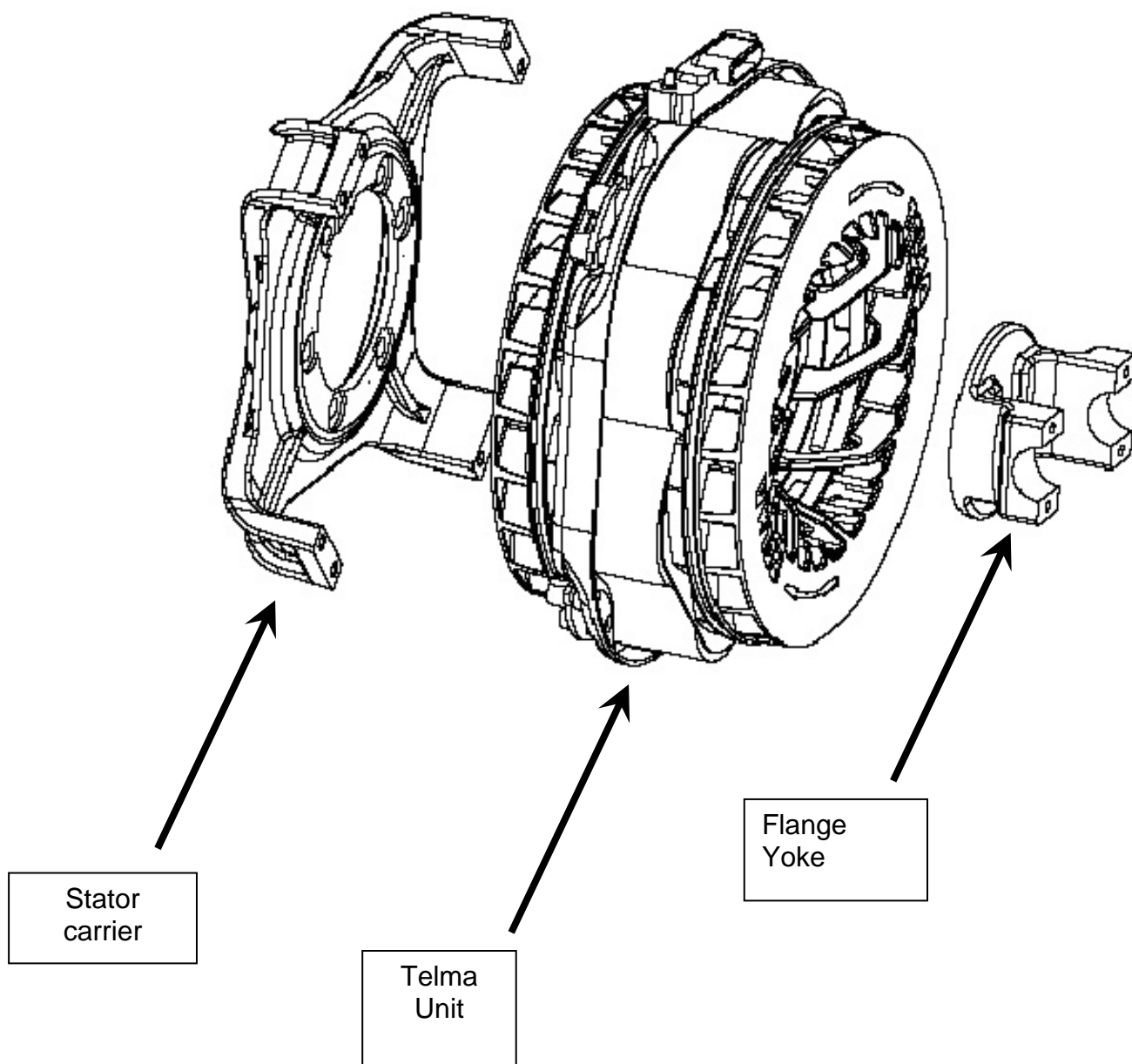


Telma

REPAIR MANUAL

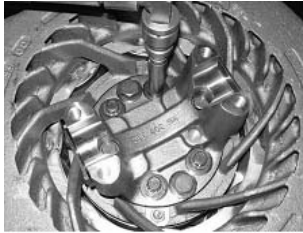
Telma model FV61-00 (FU831310)
replacement on Dana 19060S axle

Exploded view



Disassembly

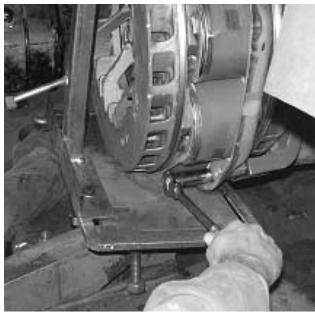
1. Remove the drive shaft and flange yoke from the Telma



2. Support the Telma with a suitable transmission jack
3. Remove the four countersunk 5/8" 12-point-head bolts holding the rotor spacer to the companion flange



4. Remove the 8 stator bolts holding the stator to the stator carrier.
5. Remove the stator shims from each corner and mark them for re-installation in the same location



6. Lift the Telma assembly off the pilot of the companion flange and move the Telma assembly towards the front of the vehicle to clear the axle and remove from under the vehicle.
7. If the stator carrier is replaced, remove the 8 bolts attaching the stator carrier to the pinion bearing cage and remove the stator carrier from under the vehicle.

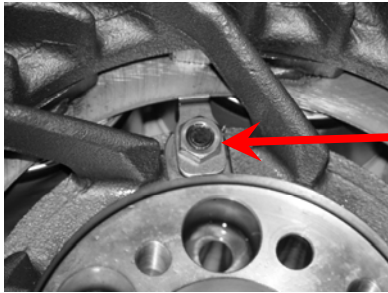


Assembly

1. Spot face pinion cage bolt holes (if pinion cage is replaced)
 1. Raise at least one wheel off the ground so the pinion shaft can turn freely.
 2. Remove all pinion cage bolts except one.
 3. Assemble the shaft guide onto the tool frame.
 4. Install the spot facing bit and shaft assembly into the shaft guide oriented so the long part of the guide will be facing away from the axle.
 5. Install the depth stop onto the shaft.
 6. Mount the assembled tool on the end yoke using longer bolts (not included) that fit into the u-joint strap mounting holes.
 7. Attach the drill motor to the bit driver shaft.
 8. Position the spot facing toll in a pinion cage hole.
 9. Lock down the shaft assembly onto the tool frame.
 10. Make sure the spot facing bit is seated all the way against the surface of the pinion cage.
 11. Lock down the depth stop in a position using a feeler gauge of thickness 0.020" between the depth stop and the shaft guide
 12. Spot face the surface of each pinion cage hole. Remove the one bolt holding the pinion cage in place and move it to a hole that has been spot faced in order to cut all holes.
 13. If after cutting all holes at least once, any hole is not cut all the way around, reset the depth stop using a feeler gauge of 0.010" and spot face again. Repeat spot face procedure using a 0.010" feeler gauge if additional steps are needed to have a completely machined surface around each hole. Contact Telma technical department before total spot face depth exceeds 0.040". This depth will be reached after the first cut of 0.020" depth plus two cuts each of 0.010" depth.
 14. Remove the spot face tool and end yoke from the axle after spot facing procedure is complete.
2. Assemble and install stator carrier (if necessary).
 1. Assemble the stator carrier adapter TIB04014 to the stator carrier VB514701 as shown on the assembly drawing using the four G8 5/8-18UNF x 1 1/2 hex bolts TIF04046 and four hardened flat washers (0.7x1.3x.15) TIF04047. Tighten to 150 lb-ft. Use high strength Loctite 271. Put a paint mark on each bolt and the stator carrier after tightening.
 2. Install the flat washers VF207150 (30 x 14.5 x 2.5mm) under the heads of the longer pinion cage bolts M14 x 2.0 x 60mm (TIF04115).
 3. Install the pinion cage bolts through the six holes of the adapter TIB04014.
 4. Place the six M14 spring washers VF200750 on the pinion cage bolts and carefully install the stator carrier assembly onto the pinion cage making sure the spring washers are between the adapter and pinion cage to space out the adapter past the spot face depth. Tighten the six M14 pinion cage bolts to 114-140 lb-ft. Use high strength Loctite 271. Put a paint mark on each bolt and the stator carrier after tightening.
3. Install pinion companion flange (if necessary).
 1. Install a new pinion seal
 2. Install the companion flange TIF04076
 3. Use a new pinion nut. Tighten to 575-703 lb-ft. Use high strength Loctite 271. Put a paint mark on the nut and shaft after tightening.

4. Install Telma Unit

1. If a new Telma unit is to be installed, remove it from the wooden crate and remove the four nuts and tabs used to secure the Telma during shipping, and discard.



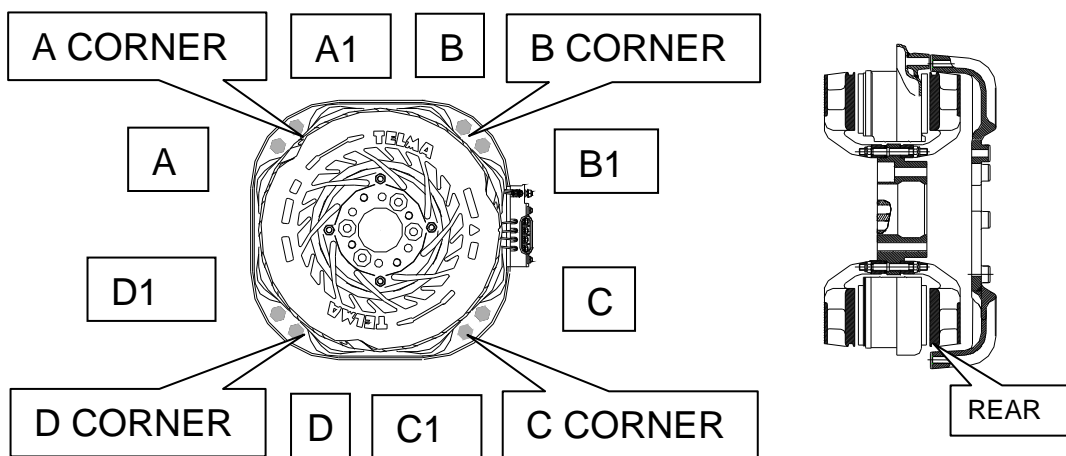
Remove and discard shipping fasteners

2. Lift the Telma with a hoist and place it on a transmission jack. Be sure to properly secure the unit to avoid it falling off the stand. The front side of the unit will have two clockwise arrows cast into the rotor face. The back side will mate up to the Telma stator carrier.
3. Remove an axle shaft or lift a wheel to allow the pinion shaft to rotate.
4. Lift the Telma in position and align the holes of the companion flange with the holes of the rotor spacer. Make sure all holes are lined up. Fasten with the four 12 point head bolts 5/8-18UNF x 1 3/4 in the countersunk holes. Tighten to 150 lb-ft. Use high strength Loctite 271. A pry bar can put in the fins of the rotor and against one of the stator arms to prevent rotation. Put a paint mark on each bolt and rotor spacer after tightening.
5. Rotate the stator so that the electrical connecting block is on the driver side.
6. Use a small pry bar to lift the stator corners and install the 8 bolts VF100360. Use M10 flat washers instead of the Trep washers VF201390 which will be used for final assembly.
7. Re-install the stator shims removed previously into the original locations.
8. Tighten stator bolts to 35 lb-ft and check if front and rear air gaps are within tolerances.



5. Adjust rear air gap (if necessary)

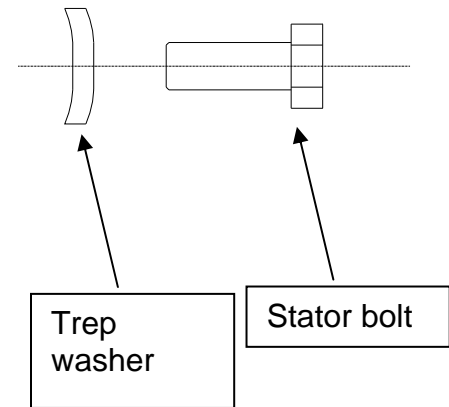
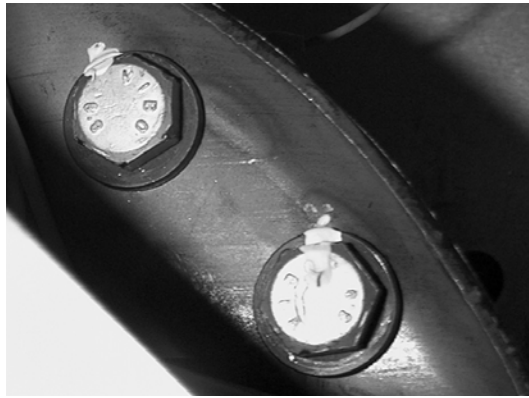
1. If necessary adjust the air gap using stator shim set VB200320.
2. Measure the air gap between the rear rotor and the pole shoe at the end of the coil on either side of each of the 4 stator mounting points and enter into the table below. Use the table to determine how many shims to add or remove at each corner to obtain the target of 0.045"-0.051".
3. Loosen the eight stator bolts slightly and add or remove the required shims to obtain the correct air gap.
4. When adding or removing shims from the corners remember to tighten the M10 stator bolts to 35 lb-ft (48 Nm) before re-checking the air gap. If more than one shim is used, place the thinner shims between the thicker ones and place the thinnest outside shim against the stator carrier. Use M10 flat washers instead of the Trep washers VF201390 which will be used for final assembly.



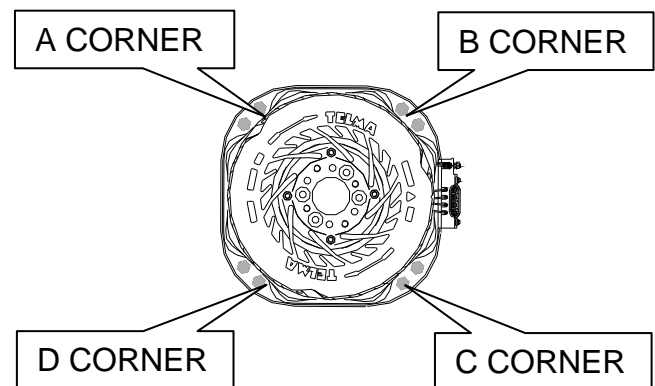
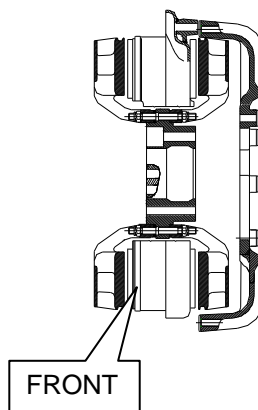
measurement	Average of each corner e.g. (A+A1)÷2	III	
		Thickness of shims to add or remove 0.048"± column II	
		column II less than 0.048" shims to add = 0.048" - column II	column II greater than 0.048" shims to take out = column II - 0.048"
A			
A1			
B			
B1			
C			
C1			
D			
D1			

6. Final Stator Bolt Assembly

After the final shims have been installed, apply Loctite to the stator bolts. Remove one stator bolt at a time, replace the flat washer with the Trep washer, add high strength Loctite 271, and tighten to 35 lb-ft. Repeat for the other 7 bolts. Put a paint mark on each bolt and stator after tightening.



7. Check the air gap for the **front side**. Once the rear side air gap has been set, the front rotor air gap should be within the specified range of .045"-.051". To check this, measure the air gap of the A,B,C and D corners and divide by four. If the average reading falls outside the specified range, the front rotor will need to be removed and re-shimming will be required. Choose the proper rotor shim from rotor shim set VB200290 so that the air gap will be as close as possible to 0.048" and between 0.045" and 0.051". To add or remove rotor adjusting shims take off the outer rotor by removing the four nuts. The shims are under the rotor. Tightening torque for the nuts is 40 lb-ft (44 Nm) $\pm 10\%$.



8. Install the flange yoke

1. Install the flange yoke VB107389 (1610) using the four 12 point head 5/8-18UNF x 3 1/2 bolts.
 2. Use high strength Loctite 271. Tighten to 150 lb-ft. Put a paint mark on each bolt and the flange yoke after tightening.
9. Reinstall the drive shaft. Always use new straps and bolts to attach the u-joint to the yoke to avoid reduced clamp load and spinning of the u-joint bearing cap in the yoke.

10. Assembly View

