

Required Tools

- 33mm Impact Socket
- 42mm Impact Socket
- M6 Tap
- M6 Hex Head Socket
- M8 Hex Head Socket
- 19mm Thin 3/8 Socket
- ½ Inch Breaker bar/impact wrench
- ½ Inch Torque Wrench
- ¼ Inch Torque Wrench
- Nylon Hammer

Required Parts

- 1x TQ0002 Crown Wheel
- 1x TQ0117 Idler Shaft
- 1x TQ0367 Main Shaft
- 1x TQ0014 Forward Gear (Synchro) M/S-24T
- 1x TQ0036 Input Shaft
- 6x TQ0110 Crown Wheel Bolts 60Ft.Lbs.
- 1x TQ0190 Gear Drive Unit Service Kit
- 1x TQ0138 Roller Bearing

TORQUE SETTINGS

- All M6 Bolts- 14.5-16Nm/10.6- 12Ft.Lbs.
- All M8 Bolts- 35-39Nm/26-29Ft.Lbs.
- Ratio Nuts-108 Nm/80Ft.Lbs. Use Solid Loctite 648.
- Crown Wheel Bolts- 80Nm/60Ft.Lbs. Use Solid Loctite 648.

- 1x TQ0135 Roller Bearing
- 1x TQ0037 Lock Nut 80Ft.Lbs.
- 1x TQ0038 Lock Nut
- RTV Silicone Sealant
- Hylomar Universal Blue Gasket and Joining Compound

Additional Parts

- 1x TQ0111 Rear Case
- 1x TQ0112 Front Case



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1. Remove Gear Ratio Cover Plate, check magnet and clean.



2. Remove 6x M6x16 cap head bolts (TQ0143 schnorr type M6 washer) along with 2x 13mm threaded stud (TQ0121).

Check and clean the threads. If the threads are damaged or in poor state it is advisable to rectify them at this stage.



3.1 Remove TQ0037, Locknut Main Shaft (**left-hand thread**) using a 42mm impact socket.

3.2 Remove TQ0038, Locknut Input Shaft (**right-hand thread**) using a 33mm impact socket.



4. Please note, both the ratio nuts are torqued to 80 ft. lbs. and Loctite 648 should be used. The retaining lock tabs should then be peened over the nut.

Remove TQ0141 bearing, this will be replaced.



5. Remove TQ0073 Input Spacer, tapered side facing bearing.



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6. Remove Ratio Pair and inspect for pitting.



7. Remove TQ0036 Input Shaft Coupling, this will be replaced.

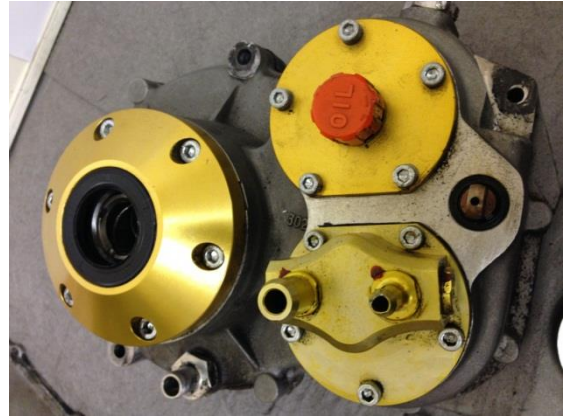
8. Remove TQ0053 Reverse Light Switch using a machined down 19mm long 3/8 drive socket.



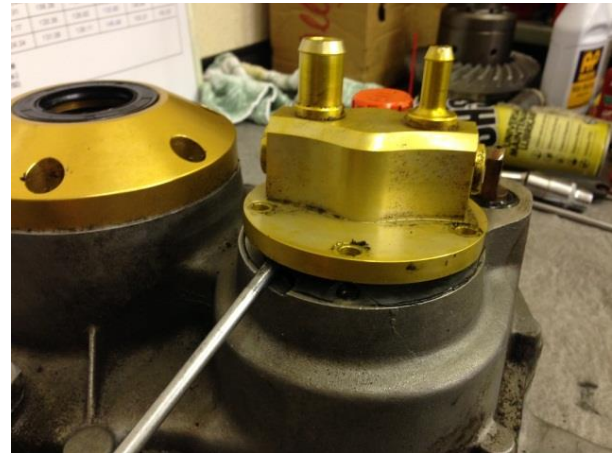
9. Remove Index Plunger/Detent, TQ0130 using a machined down 19mm long 3/8 drive socket.



10. Turn the Gearbox over and remove 10x M6x16 cap head bolts that hold in the oil pump (TQ0025) and breather cover (TQ0120).

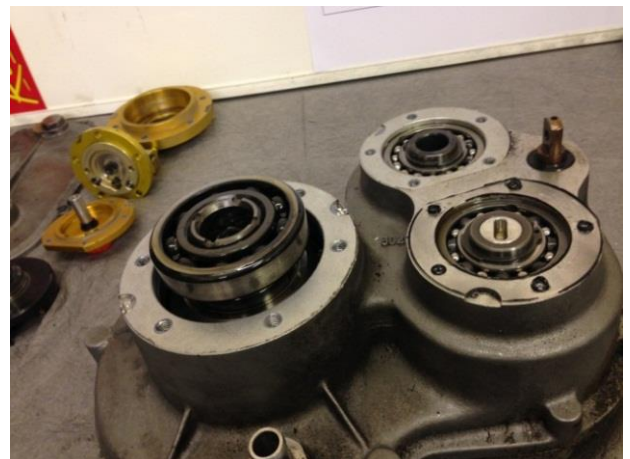


11. Using a flat head screwdriver pry the oil pump and breather cover from the casing using the machined grooves.

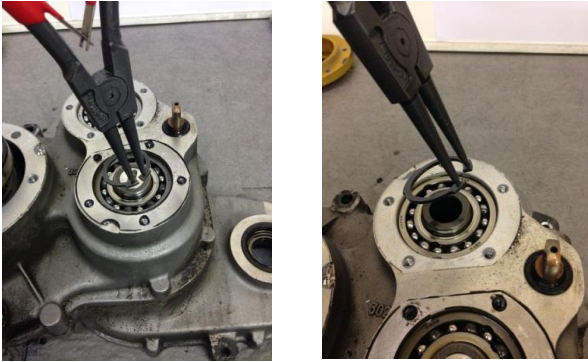


12.1 Remove 6x M8x16 cap head screws for TQ0127 differential retaining plate and remove plate using two screwdrivers to pry the plate from the casing.

12.2 As in step one, check and clean the threads, replace any damaged threads if necessary.



13. Remove Cir clips (TQ0145).



14. Turn the gearbox over, remove 3x M6x50 cap head bolt and 4x M6x25 cap head bolts.



15. Using a nylon hammer break the seal of the two casing.



16. Remove rear case.



17. Remove TQ0137 bearings using a nylon drift and nylon hammer.

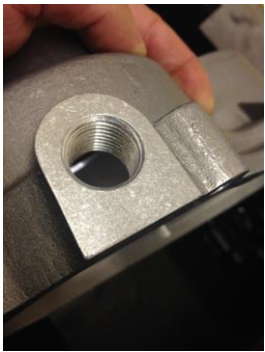


18. Remove TQ0057 oil seal





19. Clean rear case and inspect for cracks (example crack shown on below picture). If any cracks found, replace case. **Ensure to re-stamp ID on the new case.**



20. Remove TQ0117 Idler shaft and inspect teeth for pitting.



21. Remove TQ0040 Main Shaft and all components as one, dismantle, clean and inspect.

Care must be taken with the 3mm ball bearing that locates the thrust washer.





22. Remove TQ0147 Cir clip and TQ0123 Drive Hub.



23. Inspect needle roller bearings TQ0138 and TQ0135 for pitting, over heating or any other wear marks. Replace if necessary.

24. Remove differential along with bearing and crown wheel. Clean front case TQ0112 and inspect for cracks.

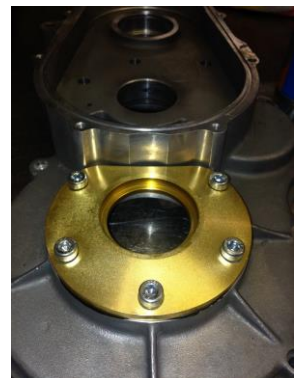
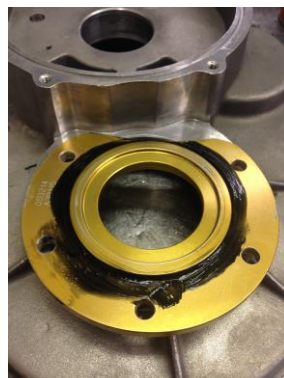


25. Once all bearings and seals are completely removed and all components that you are using again are clean, you can now start the assembly procedure; using the instructions in the reverse order. You will require oil to lubricate all gears/bearings before fitting.

26. Ensure that all the new bearings are fitted along with oil seal (TQ0057); you may require heating the casing to insert/extract bearings.



27. Take the Front Casing (TQ0112) and Differential Bearing Retainer (TQ0118); apply a small amount of silicone sealant around the inner edge of the Bearing Retainer (TQ0118) and fit it to the Front case and tighten evenly 5x M8x25 to 35NM /25Ft.lbs. Wipe the excess sealant away and turn the Front Casing over.



28. Press bearings (TQ0140) onto differential. Fit Crown Wheel and tighten bolts (TQ0110) to 60 Ft. Lbs. using Loctite and lock wire. Fit to Front Case.

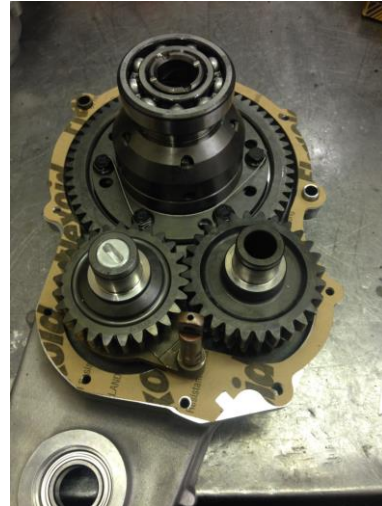


29. Reassemble the Main Shaft with the new bearings and forward gear. Unless the gearbox has sustained substantial damage, reverse gear is commonly used again.

30. Apply Hylomar Universal Blue Gasket and Joining Compound around the Front Case (TQ0112) and fit Gasket (TQ0019). Install Idler Gear (TQ0117) along with the fully assembled Main Shaft.



31. Take the Rear Case (TQ0111); ensure that Bearings TQ0136 are fitted along with Oil Seal TQ0057. Apply Hylomar Universal Blue Gasket and Joining Compound around the Rear Case (TQ0111) and join the two cases together ensuring to locate the two hollow Dowels (TQ0132), before tightening.



32. When refitting Differential Bearing Retainer (TQ0127), Oil pump (TQ0025) and Breather (TQ0120); ensure to use silicone sealant as the joining compound as demonstrated in step 27.

33. Continue with the re-assembly in the reverse order.

For any further questions please contact the Radical Technical department or Gearbox department.

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No.	Part Number	Serial No.	Description	Qty.
1	TG0111	A3R103	Rear Case	1
2	TG0112	A3R105	Front Case	1
3	TG0050	A3R107	Gear Ratio Cover Plate	1
4	TG0040	A3R108	Main Shaft	1
5	TG0115	A3R109	Reverse Gear - Main Shaft	1
6	TG0014	A3R110	Forward Gear - Main Shaft	1
7	TG0116	A3R111	Thrust Washer - Main Shaft	1
8	TG0037	A3R112	Locknut - Main Shaft (Left-hand Thread)	1
9	TG0117	A3R113	Idler Shaft (Incorporating 24T & 28T GEARS)	1
10	TG0002	A3R114	Crownwheel R2.500:1	1
11	TG0118	A3R115	Differential Bearing Retainer	1
12	TG0035	A3R116	Coupling (K7 Engine)	1
13	TG0036	A3R117	Coupling/Input Shaft	1
14	TG0038	A3R118	Locknut - Input Shaft (Right-hand Thread)	1
15	TG0073	A3R119	Spacer - Input Gear	1
16	TG0049	A3R120	Gear Ratio - Input Shaft, R3.394:1	1
17	TG0049	A3R121	Gear Ratio - Input Shaft, R3.394:1	1
18	TG0048	A3R122	Gear Ratio - Input Shaft, R3.409:1	1
19	TG0048	A3R123	Gear Ratio - Main Shaft, R3.409:1	1
20	TG0047	A3R124	Gear Ratio - Input Shaft, R3.235:1	1
21	TG0047	A3R125	Gear Ratio - Main Shaft, R3.235:1	1
22	TG0046	A3R126	Gear Ratio - Input Shaft, R3.071:1	1
23	TG0046	A3R127	Gear Ratio - Main Shaft, R3.071:1	1
24	TG0045	A3R128	Gear Ratio - Input Shaft, R2.917:1	1
25	TG0045	A3R129	Gear Ratio - Main Shaft, R2.917:1	1
26	TG0119	A3R230	Selector Rod	1
27	TG0120	A3R134	Rear Bearing Cover. (Input & Idler)	1
28			Coupling Heavy-duty (K7 Engine)	1
29	TG0044	A3R136	Gear Ratio - Input Shaft, R2.770:1 / R2.508:1	1
30	TG0044	A3R137	Gear Ratio - Main Shaft, R2.770:1	1
31	TG0121	A3R139	Stud - Gear Ratio Cover Plate	2
32			Coupling Heavy-duty (K8 Engine)	1
33		A3R148	Gear Ratio - Main Shaft, R2.508:1	1
34		A3R149	Crownwheel, R2.32:1	1
35		A3R150	Forward Gear (Synchro) - Main Shaft.	1
36		A3R151	Idler Shaft (Incorporating 25T & 28T GEARS)	1
37	TG0187	A3R152	Coupling (K8 Engine)	1
38	TG0122	F7Z501	Differential	1
39	TG0054	A1R203	Selector Fork	1
40	TG0123	A1R115	Drive Hub	1
41	TG0124	A1R116	Drive Disc (Synchro Engagement)	1
42	TG0125	A1R119	Dog Ring (Synchro) Forward Gear - Input Shaft	1
43	TG0126	A2R109	Bearing Cover	1
44	TG0127	A2R114	Differential Bearing Retainer Long	1
45	TG0128	A2R124	Spacer - Differential Front End	1
46	TG0129	E3U128	Index Plunger	1
47	TG0130	E3U127	Index Plunger Housing	1
48	TG0131	E2G127	Filler Plug	3
49	TG0132	E6G169	Hollow Dowel (to suit M10)	2
50	TG0133	0242	Circlip - Internal	1
51	TG0134	0225	Ball \varnothing 1/8	2
52	TG0133	0242	Spring - Compression	1
53	TG0135	0245	Bearing - Roller 35x40x17	1
54	TG0145	0280	Circlip - External	2
55	TG0136	0304	Bearing - Ball 30x42x20	2
56	TG0057	0378	Oil Seal - 1.4x24x7	1
57		0389	Socket Head Capscrew M6x1.0x2.5 LG	4
58		0442	Socket Head Capscrew M6x1.0x1.6 LG	16
59	TG0137	0546	Bearing - Ball 30x42x16	2
60		0596	Sellock Pin \varnothing 4x22 LG	1
61	TG0030	0616	Oil Seal - 42x55x8	1
62	TG0138	0665	Bearing - Roller 40x45x17	1
63		0684	Socket Head Capscrew M8x1.25x20 LG	11
64	TG0033	0748	Oil Seal - 40x62x7	2
65	TG0033	0836	Reverse Light Switch	1
66	TG0031	0851	Washer - 20mm b@re. with oil seal	3
67	TG0143	0879	Washer - Serritor type M6	23
68	TG0144	0880	Washer - Serritor type M8	11
69	TG0283	0883	Magnet - Cylindrical \varnothing 10x20 LG	1
70	TG0149	0972	Washer - \varnothing 14mm bore with oil seal	1
71		0991	Socket Head Capscrew M6x1.0x50 LG	3
72	TG0139	1009	Bearing - Roller 30x62x20	1
73	TG0039	1035	Breather 3/8 BSPx19 TPI	1
74	TG0148	1069	Washer - \varnothing 12mm bore with oil seal	1
75	TG0140	1184	Bearing - Ball 1.500x3.250x0.750	2
76	TG0147	1206	Circlip - External (plain)	1
77	TG0141	1209	Bearing - Roller 25x52x15	1
78	TG0146	1210	Circlip - Internal (plain)	1
79	TG0019	1362	Gasket - Paper (Front/Rear Casing Seal)	1
80	TG0028	1363	O-Ring - Gear Ratio Cover Plate	1
81	TG0110	1476	Crownwheel Bolt	6

