difficult to remove, and it is preferable to screw the cartridge back on a few turns with the cartridge tool and then tap the end of the cartridge tool to dislodge the compression adjuster so it can be removed.



8. Discard the compression adjuster and copper washer plus all of the open cartridge assembly.





### FORK SEAL CHANGE (If Required)

1. Using a flat screwdriver, lever off the fork wiper seal gently, and slide it down the fork like to expose the wire clip holding the fork seal in place.



2. Remove the wire clip, using a small flat screwdriver and then warm the outer section of the aluminium tube, next to the fork seal with a hot air gun, this will expand the aluminium slightly to make removal of the inner fork leg easier.





3. Using a sliding action, remove inner fork stanchion from outer leg by repeatedly sliding backwards and forwards until it comes out completely. There should be two split bushes on the end of the chrome inner leg, one at the top of the leg is fixed in a channel, and the other one slides free on the fork leg, there should also be a steel washer, then the oil seal, the wire clip and the dust seal on this assembly.





4. Prize off the top bush by opening the gap and sliding it off the top of the fork leg, the next bush slides straight off, along with the steel washer, then the oil seal, metal clip and dust cover.



5. Clean the chrome leg completely to remove any debris and then rebuild in the opposite order. To prevent any damage to the fork seal from the sharp edge on the top of the chrome tube, it is best to use a small piece of plastic bag or a professional plastic fork tube cap over the open end of the leg, lubricate the plastic and the fork leg with new fork oil to aid insertion of the new parts.



6. On the right-hand fork leg, we supply an O-ring in the kit, this is so the fork stroke can be monitored when out riding, so this is the first part to be put onto the leg.

7. Lubricate the inner of the dust seal and slide it onto the fork leg, ensure it goes on the correct way as per the photographs. Next slide on the wire clip, and then lubricate the fork seal, and slide it over the end of the fork gently, so as not to damage the seal lip.



8. Next slide on the steel washer followed by the thick bush, and lastly the thin split bush, make sure this sits snugly into the recess on the fork leg.

9. Gently slide the fork leg inner into the outer leg until the thick bush is inside the step on the outer leg, with the steel washer above it, using a 43 mm fork leg split tool, slide hammer the washer and bush until it is flush with the top face of the inner recess where the fork seal sits, it should be possible to hear when the washer contacts the bottom face of the fork leg recess.



10. Make sure the outer edge of the fork seal is lubricated with fresh oil, and then using the slide hammer again, press in the fork seal until it is seated in the bottom face with steel washer underneath, then refit the steel clip, this should fit into a small groove on the internal recess of fork leg. It is very important that this clip fits securely, as the fork seal could become loose in operation which would pose a hazard when riding due to a sudden loss of oil onto the front wheel and the brakes, and loss of damping.

11. Lastly, push in the dust seal, and wipe any excess oil from the whole assembly.

## OPEN CARTRIDGE ASSEMBLY

1. Before inserting both compression and rebound fork cartridges, unscrew the relevant compression, and rebound adjuster screws fully (stainless steel screw in centre of fork cap). Do not force the screw past its stop position, hold black outer fork cap and undo preload adjuster anti-clockwise with 22mm spanner, until it stops. Remove the lower fixing bolt with o ring and copper washer.



2. Insert the new open cartridge (with fork cap attached but no spring fitted) into the fork leg enough until it contacts the bottom of the lower stanchion and tighten the screw cap on top of the fork leg - hand tight only using tool supplied.







3. Invert complete fork leg (placing a soft rag on the floor to prevent damage to the fork preload cap) and proceed to start filling with 5W oil through the axle clamp hole. Ensure that the volume of oil being filled is recorded, as there is a total volume needed for each fork leg (450ml total per leg), and it is generally not possible to fill the full amount from the bottom.



4. Fill with small amounts at a time, no higher than the bottom of the threaded hole in the cartridge, lift up the axle 100mm approx. then compress the fork whilst covering the opening with the palm of the hand. This causes air pressure to force the oil into the cartridge.



<p>5. Repeat the above a few times until the air bubbles cease and the oil level remains constant below the lower end of the threaded hole.</p> <p>Note: It is easier to bleed the oil with the rebound leg than the compression leg, because of the check valve inside the compression cartridge, so generally the compression cartridge will need more time to bleed. Use no more than a total volume of 450ml for each fork leg.</p>	
<p>6. Secure the cartridge using the new bolt and copper washer in the bottom of the leg, apply a small amount of Loctite to the thread first (apply a small amount of grease to the o ring on the bolt)</p> <p>Only tighten hand tight using socket as shown.</p>	
<p>7. Invert the fork back into its normal position, cap at the top.</p>	
<p>8. Remove the fork cap with pin spanner (along with any plastic washers). Pull up the piston rod to full extension and screw the plastic spring guide down as far as possible whilst holding the exposed threads above the spring guide, hold thread with fingers not pliers or grips that would damage thread.</p> <p>Be careful not to remove the thin aluminium rod from the centre of the steel piston rod.</p> <p><b>DO NOT REMOVE 5MM THICK PLASTIC WASHER BELOW SPRING GUIDE</b></p>	

9. Do not allow the outer fork tube to go more than 10mm past the top of the chrome inner tube (as shown) or there is a risk that the top DU bush can pop out of the recess and lock the forks. To help expel any remaining air from the cartridge, pull the fork out up to full extension and place palm of hand over open end, and then compress fork, the increased air pressure will push the oil into the cartridge. Also, with fork compressed and both inner and outer tube tops level, pull piston rod up and down to bleed air from within the cartridge.
- THE COMPRESSION LEG WILL HAVE RESISTANCE GOING DOWN BUT FAIRLY FREE ON RETURN, THE REBOUND LEG WILL BE THE OPPOSITE. DO NOT MIX UP THE FORK CAPS.**



10. Check the oil height (air gap), which is 120mm from the top of the inner fork tube (with outer tube level with inner) if too much oil is put in, and the fork has to be tipped over to pour out the excess oil, it will be necessary to move the fork up and down a few times to make sure the fork is fully bled of air, before repeating the operation to get the oil height correct.
- Recommended 120mm oil level is set without spring and compressed forkleg and damper rod fully compressed.**
- For harder off road riding reduce the air gap to 100mm by adding more oil.**





11. Once the oil height is set correctly, then extend the piston rod, check centre adjuster pin is protruding out of the piston rod by about 7mm, push down and it should spring back freely. Slide on the new fork spring, (and any plastic pre load washers required, insert a 6 mm pin, (or screw driver) into the hole in the side of the plastic spring guide, and then rotate the spring clockwise whilst holding the pin, this will compress the spring down and push the piston rod up. Do this until the top of the spring is just below the bottom of the aluminium piece that screws into the plastic spring guide.





12. The preload caps for the fork come complete with three plastic washers per cap, these can be mixed in any combination if they have the same thickness for each fork cap.

The fork cap itself has 11 mm of adjustment on preload, and with two thick washers and one thin washer inside each cap, this can give a maximum of an extra 9 mm preload.

For lighter riders it is suggested to start off without any plastic washers, and then check the fork sag after a few hours riding, to bed the new components in. For slightly heavier riders, and those carrying a lot of luggage, or passenger, then we would suggest putting one or two plastic washers in to start with, and then ride the bike for a while before checking the sag.



13. Place the required plastic washers onto the top of the spring, and then screw on the fork cap by hand until resistance is felt. Tighten fully using a 22 mm spanner on the fork cap and a 17 mm spanner on the aluminium nut.

The fork cap threads should bottom out on to the top of the piston rod so that there is a 1-2mm gap between the top of the piston guide nut and underside of the fork cap before tightening.

Release 6mm pin to allow spring to extend fully.



14. Check that the whole assembly looks correct, and in line, slide the fork outer up to meet the fork cap, start tightening by hand, until resistance can be felt, then use the special pin tool provided, to tighten the cap into the tube as tight as possible by hand.



15. Push the fork leg up and down by hand, with the bottom of the fork leg on the floor, it should move slowly and without any harshness.  
Reset the centre screws to their original damping settings.  
Compression leg 6 clicks in from fully anti-clockwise  
Rebound leg 4 clicks in from fully anti-clockwise.  
Each click is ½ a turn of the screw, later you can adjust it to your preferred setup.



16. Check the axle clamp bolt is fully tightened (40Nm) by holding fork leg lower in a vice (with soft jaws) and clean the forks fully. If the bolt keeps turning because the cartridge is spinning inside the fork leg, then try to use an impact wrench (on low setting) to tighten it before attempting using a torque wrench again.



17. Slide O ring (supplied) over the top of the right hand fork leg, then slide down to lower chrome section. This can be used when riding to check the overall fork travel used. Before each ride, slide O ring back up to the top of the leg (by dust seal) then after riding it is possible to measure the distance from dust seal to O ring to work out what travel has been used.  
NOTE: The forks need to be fully extended to check this measurement, so place on centre stand or get someone to pull the bike over on the side stand, to the left, to raise the front wheel.



## RIGHT FORK INSERTION

1. Insert fork leg back into triple clamps, slide through until there is approx. 7mm of gold fork leg outer showing above the top triple, then tighten both lower triple pinch bolts by hand using a 10 mm spanner.



2. Fully tighten the fork cap, using the special pin spanner, to hand tight. Tighten both upper and lower fork pinch bolts with a torque wrench to the recommended settings listed below.





3. Reattach the front fender with the 2 screws on the lower fork leg, we recommend that the outside steel screw of the fender be replaced with one of our nylon screws, so that in the event of the fork hitting a rock or tree stump, the nylon screw will break rather than the steel screw, forcing the cast lug on the lower fork leg to snap off.



<b>LEFT FORK LEG REMOVAL</b>	
1. Ensure front wheel can clear ground slightly.	
2. Using 12 mm socket, remove both bolts holding brake caliper to fork leg, and lower caliper away from disc.	
3. Using 5mm Allen key, remove both screws on the lower front and side of fork leg. It is easier to do the fork conversion one leg at a time so that the front fender is always attached to one fork leg, rather than hanging by the brake hoses.	
4. Using 10mm socket, remove ABS cover bolt and then slide out ABS sensor from hole in lower fork leg.	
5. Use a Torx driver to remove Torx screw holding ABS sensor cable and bracket to fork leg.	
6. Undo slightly, both top pinch bolts on top triple clamp, a couple of turns using 10mm spanner.	
7. Using a 19 mm spanner, undo the fork cap slightly.	
8. Slacken both bolts on the lower right-hand triple clamp, with 10mm spanner, and slide out complete fork leg.	
<b>LEFT FORK INSERTION</b>	
1. Insert fork leg back into triple clamps, slide through until there is approx. 7mm of gold fork leg outer showing above the top triple, then tighten both lower triple pinch bolts by hand using a 10 mm spanner. Fully tighten the fork cap, using the special pin spanner, to hand tight. Tighten both upper and lower fork pinch bolts with a torque wrench to the recommended settings listed below.	
2. Re attach ABS sensor bracket and cable to fork lower with Torx screw, apply Loctite.	
3. Insert ABS sensor into hole in fork lower, then refit cover, with screw, using 10mm socket, apply Loctite.	
4. Reattach the front fender with the 2 screws on the lower fork leg, we recommend that the outside steel screw of the fender be replaced with one of our nylon screws, so that in the event of the fork hitting a rock or tree stump, the nylon screw will break rather than the steel screw, forcing the cast lug on the lower fork leg to snap off.	

## FRONT WHEEL INSERTION

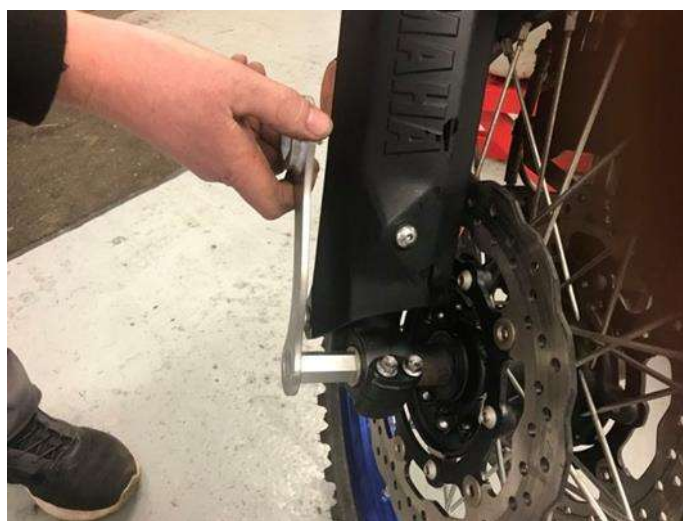
1. Prepare both front callipers by pushing back the brake pads, using a flat screwdriver or tyre lever, and apply Loctite to all 4 caliper bolts.

2. Insert front wheel between fork legs, ensuring ABS ring is on the left side of the wheel, and then insert wheel spacers, using a little grease on the seal faces.



3. Lift up wheel slightly to line up the axle with the right lower fork leg, then insert axle through fork leg and wheel. Make sure the axle is cleaned and greased before insertion.

4. Using our special tool, or 19mm hex bit, in the end of the axle, and holding the left lower fork in line with axle, push axle through and start turning the axle with tool clockwise to start the thread in the left leg.



5. Tighten axle fully by hand.

6. Fit both callipers back onto fork legs using original bolts, tighten with 12mm socket, and torque to specifications below.



7. Remove bike from stand and pump front brake gently until the pads bite, then holding the front brake on, pump the forks up and down before tightening both pinch bolts on lower right fork leg with 10mm socket.

TORQUE SETTINGS			
FRONT AXLE PINCH BOLTS	M8	23Nm	17lb/ft
FRONT BRAKE CALIPER BOLTS	M10	40Nm	29lb/ft
ABS SENSOR BOLT	M6	7Nm	5lb/ft
FRONT AXLE	M16	65Nm	47lb/ft
UPPER TRIPLE BOLTS	M8	23Nm	17lb/ft
LOWER TRIPLE BOLTS	M8	20Nm	15lb/ft