

RATCO INC.

7 OLD DOCK ROAD, YAPHANK N.Y.11080

PH 631-205-2426 FAX 631-205-1071

www.rat-co.com

tony@rat-co.com

INSTALLATION INSTRUCTIONS FOR CH01/CH02 IRS SERIES REAR DIFFERENTIAL CROSSMEMBER REPLACEMENT KIT

NOTE TO INSTALLER: The kit contains all the materials necessary for the replacement of the rear differential support cross member in Triumph TR Series IRS model cars.

READ THESE INSTRUCTION BEFORE YOU BEGIN

It does not include the tools necessary for cutting and welding the various components. A thorough knowledge of welding techniques is necessary to complete to task successfully. If you are not qualified to weld the components as instructed, then we suggest that you seriously consider hiring a professional to do the job. Remember that you will be welding near the gas tank of the vehicle and caution must be taken seriously. Also the procedure requires cutting and grinding of the existing chassis parts and it is essential that the cuts or the grinding do not take much if any of the frame material away. The goal is to remove the brackets only and leave as much substance on the frame rails as possible.

Finally a close inspection of the frame rails is necessary to make sure that there is enough un-rusted metal to weld to. If the area around the repair is not capable of sustaining a weld then the repair kit will not work and could lead to serious problems if you proceed. Be honest in your evaluation as your safety is at stake here.

RATCO INC.
INSTALLATION INSTRUCTIONS FOR CHO1/02 IRS SERIES
REAR DIFFERENTIAL CROSSMEMBER REPLACEMENT KIT

1. Place the car on jack stands at a comfortable working height.
2. Remove the rear wheels and lever shocks or tube shocks if you have a conversion kit installed.
3. Starting at the either side of the vehicle, evaluate the area around the rear differential supports mounting points at the frame. Do you have enough clearance to cut off the shock bump stop and the differential support mounts considering the tools you have to work with?

If you feel that you can reach easily all the points to cut then you can precede with step number 4. If you don't feel that you can cut the brackets off because of lack of clearance then you must remove the hubs and emergency brake line and let the swing arm fall out of the way. Now proceed to number 4.



4. Using a cutting tool (a 4inch grinder with a cutoff wheel works best) remove the shock bump stop bracket. Remove this as cleanly as possible as if you are planning on replacing the lever shocks, you will have to re-weld this back later. The forward side can be cut in two passes at 90 degrees but the rear has to be cut vertically to the top edge. This leaves a tab on the frame which is now cut off and discarded. Later, the bracket will be welded back in position and this small tab will not be necessary. Remove the left side shock bump stop in the same manner.



RATCO INC.
INSTALLATION INSTRUCTIONS FOR CHO1/02 IRS SERIES
REAR DIFFERENTIAL CROSSMEMBER REPLACEMENT KIT



5. Next, cut the differential bracket as close to the frame as possible without removing any of the frame material in the process. The rear most side can be cut horizontal from the frame outside edge completely across to the inboard edge. Do the same to the front edge but leave the width at the edge of the frame rail uncut. This will support the differential until the next step is accomplished. Do both side in this fashion leaving the small width piece at the rail edge un-cut. Replace the hubs using only one or two nuts to hold it to the brake backing plate on the swingarm. Place a jack under the differential and remove the nuts holding the differential onto its mounting studs and let it fall gently resting on the half shafts and the drive shaft. Leave the support in place for safety. It should not fall out with the three drive shafts in place but use the support anyway. This procedure will free the rear cross member from the differential and now you can cut that last bit of metal at the frame rail edge. Once the cross member is free of the frame, remove It and place it aside.

Using a grinder, remove the remaining material to the surface of the frame rail. Try not to remove any material from the rail itself. Once the surface on both sides is ground flush, go to step 6.

RATCO INC.
INSTALLATION INSTRUCTIONS FOR CHO1/02 IRS SERIES
REAR DIFFERENTIAL CROSSMEMBER REPLACEMENT KIT



6. Take one of the “C” channels, turn it upside down and center it on the area in which the old cross member once was welded. Try to center it so that the amount of material is equal on both sides. Next, grind away the flange side of the rail so that the “C” channel slips over the rail cupping it from above. Project the edge of the “C” channel down to the bottom side with a straight edge and remove the material from the flange side so that the second “C” channel cups the bottom edge of the frame rail. And nearly meets the top “C” channel. When you have completed both sides in this fashion, proceed to step number 7.



GRIND BACK
FLANGE



TOP
VIEW



THIS PHOTO SHOWS
THE SIDE VIEW OF
THE RAIL WITH THE
CHANNELS IN
PLACE

RATCO INC.
INSTALLATION INSTRUCTIONS FOR CHO1/02 IRS SERIES
REAR DIFFERENTIAL CROSSMEMBER REPLACEMENT KIT



SIDE VIEW SHOWN WITH
GUSSET IN PLACE. WELD
THE SEAM AND THEM THE
CHANNELS TO THE RAIL

7. Weld the gussets to the top “C” channel and let them cool. This will help later as the inside top weld seam is very close to the body of the car and covered by the exhaust pipe. Welding the gusset prior to installation will make for better clearance on the inside weld as the lower seam is easily reached.

It is time to weld the whole assembly but first, the area on the frame rails that are going to be welded to the new steel has to be cleaned. Using a wire brush or a grinder with a Scotchbrite pad, clean the area around the weld area to bright metal or at least remove the old paint, scale and rust. With both sides of the frame prepared for welding use a c-clamp to hold the “C” channels with the welded gussets, snugly on the frame rails top and bottom sides. Without the c-clamps in place it should look like the photo at the left (side view shown and unwelded). Weld the gussets to the lower “C” channels and then weld the edge of the new steel to the frame rail on three sides. The flange side of the frame cannot be welded.

WELDING HINT: If you have difficulty finding a heat setting that works for both the new steel and the old, then try this procedure. Take a common 10 penny nail and first tack weld it to the edge of the new steel so that it is flush with both old and new. Now reduce your heat settings to weld the nail to the old steel without blowing through. Once this is accomplished you can raise the heat level and weld the nail to the new steel. Since the nail is softer than the new steel but somewhat harder than the old, it will act as an intermediary so that a successful weld can be accomplished.

Remember that the “C” channel structure is what actually will hold the new cross member in the correct position. The welds linking the frame to the new “C” channels will hold the structure from sliding on the frame rail and keep the new cross member in alignment. The integrity of these welds has to be good only. Not perfect!

RATCO INC.
INSTALLATION INSTRUCTIONS FOR CHO1/02 IRS SERIES
REAR DIFFERENTIAL CROSSMEMBER REPLACEMENT KIT

8. Once the channels and gussets are welded in position, it is time to mount the new cross member. The cross member has an angle cut to replicate the angle of the rise in the frame rail. (8 degrees) The longer side of the angle goes towards the front of the vehicle. Place the cross member in position above the lowered differential and then jack the differential up until the studs pass through the differential rubber mountings both front and rear. Replace the nuts and washers securing the differential to the studs and lower the assembly until the cross member rests on the newly reinforced frame rail. This procedure should automatically center the cross member in the frame and correctly place the cross member in relation to the front differential mounting studs. These studs are 13.25 inches apart from one another center to center. Assure that this is the case. One indication is that the cross member would perch itself on the frame rail, equidistant from each edge (about ½ inch). Also the cross member should sit vertical to the frame but not at the rise. It would sit vertically to the frames longitudinal axis. If it is vertical the frame at the rise then the cross member is installed backwards. If there is a space on the forward side of the cross member when it is vertical to the frame, use a filler when welding to bridge the gap. The angle on the cross member is cut to specification so if there is a gap, it might indicate that there are other frame issues at work here.

The important thing is that the cross member be centered in the frame laterally, be spaced from the front differential stud mounts correctly and be vertical to the frame. The gap is not important as it should be small and can be filled. You can nudge the entire assembly one way or another to some degree but not much should be necessary. Once the alignment and positioning of the cross member is assured then it can be welded to the frame rails on three sides. Leave the back open to allow water to drain out.

9. Replace the lever shock bump stops in the position they were before. The loss of metal caused by the cuts is now added back by the new channel reinforcement thickness. If you question where they position, then mount the lever shock and lower the arm. The bump stop must interfere with the flat on the underside of the lever arm. Weld the front side vertically and horizontally and the rear side vertically only.

RATCO INC.
INSTALLATION INSTRUCTIONS FOR CHO1/02 IRS SERIES
REAR DIFFERENTIAL CROSSMEMBER REPLACEMENT KIT

10. Replace the hubs and install the springs, shocks and emergency cable bracket. Check that all nuts and bolts are tight and to the correct torque required. Check that the rear brakes are properly adjusted and lower the car to the ground. The installation is now complete.

IF YOU ARE EXPERIENCING DIFFICULTY WITH THE
INSTALLATION OR SIMPLY HAVE A QUESTION, CALL FOR
HELP AND WE WILL BE GLAD TO TALK TO YOU.

631-205-2426