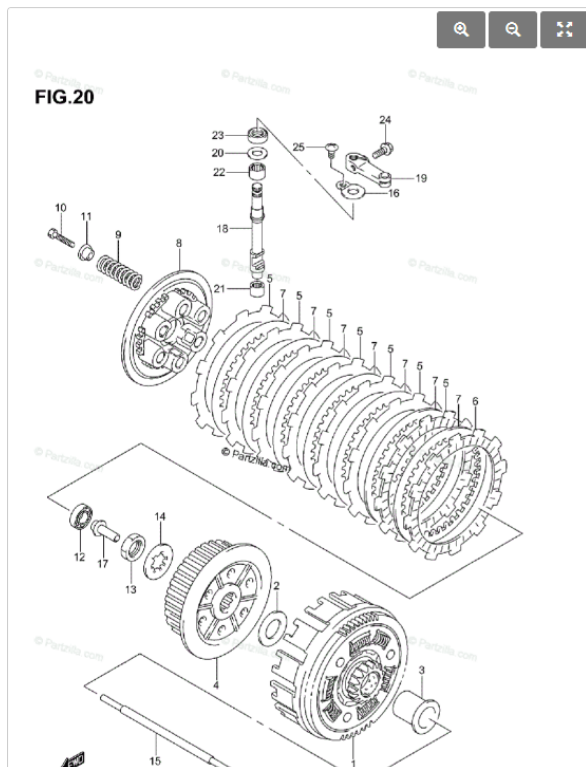


NOTE: Below is the parts list for the Suzuki LT-Z400 clutch sub-system from which components are used to populate the TSR clutch actuator block. The TSR T/GT500 Clutch Actuator kit comes with everything but the following part numbers which the user will be responsible to obtaining:

### Parts List (2005 Suzuki LT-Z400)

#18 - 1 x CAM SHAFT, CLRLSE 23122-29F00

#19 - 1 x ARM, CL RLSE 23271-20902



	23110-07G00	\$21.31		Add
	Ships in 3 to 4 days			
<input type="checkbox"/>	16 RETAINER, CLRLSE OIL SEAL 23117-05200	\$4.61 \$4.29	1	Add
	Ships in 3 to 4 days			
<input type="checkbox"/>	17 PIECE, CL RLSE 23121-29F00	\$23.46 \$21.82	1	Add
	Ships in 3 to 4 days			
<input type="checkbox"/>	18 CAM SHAFT, CLRLSE 23122-29F00	\$51.89 \$47.51	1	Add
	Ships in 3 to 4 days			
<input type="checkbox"/>	19 ARM, CL RLSE 23271-20902	\$31.26 \$30.52	1	Add
	In Stock			
<input type="checkbox"/>	20 WASHER, CL RLSE   10X20X1 09181-10195	\$4.99 \$1.94	3	Add
	In Stock			
<input type="checkbox"/>	21 BEARING, CLRLSE LOW   10X14X10 09263-10014	\$13.76 \$12.80	1	Add
	Ships in 3 to 4 days			
<input type="checkbox"/>	22 BEARING, CLRLSE UP   12X16X10 09263-12024	\$12.89 \$12.59	1	Add
	In Stock			
<input type="checkbox"/>	23 SEAL, CL RLSEARM   10X20X6 09282-10012	\$8.11 \$7.92	1	Add
	In Stock			
<input type="checkbox"/>	24 BOLT 01547-0616B	\$2.46 \$2.40	1	Add
	In Stock			
<input type="checkbox"/>	25 SCREW 02142-0610A	\$1.38 \$1.34	1	Add
	In Stock			

## Installation

### Step 1 – Cutting the cover

Remove the clutch actuator side cover from the engine and then remove the original worm gear components, rubber observation cover and clutch cable. Notice the internal circular casted boss in which the previous worm gear was inserted into. The actuator block is secured against this surface using the original 2 x M6 worm gear mounting bolt locations. See Figure 1 below:

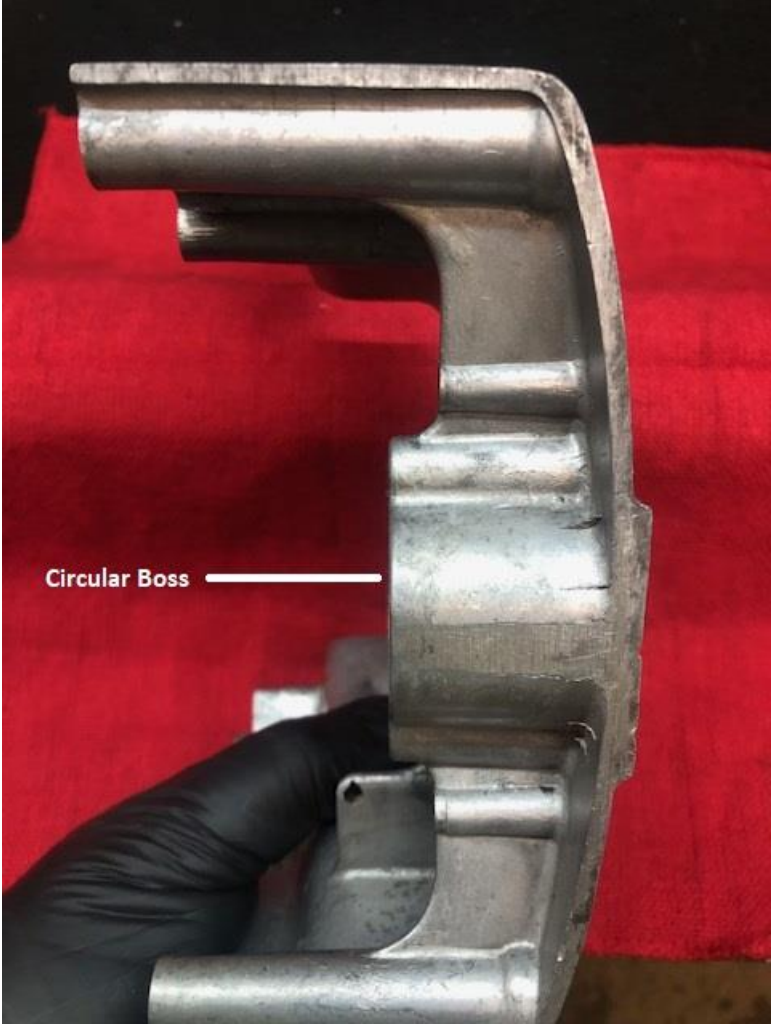


Figure 1

There is no adjustment necessary in the actuator block position as it fits only one way into the 2 x M6 threaded holes within the circular boss. For the actuator block to fit and bolted into place, the cover requires material to be removed. See Figure 2.



Figure 2

The two cuts required in the casted side cover are relative to circular boss surface (Figure 1) as the actuator block mounts upon this flat surface. Cutting the case can be accomplished either by a milling machine (fixturing required) or using a high-quality hacksaw brace/blade.

NOTE: When using the hacksaw approach, take care to ensure the blade is parallel to the circular boss "flat" for the 1.855" (47.1mm) cut and 90 degrees for the 1.560" (39.6mm) cut. Cutting shy of the finished dimensions is recommended when using the hacksaw and then using a coarse flat file to then complete material removal keeping the file parallel relative to the circular boss. The objective is to have no gaps between the actuator block and the side cover. Frequently check the fit of the actuator block to the cut to ensure a precise and accurate fit. Figure 3 below depicts the cut dimensions required to fit the actuator block.



Figure 3 Illustrates the Finished Cut / Installation

### *Step 2 – Installing the Actuator Block*

Note that the internal components within the actuator block are not installed until after the block is secured to the side cover. Using the same hardware that was removed to secure the worm gear assembly to the cover, secure the new aluminum block to the cover. It's always a good idea to use Loctite "Blue" on these M6 Phillips head bolts. Note this hardware can be replaced if desired, just make sure the hardware "head height" does not enter into the vertical shaft space of the block.

### *Step 3 – Assemble the Block Components*

Once the block is secured into the case cover, place the lower bearing (#21 provided) onto the lower end of the (#18) actuator shaft with the shaft oriented upside down to prevent the bearing from falling off. Orient the cover/block assembly upside down as well and then insert the shaft up into the block (this prevents the bearing from falling off). Once the shaft is fully inserted, return the cover/block assembly to the normal upright orientation. Insert the (#22 provided) upper bearing, the 2 x (20x10x2) spacer washers provided (these replace #20), the (#23 provided) seal and the (#16 provided) retaining plate. Secure the plate with the (#25 provided) 5mm flange bolt. The actuator is now fully assembled. Note: Do not mount the aluminum lever arm to the top of the paddle shaft at this time.

### *Step 4 – Indicate “Flat” of Paddle*

The shaft is now captive and free to rotate in the block. Rotate the shaft such that the “flat” of the paddle is perpendicular relative to the push rod axis. Using a marker draw a line on top of the shaft parallel to the paddle “flat” (FL = flat line). Note: This “flat” position is in line with the front to back centerline of the bike.

### *Step 5 – Preparing the Push Rod End*

The push rod end which inserts into the actuator block needs to be shortened and reshaped. Apply a hemispherical shape to the end as shown (Figure 4). The next step is to heat treat the end. First off, be sure to wear protective equipment to protect skin, eyes, etc before executing this next step. Using a Propane, Mapp, Acetylene, etc gas torch, heat the newly shaped tip to a glowing cherry red color. Once this color is attained, quench the rod into a vessel of room temperature water. The rod tip is now ready.



Figure 4

### Step 6 – Adjusting the Push Rod Length

The stock Suzuki T/GT500 design uses two identical length pushrods. The rod closest to the actuator block will require shortening at the end opposite the newly shaped end. The first step is to verify that the clutch basket has a complete set of both drive/driven clutch plates installed which together are of the proper in-spec “stack thickness (mm)” along with the 6 springs full loaded. This is important to determine the correct length of the pushrod. Insert the newly reshaped pushrod into the transmission with the new shape end facing the actuator block. Rotate the actuator shaft such that the FL is parallel (open) to the pushrod axis. In this position the stock length pushrod will insert beyond the paddle. Test fit the actuator side cover onto the engine ensuring that the push rod inserts into the actuator block. With the original clutch adjuster rubber observation plug removed, view the push rod relative to the paddle flat. The required length of the push rod which inserts into the actuator block will be close to 4 11/16” (119mm). DO NOT cut the push rod to this length as there can be variations in clutch baskets, pressure plates, etc. The finished rod length must be such that when the paddle shaft is rotated clockwise and the side cover is firmly in place, first contact of the paddle is when the FL is ~20 degrees open perpendicular to the push rod axis. Shorten as needed in small increments on the end opposite of the newly shaped end of the pushrod, always checking after each cut to see if the proper length has been achieved. Care here is very important as a small incremental, iterative methodology is the best procedure so as not to over-shorten the rod. Do not rush this step!

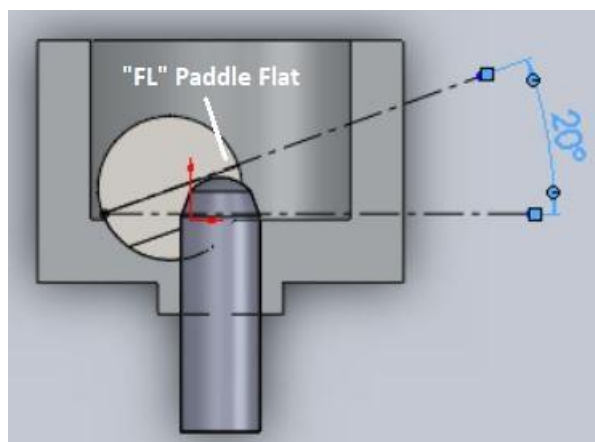


Figure 3

### Step 7 – Secure the Clutch Actuator Cover

Secure the cover using a combination of the original M6 bolts in all locations except the upper left bolt point on the actuator cover and remove the upper right bolt on the ignition cover. For now, do not install the cable bracket, stand-offs and provided M6 bolts.



### *Step 8 – Connect the Clutch Cable*

Insert the clutch cable through the unmounted stainless steel cable bracket and thread a 8mm nut over the cable end which now provides a jam nut on either side of the bracket. Using a thin Dremel cutting wheel, cut a slot which is equally as wide as the stainless steel clutch cable into the provided 8mm x 9mm brass cable ferrule which is provided with the kit. Insert the newly created “split” barrel onto the clutch cable end (Note: You can optionally solder the split closed if desired).

Note that to insert the cable end into the aluminum lever arm, material will likely need to be removed from the aluminum lever arm slotting. This can be accomplished with a combination of the Dremel cut-off wheel along with a flat precision file. Once the cable end ferrule is free to both be inserted and move within the lever arm, you are ready to mount the cable bracket.

Position the two 8mm jamb nuts on the cable bracket such that the clutch cable is fully inserted into the bracket. Using the two provided M6 x 6 standoffs behind the clutch cable bracket, insert the ignition cover M6 x 25mm bolt through the clutch cable bracket as well as the M6 x 80mm bolt through the bracket and into the casings. Tighten as spec'd (~7ft. lbs.).

Rotate the paddle shaft clockwise to full contact with the push rod (rotate clockwise). With the paddle shaft firmly against the pushrod, mount the aluminum lever arm upon the paddle shaft at the closest spline position which extends the clutch cable as much as possible. Mount the lever arm such that the top of the lever arm is flush with the top of the paddle shaft. Install the lever arm pinch bolt to secure the lever arm to the shaft. Note: DO NOT attempt to pull the handlebar clutch lever prior to securing the lever arm pinch bolt as there is risk of damaging the aluminum spline within the lever arm. Adjust the cable placement/tension within the cable bracket using the two x 8mm jam nuts such that there is minimal/near zero cable play. Tighten the two nuts against one another. Slide the clutch cable rubber gator over the adjustable cable fitting. The installation is now completed. Enjoy!

TSR SUZUKI T/GT500 EASY-PULL ACTUATOR BY VINTAGE PERFORMANCE PRODUCTS





