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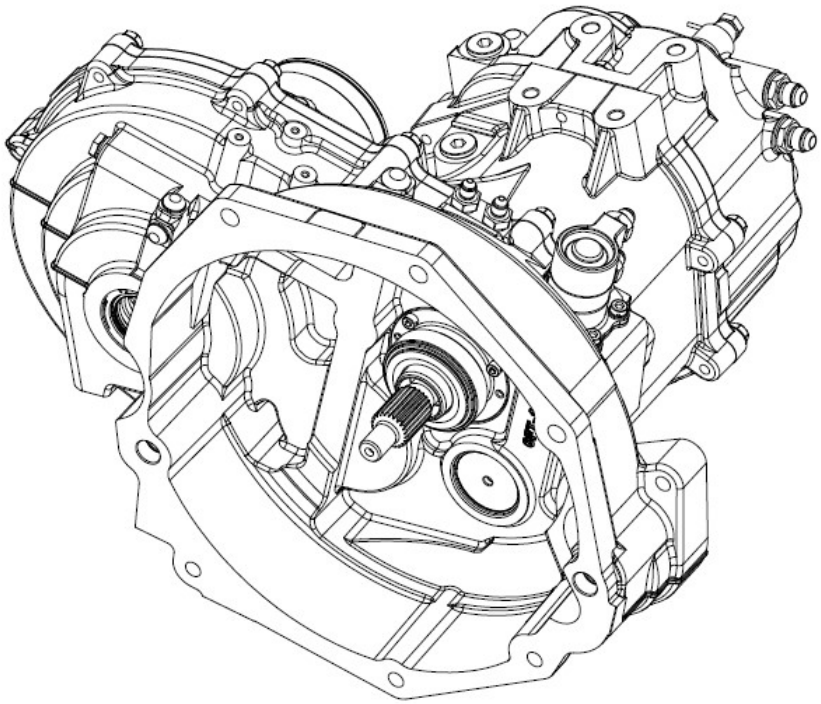

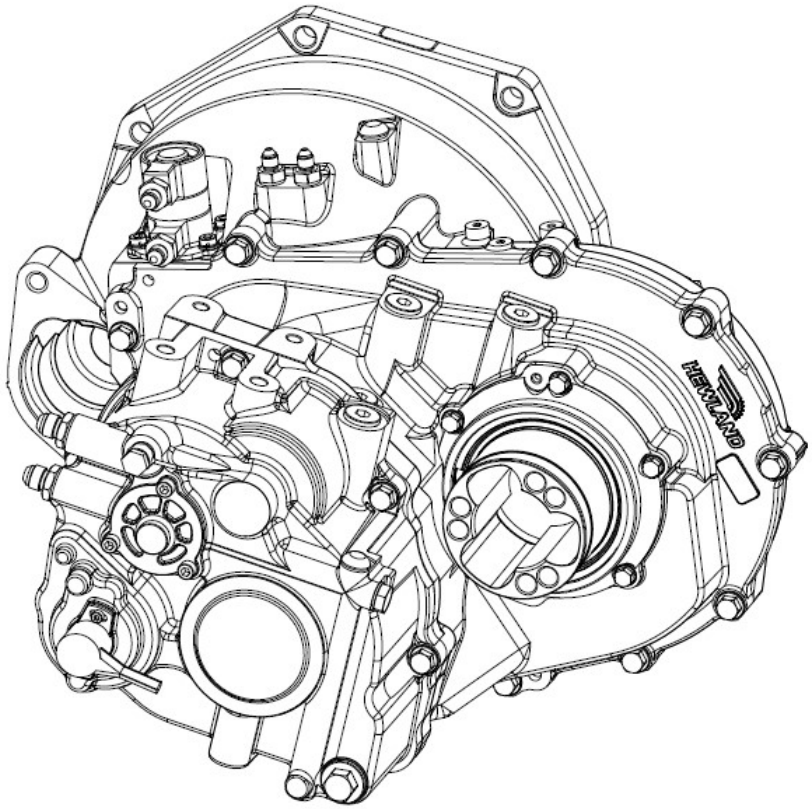

CFT-200

Issue: 19
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CONTENTS

TECHNICAL SPECIFICATION

The CFT gearbox is designed for front engined, front wheel drive cars. The unit is produced with six forward gears and reverse. A Powerflow differential is fitted as standard.

The gear selection mechanism is sequential, shifting is achieved using a pneumatic actuator.

The drive is taken from the engine via the clutch shaft, which turns input and pinion gears to drive the final transmission assembly.

Gear changing is effected through non-synchronising face dogs. An extensive range of gear ratios provides an excellent range of gearing requirements. The gear ratios and differential assembly can easily be changed without removing the gearbox from the vehicle. (Subject to installation restrictions)

Heat treated nickel chrome steel (to Hewland specification) is used to manufacture all gears and shafts. The selector forks are also steel. Lubrication is by internal pump with distribution circuit, and the oil is retained by lipped oil seals.

In general configuration, the CFT is a high tech racing transverse unit which achieves the maximum effective use of power

MAX INPUT TORQUE (Nm)	580
WEIGHT (kg)	43.5kg
OIL GRADE	75W/90
OIL QUANTITY (L)	2.25
ADDITIONAL OIL QUANTITY IN RADIATOR & LINES (L)	0.25 (2.5L Total)
OIL TEMPERATURE (IN OPERATION)	100°C (Recommended) 120°C (Max) - measured at gearbox outlet (pre-cooler)

STANDARD BUILD SPECIFICATION

CFT-200-004 (2024>)

Ratios			Part No.
Final Drive		15;57	GFTW-221-15:57
Gear Ratios	1st	15:33	CFT-15:33-INT
	2nd	17:30	CFT-17:30-L
	3rd	17:25	CFT-17:25-L
	4th	20:25	CFT-20:25-M
	5th	23:24	CFT-23:24-H
	6th	23:20	CFT-23:20-H

CFT-200-004 (2024> GEARBOX BUILDS)

CFT-212-MK2-001 Differential Setup (2022-2023)		
Drive Ramp	45°	CS-1824-E (SIDE RING GEARS) CS-1825-30X45 (SPIDER)
Coast Ramp	30°	
Base Pre load	30-40 Nm	(ZERO TURNS OF ADJUSTED PRELOAD)
Friction surfaces	12	(MAX.) MOLY-COATED TYPE

*** For 2022-2023 GEARBOX BUILDS there were 2 specifications; CFT-200-003 (Cupra) & CFT-200-003A (Audi). The only difference was the exclusion of CFT-212 diff from the Audi Spec.**

CFT-200-002 (2019-2021) & CFT-200-003 (2022-2023)*

Ratios			Part No.
Final Drive		15/57	GFTW-221-15:57
Gear Ratios	1st	12/28	CFT-12:28-INT
	2nd	17/30	CFT-17:30-L
	3rd	20/28	CFT-20:28-L
	4th	21/24	CFT-21:24-M
	5th	25/24	CFT-25:24-H
	6th	30/25	CFT-30:25-H

CFT-200-002 (2019-2021 GEARBOX BUILDS)

GFTW-212-001 Differential Setup (2019-2021)		
Drive Ramp	45°	EGTA-213-7-30X45 (SIDE RING GEARS)
Coast Ramp	30°	
Base Pre load	30-40 Nm	(ZERO TURNS OF ADJUSTED PRELOAD)
Friction surfaces	12	(MAX.)

CFT-200-003 (2022-2023 GEARBOX BUILDS)

CFT-212-001 Differential Setup (2022-2023)		
Drive Ramp	45°	CS-1824-E (SIDE RING GEARS) CS-1825-30X45 (SPIDER)
Coast Ramp	30°	
Base Pre load	30-40 Nm	(ZERO TURNS OF ADJUSTED PRELOAD)
Friction surfaces	12	(MAX.)

RECOMMENDED TIGHTENING TORQUES

Unless otherwise specified within this manual.

			Direct in material						Nut on EN16 Stud		Steel Insert (Helicoil, Timesert, Keensert)			
			Torque in Steel		Torque in Aluminium		Torque in Magnesium		Nut Torque		Torque in Aluminium		Torque in Magnesium	
			Nm	lb/ft	Nm	lb/ft	Nm	lb/ft	Nm	lb/ft	Nm	lb/ft	Nm	lb/ft
Metric	Fine	**M3x0.35**	1.4	1.1	0.8	0.6	0.5	0.4	1.7	1.2	1.2	0.9	0.7	0.6
	Course	**M3x0.5**	1.4	1.0	0.8	0.6	0.5	0.4	1.6	1.2	1.3	0.9	0.8	0.6
	Fine	**M4x0.5**	3.5	2.5	2.0	1.4	1.2	0.9	4	3	3	2	1.8	1.3
	Course	**M4x0.7**	3.0	2.5	1.8	1.4	1.2	0.9	4	3	3	2.5	2	1.4
	Fine	**M5x0.5**	7	5	4	3	2.5	2	8	6	5	4	3.5	2.5
	Course	**M5x0.8**	6	5	4	3	2.5	2	7	5	6	4	3.5	3.0
	Fine	**M6.0.75**	11	8	7	5	4	3	13	10	10	7.0	6	4.5
	Course	**M6x1.0**	11	8	6	5	4	3	13	9	10	8	7	5
	Fine	**M8x1.0**	27	20	16	12	10	7	32	23	23	17	14	11
	Course	**M8x1.25**	26	19	15	11	10	7	31	23	24	18	15	11
	Fine	**M10x1.25**	50	37	31	22	19	14	50	37	44	33	28	21
	Course	**M10x1.5**	40	30	30	22	19	14	40	30	46	34	29	22
	Fine	**M12.x1.5**	91	67	53	39	34	25	91	67	76	56	48	36
	Course	**M12x1.75**	89	66	52	38	33	24	89	66	79	58	50	37
Imperial	UNF	**1/4x28**	14	10	8.0	6.0	5.0	4.0	16	12	12	9	8	6
	UNC	**1/4x20**	13	10	8.0	6.0	5.0	3.5	16	12	14	10	9	6
	UNF	**5/16x24**	27	20	16	12	10	7	32	24	23	17	15	11
	UNC	**5/16x18**	26	19	15	11	10	7	31	23	25	19	16	12
	UNF	**3/8x24**	48	35	28	20	18	13	56	41	38	28	24	18
	UNC	**3/8x16**	46	34	27	20	17	12	54	40	43	32	27	20
	UNF	**7/16x20**	76	56	44	32	28	21	89	66	61	45	39	29
	UNC	**7/16x14**	73	54	42	31	27	20	86	63	68	50	43	32

(This table is taken from Standard:- DOS-006_04)

RECOMMENDED LOCTITE USE

Unless otherwise specified within this manual.

		Loctite 222	Loctite 243	Loctite 270	Loctite 542	Loctite 648
Permanent fixings	Studs being fitted to holes tapped directly into base material			✓		
	Fixing timesert or keensert into tapped hole in base material			✓		
General fixings	Screws / bolts being fitted to holes tapped directly into base material			✓		
	Screw / bolt into timesert	✓				
	Screws / bolts fitted to heli-coil fixings **(LAST RESORT IF LOCKWIRE CANNOT BE USED)**	✓				
Specific fixings	Oil line blanking plugs				✓	
	Differential cap bolts / studs					✓
	Pinion / Mainshaft / Layshaft nut **(ONLY IF LOCKING DEVICE IS NOT INCORPORATED INTO DESIGN)**			✓		
	Crownwheel bolts / studs					✓
	Selector barrel Nut		✓			
	Pinion bearing retaining bolts			✓		

(This table is taken from Standard:- DOS-006_04)

GENERAL NOTES

- Read these instructions carefully and with reference to the illustrations.
- Before dismantling the gearbox, see that a clean tray is available, in which to place the parts.
- Thoroughly clean and inspect all parts before reassembly. Discard any worn or damaged components and replace with new ones.
- Use only genuine Hewland parts as replacements. These are manufactured in our workshops to the fine tolerance necessary and are rigorously inspected.
- Always ensure that locknuts, and oil seals are in good condition when reassembling.
- All studs and screws must be Loctited or wire locked in position, unless stated otherwise.
- Bearing Replacement:

  Some bearings can only be removed or renewed if the casings have been warmed in an oven, or with a heat gun. In the latter case, keep the heat gun moving while heating the casing.

  Note: **Do not overheat**. Test with a thermocouple probe. The correct temperature is (110°C).

  Once a casing is heated, all bearings should be pressed into their respective seating's without delay, thus eliminating the need to reheat. At the correct temperature, fitting the bearings should present no difficulty. During cooling, or when the casings have cooled, it is advisable to once more lightly press the bearings to ensure that they are correctly seated. Do not use countersunk screws to pull bearings into the casing as this can crack the bearings.
  After fitting, ensure that all bearings are sufficiently lubricated with suitable oil to avoid dry running of the bearing whilst the oil finds its way around the system for the first time.

- Oil:

  Fill the gearbox via any of the dog inspection plugs (PLU-137) located at along the top of the maincase. The oil will find its own level within the gearbox.

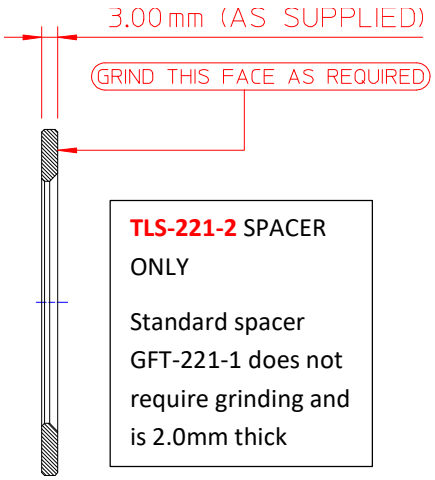
  Note: Too much oil will not directly cause any harm, but is undesirable as it may induce power loss and overheating of internals.

MAINSHAFT BEARING PRELOAD

Mainshaft Height Check

Prior to setting the mainshaft preload, it is important to check the mainshaft height in the maincase:-

- Stand maincase (CFT-201) on its front face. Assemble bearing (BEA-099) into the maincase ensure the bearing is fully seated and that the bearing inner track is in position.
- Fit mainshaft (GFTW-221-#P) into the bearing and slide mainshaft spacer (GFT-221-1) on to the shaft so that abuts to the gear on the mainshaft.
- Measure the distance between the top of the mainshaft spacer and the maincase face (Dim X)
- **Dim X must not be less than 3.30mm**
- If the dimension is less than 3.30mm then replace GFT-221-1 spacer with the thicker spacer (TLS-221-2)
- Re-check the Dim X then adjust the thickness of the spacer TLS-221-2 by surface grinding to achieve a height of 3.4-3.9mm

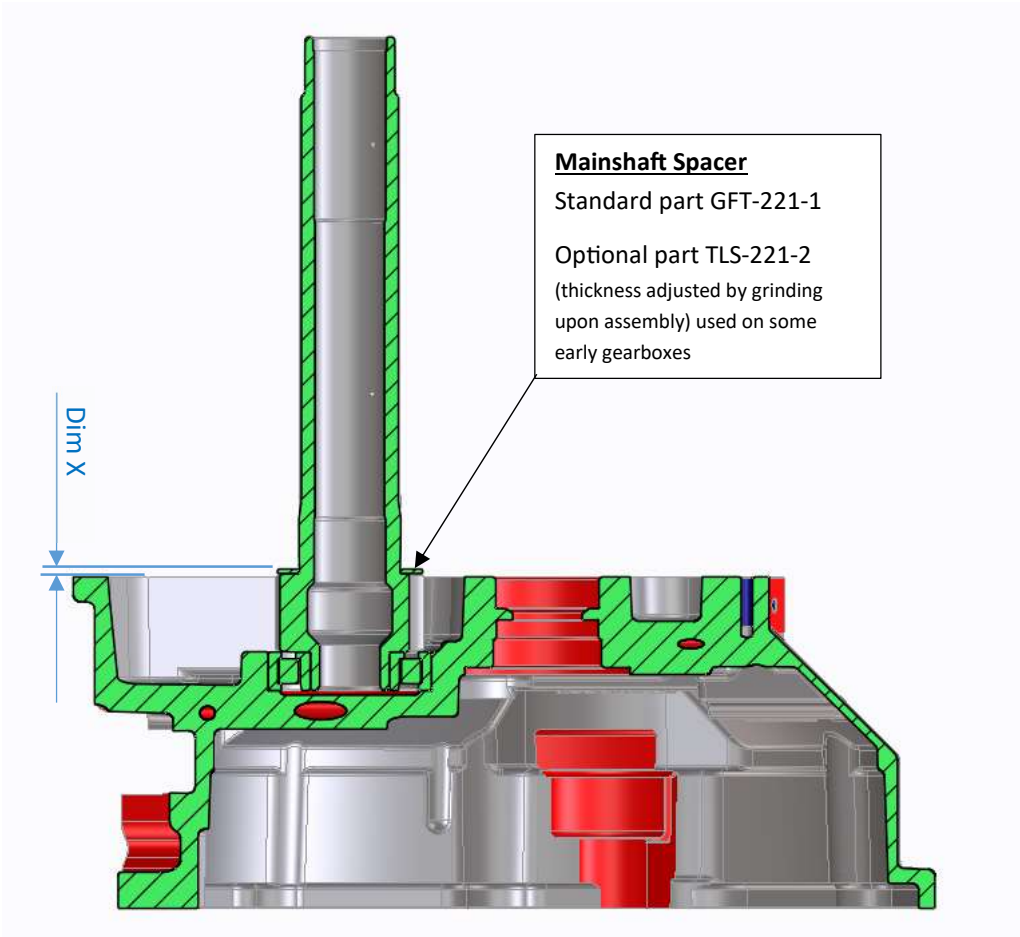


TLS-221-2 SPACER ONLY

Standard spacer GFT-221-1 does not require grinding and is 2.0mm thick

Note:-

The requirement for a wider spacer only applies to some earlier gearboxes, however it is still very important to check Dim X prior to setting the mainshaft preload. Due to improvements to the design of the CFT gearbox, the use of TLS-221-2 spacer and the potential requirement to surface grind it upon assembly should not apply on any units supplied from 2021 onwards



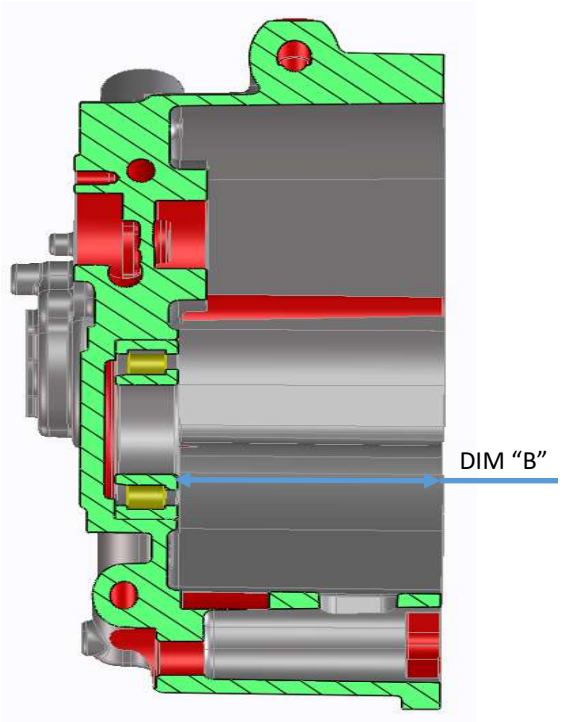
MAINSHAFT BEARING PRELOAD

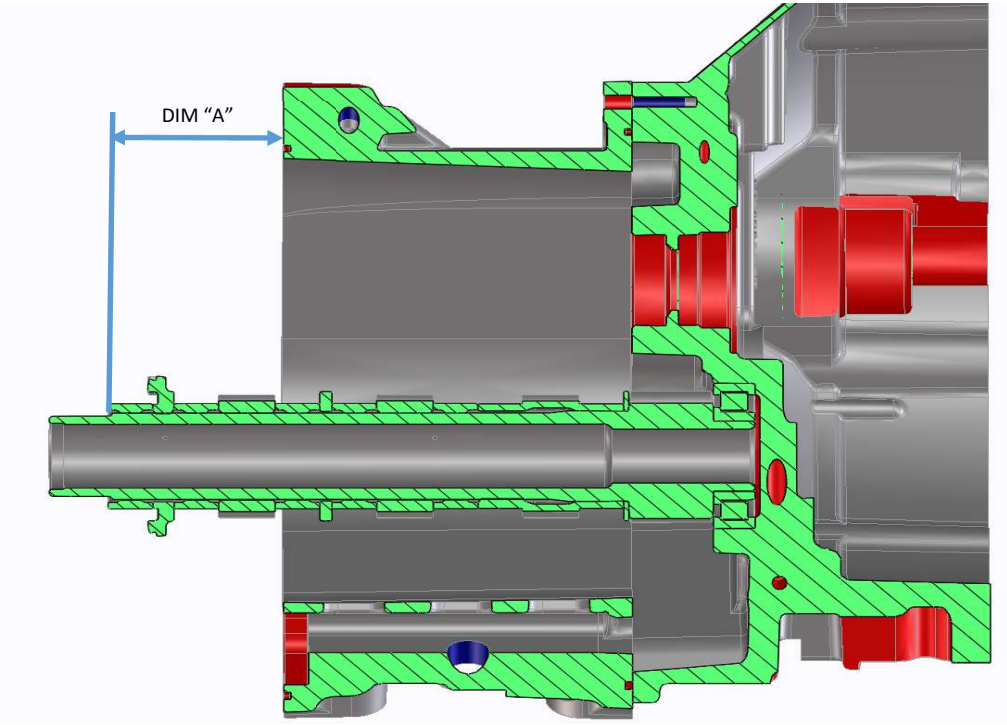
- Stand maincase (CFT-201) on its front face. Assemble central case (CFT-206) with bearing (BEA-099) fitted into the maincase ensure the bearing inner track is in position and slide mainshaft (GFTW-221-#P) inside it. Slide spacer (GFT-221-1), hubs (GFTW-226, GFTW-227 and GFTW-228) and Reverse dog ring GFTW-231-1 onto mainshaft in the orientation shown below. Measure from split face to edge of the reverse inner track. This is DIM A.
- Assemble layshaft bearing (BEA-190) into bearing carrier (GFT-202) and then insert bearing inner track (BEA-184). Measure from split face to the inner track. This is DIM B.
- To calculate the thickness of the pre-load spacer (GFTW-221-2) use the following formulas:

DIM B — DIM A = Gap

Gap + 0.050mm (0.002”) = Spacer thickness

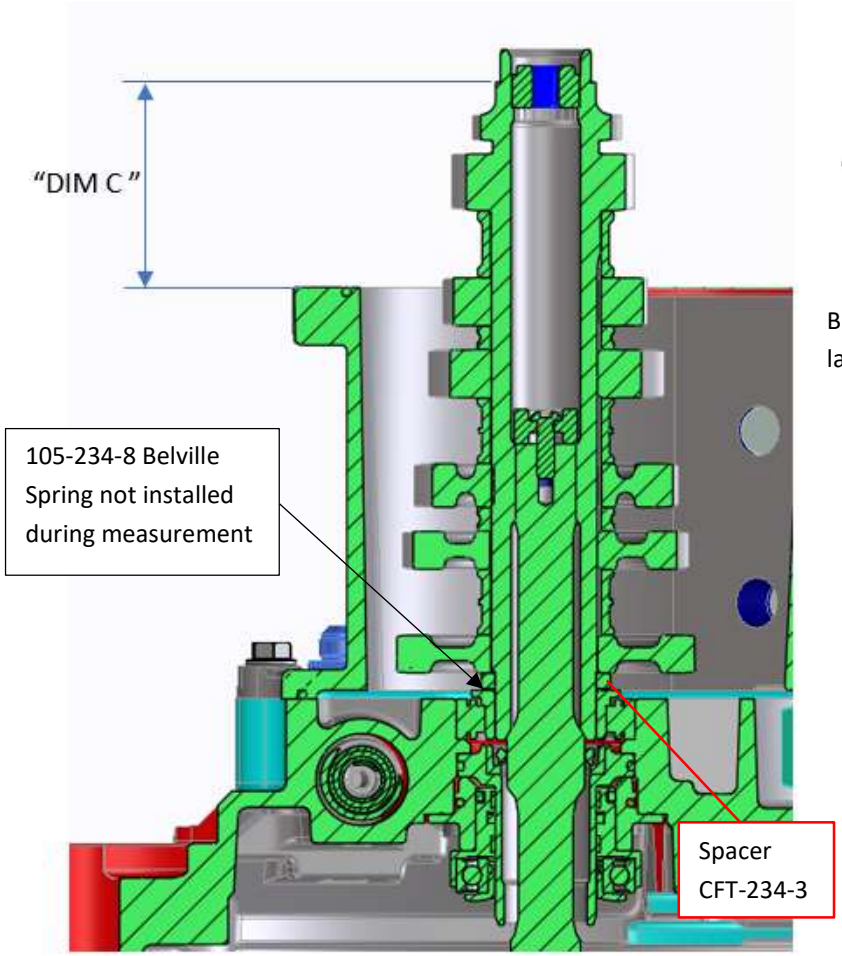
- Modify the pre-load spacer (GFTW-221-2 or alternative GFTW-221-2A) to the calculated size.
  Assemble the pre-load spacer into the layshaft assembly, as shown in the illustrated parts list.

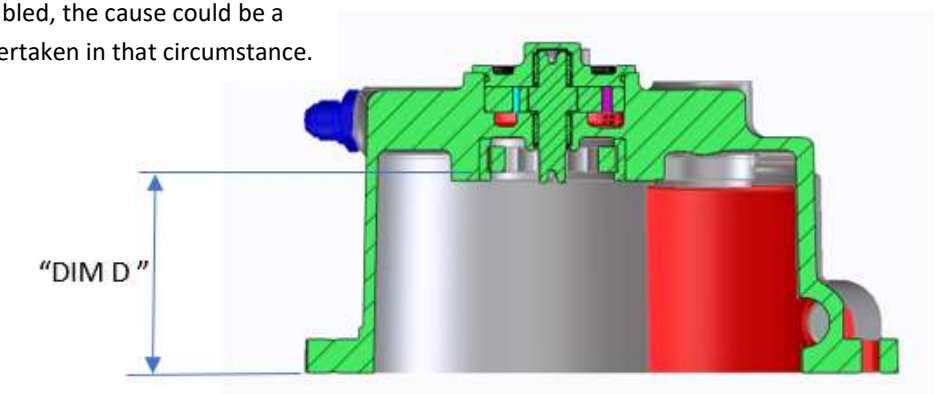




LAYSHAFT PRELOAD

Preload across the mainshaft should be set as detailed on the previous pages. The layshaft should not require setting, however if the gearbox doesn't turn over by hand once assembled, the cause could be a preloaded layshaft. This page details what checks, and actions should be undertaken in that circumstance.





Belville spring 105-234-8 is used to ensure layshaft stack doesn't float. To ensure that the layshaft isn't preloaded, the following check should be carried out.

- Measure height from centre case split-line to shoulder on layshaft (DIM C)
- Measure depth from bearing carrier split-line to end of bearing rollers (DIM D)

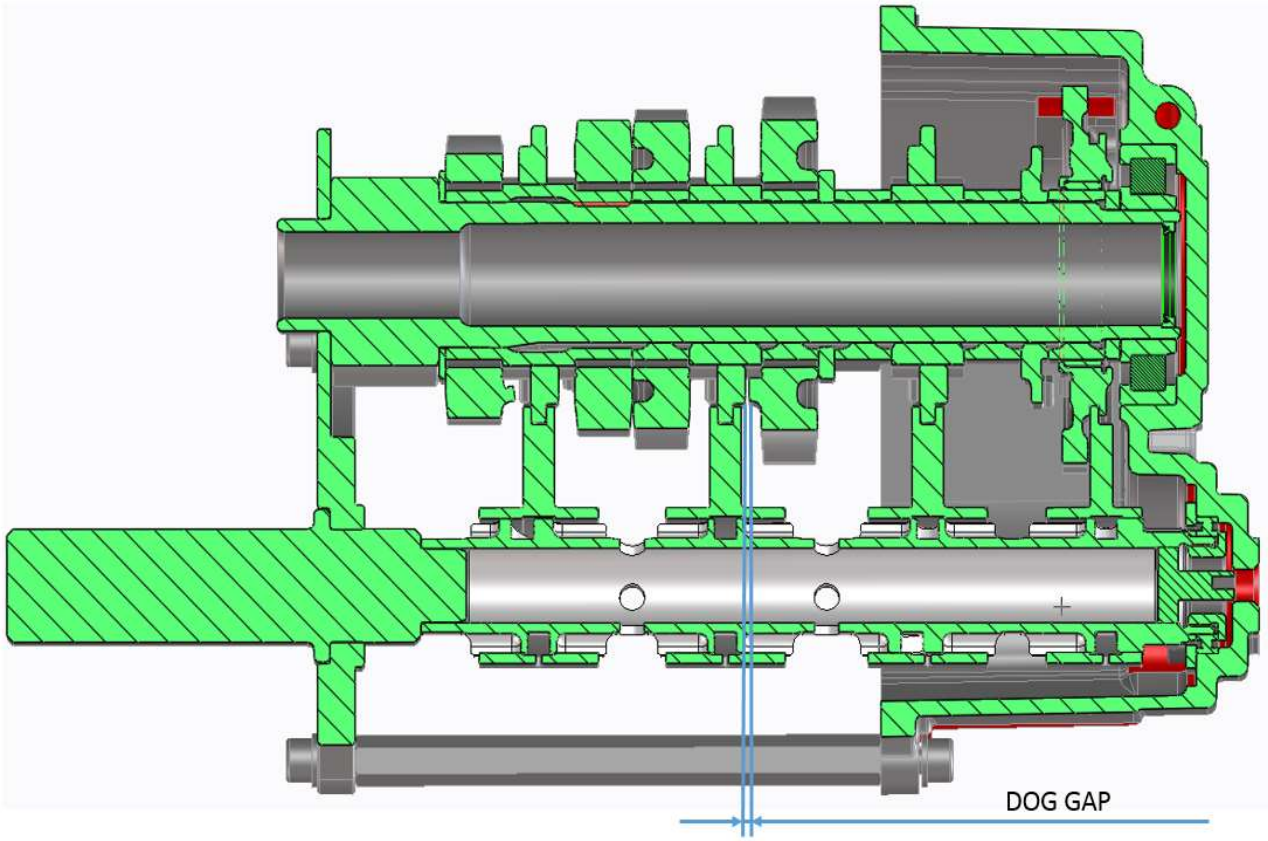
DIM D – DIM C = "spring gap"

- Measure thickness (T) and free height (FH) of 105-234-8 belville spring
- "Spring Gap" should be no smaller than T + 0.1mm
- Spacer CFT-234-3 can be surface ground as required to achieve this
- "Spring Gap" must not exceed FH – 0.1mm
- It is acceptable to fit 2x Belville spring (105-234-8) to achieve the above (when doing this, springs should be parallel, and 'T' and 'FH' measured across both springs

SEQUENTIAL BARREL SETTING

- Special tools required: **SK-3035**

- Assemble the barrel (GFTW-260), spacer (TE-260-7), bearing retaining plate (NMT-260-2), bearing (BEA-037), and nut (TE-260-5). Slide the barrel assembly into the bearing carrier, and secure using screws (TPT-244-13R).
- Assemble the dowel pin (F3A-202-9A), spring (PCT-260-3), spring trunnion (FTR-260-8), detent arm (PCT-260-13), washer (HP-M-7039) and retaining screw (HP-M-9054) into the bearing carrier.
- Slide the selector forks (GFTW-249 and GFTW-250) over the barrel (GFTW-260), locate using selector pins (GFTW-250-1) and secure in position using circlip (CIR-272).
- Stack the mainshaft assembly in place in the bearing carrier, including hubs, pinion gears, bearings and clutch rings.
- Assemble the fork setting fixture *SK-3035* onto the bearing carrier.
- Rotate the barrel to engage neutral position. Measure and record the gap between the dogfaces of third through sixth gears. First, third and fifth gear dog gap measurements will be similar (as will second, fourth and sixth). Any difference between the odd & even gear measurements must be corrected by replacing the barrel spacer (NMT-260-2) with one of the correct thickness.
- Note: Individual setting of each fork is not possible (and is not necessary)



CHANGING GEAR RATIOS

- With a drip tray placed beneath the gearbox, remove the magnetic drain plug (PLU-141) and drain the oil.
- Remove the M8 bolts (SCR-419) securing the bearing carrier (GFTW-202) and slide it away from the maincase, complete with the gear cluster. Never use a screwdriver to lever between joint faces as this may damage the faces and impair the seal efficiency when reassembled.

  Note: Only the barrel is fixed in the bearing carrier, care should be taken to ensure the complete gear cluster assembly is removed together.
- Withdraw the gear sets and hubs and clutch rings.
- Replace the gears with the required ratios. Gears are supplied in matched pairs, one for the mainshaft and one for the layshaft.
- Whilst changing ratios it is advisable, as a matter of course, to wash and inspect all components which are to be used again before refitting. Check for wear and cracks, particularly to the clutch rings. Also examine the selector forks for heavy or uneven wear.

  Note: If any hubs are replaced, check the mainshaft preload as described on page 8 of this gearbox manual.
- Reassembly is the reverse of disassembly. Take care, when refitting the gear cluster into the maincase, to ensure location of the shafts in their bearings, and of the selector barrel and its driver.

  Note: It is sometimes necessary to slightly rotate either the gear cluster or the differential, to help with alignment.

Important note:

Do **NOT** use the screws to pull the casing in.

ROUTINE MAINTENANCE

This section is only intended to be a very basic list and maintenance should not be restricted to this.

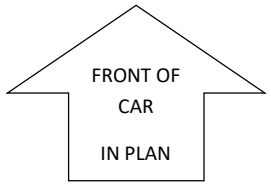
- Inspect and clean gearbox oil inline filter, suction filter and magnet.
- Inspect condition of lip-seals regularly for signs of overheating or damage to the sealing lips. If in doubt replace – particular attention should be paid to the input shaft seal.
- Inspect condition of bearings and bearing tracks.
- Inspect condition of gears, paying particular attention to gear teeth and signs of damage.
- Inspect the condition of the dogs on the clutch-rings and gear ratios.
- Inspect the condition of the tracks on the selector barrel.
- Check the barrel retaining plate is not bent by ensuring there is no gap between it and the mating face on the main casing. Use a feeler gauge to check this. This plate retains the selector barrel, so continued use could result in serious gearbox damage.
- This should be checked especially when dog damage has occurred.
- Inspect condition of selector forks, paying particular attention to the groove that the clutch-rings run in and the condition of the pin that runs in the barrel tracks. The pins in the forks can be replaced.
- Regularly check the selector barrel setting using the fork setting plate – especially when dog damage has occurred.
- Inspect the condition of the barrel driver, paying particular attention to the condition of the pins that are driven by the selector rack.
- Inspect the condition of the selector rack assembly, paying particular attention to the corners on the pawl that drive the barrel driver.
- Inspect the differential assembly. In particular check condition of differential bevel gears, ramps and plates.
- Inspect the condition of the oil pump. Check for damage and ensure it is smooth to turn over.

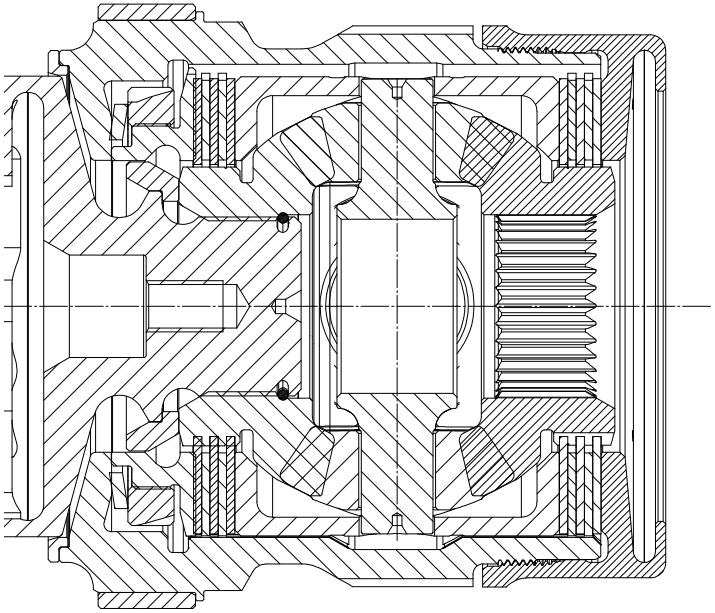
POWERFLOW DIFFERENTIAL

The Powerflow differential unit is designed with versatility as its major asset. Many factors will contribute to the settings required. A car with good traction and low power, may require a completely different arrangement to that of a car with poor traction and high power. There are 11 friction plates within the unit (5 splined to the diff casing, and 6 splined to the side bevel gears). Slip limiting is dependent on the friction resistance between these plates, and is affected by clamping the plates together.

The three main factors that alter the locking characteristics of the diff are:

- Ramp angle
- Number of friction surfaces utilised in the plate stack
- Pre-load





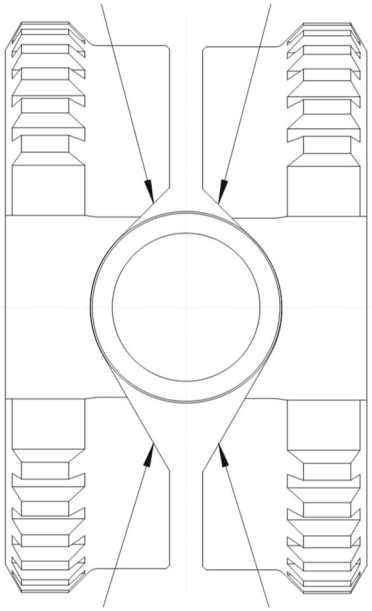
The ramp angle cut into the side ring gears has a direct effect on how much of the torque transmitted to the diff is converted into thrust force on the plates. For example a 45° ramp transmits less sideways force than a 30° ramp. The drive and coast ramp set can simply be swapped over by inverting it in the diff cases.

To alter the number of friction surfaces, simply re-order the plate stack to change the number of relatively rotating faces. The diagram in the illustrated parts list uses the maximum number of friction faces.

The pre-load depends on how tightly the plate stack is compressed on assembly. The preload can be set be tightening the diff cap to set positions. The gap between the diff cap and case relate to the amount of preload on the diff.

When the diff is assembled the pre-load torque must be at least 10 Nm, but can be greater if required. New plates ‘run-in’ and lose pre-load quickly when they are bedding in, so it advisable to use a higher pre-load than with ‘used’ plates. See front of the manual for differential values.

Coast ramps



Drive ramps

ILLUSTRATED PARTS LIST

PARTS TABLE

Position No	Name	Description	Quantity
1	102-260-9	COMPRESSION SPRING	1
2	105-234-8	DISC SPRING	1
3	306-06-M14D	ADAPTOR	2
4	314-31P	PLUG	1
5	314-M12D	PLUG	1
6	400-222-4490-41	DOWTY WASHER	2
7	400-868-4490-41	DOWTY WASHER	2
8	SCR-349	ANTI ROTATION PIN (M8)	1
9	BEA-037	BALL BEARING	1
10	SHL-260-1	BARREL DRIVER	1
11	BEA-001	ROLLER BEARING	1
12	BEA-035	NEEDLE ROLLER BEARING	2
13	BEA-073	ROLLER BEARING	1
14	BEA-099	ROLLER BEARING	1
15	BEA-107	BALL BEARING	2
16	BEA-377	BALL BEARING	1
17	BEA-412	BALL BEARING	1
18	BEA-511	NEEDLE BEARING	6
19	BEA-571	BALL BEARING	2
20	BEA-617	THRUST WASHER	2
21	BEA-619	SUPPORT RING	2
22	BEA-093	ROLLER BEARING	1
23	TE-234-2	BEARING INNER TRACK	1
24	ELC-036	OIL TEMP SENSOR	1
25	CFT-201	MAINCASE	1
26	CFT-201-2	SPRAY RAIL	1
27	CFT-202	BEARING CARRIER	1
28	CFT-202-1	OIL TRANSFER BLOCK	1
29	CFT-206	CENTRAL CASE	1
30	CFT-206-1	SPRAY RAIL	1
31	CFT-206-2	REV. IDLER PLATE	1
32	*CFT-237-2* **CFT-237-2S**	*REV. IDLER SPIGOT (2019-2023)* **REV. IDLER SPIGOT (2023>)**	1
33	*CFT-239-1 / CFT-239-2* **CFT-239-3**	*CLUTCH SHAFT - (2019-2021) / (2021-2022)* **CLUTCH SHAFT (2022>)**	1

PARTS TABLE

Position No	Name	Description	Quantity
34	CFT-258-1	PISTON SUPPORT	1
35	CFT-258-2	PISTON	1
36	CFT-258-3	NOSE PIECE	1
37	CFT-258-4	HOUSING	1
38	CFT-260-5	RACK SPACER	2
39	CIR-110	CIRCLIP	1
40	CIR-183	CIRCLIP	1
41	CIR-271	SPIRAL CIRCLIP	1
42	CIR-272	*E-CLIP (2019-2021 Builds ONLY)*	4
43	CIR-273	SPIRAL CIRCLIP	1
44	SPR-057	COMPRESSION SPRING	1
45	DOW-024	DOWEL	1
47	DOW-040	DOWEL	4
48	DWT-201-1	BEARING SLEEVE	1
49	EVT-265-4	PUMP ROTOR INNER	1
50	EVT-265-5	PUMP ROTOR OUTER	1
51	F3A-202-9A	DOWEL	1
52	FT-244-11	LIP SEAL	1
53	FTR-260-4	SELECTOR RACK WASHER	2
54	FTR-260-8	SPRING TRUNION	1
55	GFT-221-1	MAINSHAFT SPACER	1
56	GFT-265-1	OIL PUMP COVER	1
57	GFT-265-3	OIL PUMP DRIVE	1
59	GFTW-208	DIFF END COVER	1
60	*GFTW-212* *CFT-212* **CFT-212-MK2**	*DIFF ASSY (2019-2021)* *DIFF ASSY (2022-2023) CFT-200-003 only – CFT-200-003A is supplied without this assembly* **PART OF DIFF ASSY (2024> SPEC FOR CFT-200-004)**	1
61	GFTW-221-1	MAINSHAFT SPACER	1
62	GFTW-221-RATIO	FINAL DRIVE RATIO	1
63	GFTW-221-2	MAIN SHAFT SPACER	1
64	GFTW-226	HUB	1
65	GFTW-227	HUB	2
66	GFTW-228	BEARING INNER	5
67	*GFTW-231* **LGT-231**	*REVERSE PINION GEAR* **REV. PINION GEAR (2024> SPEC CFT-200-004)**	1

PARTS TABLE

Position No	Name	Description	Quantity
68	GFTW-231-1 **LGT-231-1**	REVERSE CLUTCH RING **REV. CLUTCH RING (2024> SPEC CFT-200-004)**	 1
69	GFTW-237-1	REVERSE IDLER GEAR	1
70	GFTW-249	REVERSE FORK	1
71	GFTW-250	SELECTOR FORK	3
72	GFTW-250-1	SELECTOR FOK PIN	4
73	GFTW-260	BARREL ASSY	1
74	HC-237-2	NEEDLE ROLLER BEARING	1
75	HP-M-7039	DRUM WASHER	1
76	HP-M-9037	BANJO JOINT (3/8 UNF)	1
77	HP-M-9038	SEALING WASHER	2
78	HP-M-9039	BANJO BOLT	1
79	HP-M-9042	DOWTY WASHER	6
80	HP-M-9054	SOCKET CAP SCREW - (M6x30mm)	1
81	HYD-067	ADAPTOR	2
82	HYD-072	ADAPTOR	2
83	NMT-260-2	KEEP PLATE	1
84	104-234-4	LAYSHAFT SPACER	1
85	LIP-046	LIP SEAL	1
86	LIP-145	LIP SEAL	1
87	DOW-089	DOWEL	1
88	CFT-RATIO-INT	INTEGRAL 1ST LAYSHAFT	1
89	MLI-232	CLUTCH RING	3
90	104-226-2	NEEDLE ROLLER BEARING	1
91	ORI-202	O-RING	1
92	LIP-019	LIP SEAL	1
93	ORI-001	O-RING	2
94	ORI-029	O-RING	1
95	ORI-072	O-RING	1
96	ORI-153	O-RING	2
97	ORI-171	O-RING	1
98	ORI-204	O-RING	1
99	ORI-301	ROD SEAL	1
100	ORI-302	ROD SEAL	1
101	ORI-303	ORING	2

PARTS TABLE

Position No	Name	Description	Quantity
102	SPH1077-M3	PAWL	1
103	PCT-260-13	DRUM STOPPER	1
104	PCT-260-3	COIL SPRING	1
105	PLU-137	PORT PLUG	4
106	PLU-141	MAGNETIC DRAIN PLUG	1
107	SPH1078-M3	PLUNGER	1
108	CFT-260-4	PLUNGER SLEEVE	1
109	PNU-136	ACTUATOR ASSEMBLY	1
111	SCR-022	SOCKET CAP SCREW	2
112	SCR-080-SS	SOCKET BUTTON HEAD SCREW	1
113	SCR-092	SOCKET CAP SCREW	3
114	SCR-129	SOCKET CAP SCREW (M6X12)	5
115	SCR-419	M8x30MM	19
116	SCR-423	M6x16MM	5
117	SCR-455-SS	BUTTON CAP SCREW	2
118	SCR-456-SS	BUTTON CAP SCREW	4
119	TE-260-5	SELECTOR BARREL BOLT	1
120	TE-260-7	SELECTOR BARREL SPACER	1
121	CFT-260-3	SELECTOR RACK	1
122	SGT-244-13	SOCKET CAP SCREW (M6X16)	4
123	SCR-143	SOCKET CAP SCREW	1
124	SCR-107	SOCKET SET SCREW	1
125	TE-266	OIL FILTER	1
126	FTR-260-5	SLEEVE	1
127	VG-201-9	SEALING STRIP	2
128	WSH-003	WASHER	3
129	WSH-028	WASHER - (M8)	1
130	WSH-065	DOWTY WASHER	2
131	WSH-090	DOWTY WASHER	7
132	ELC-030-W	GEAR POT	1
133	CFT-RATIO-H	RATIO (H) - 5^{th} & 6^{th} Gears	2
134	CFT-RATIO-L	RATIO (L) - 2^{nd} & 3^{rd} Gears	2
135	CFT-RATIO-M	RATIO (M) - 4^{th} Gear	1
136	CFT-234-1	LAYSHAFT SPACER	2

PARTS TABLE

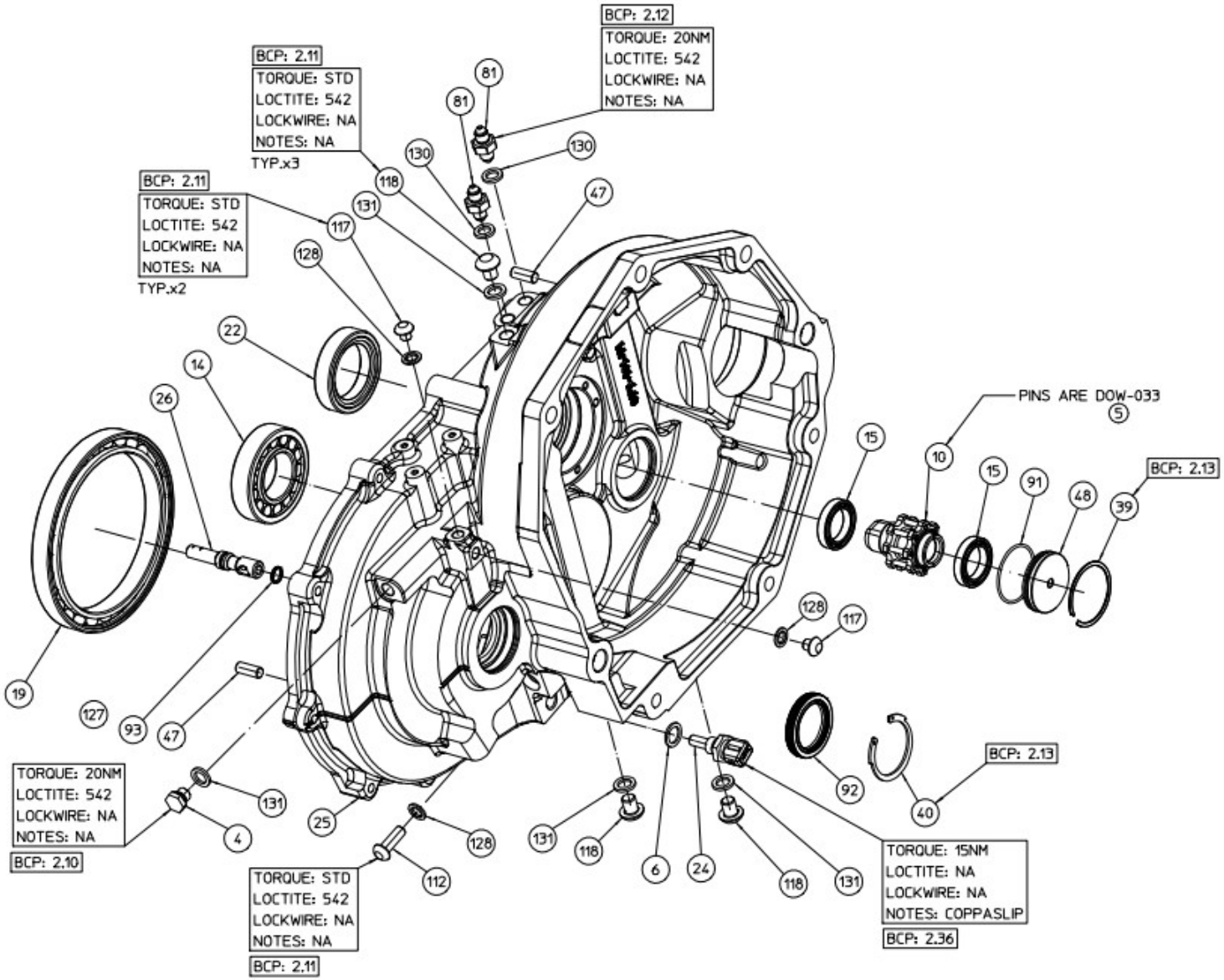
Position No	Name	Description	Quantity
137	CFT-234-2	LAYSHAFT SPACER	2
138	CFT-234-3	LAYSHAFT SPACER	1
139	240-040	WASHER	2
140	CFT-218-S	TRIPOD HOUSING (SUPPLIED LOOSE - **CFT-200-003A ONLY**.)	1
141	CIR-052	WIRE RING (SUPPLIED LOOSE - **CFT-200-003A ONLY**.)	1

NOTE:-

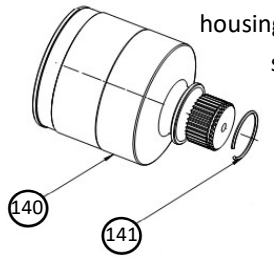
There are various kits available for servicing the CFT gearboxes. These are as follows:-

CFT-BEARING-KIT	Contains all bearings for 1x gearbox
CFT-FASTENER-KIT	Contains all screws, nuts, washers & circlips for 1x gearbox
CFT-GENERAL_SEAL-KIT	Contains all seals for 1x gearbox (excludes Slave Cylinder Seals)
CFT-SL_SEAL-KIT	Contains all seals for 1x slave cylinder assembly

MAINCASE

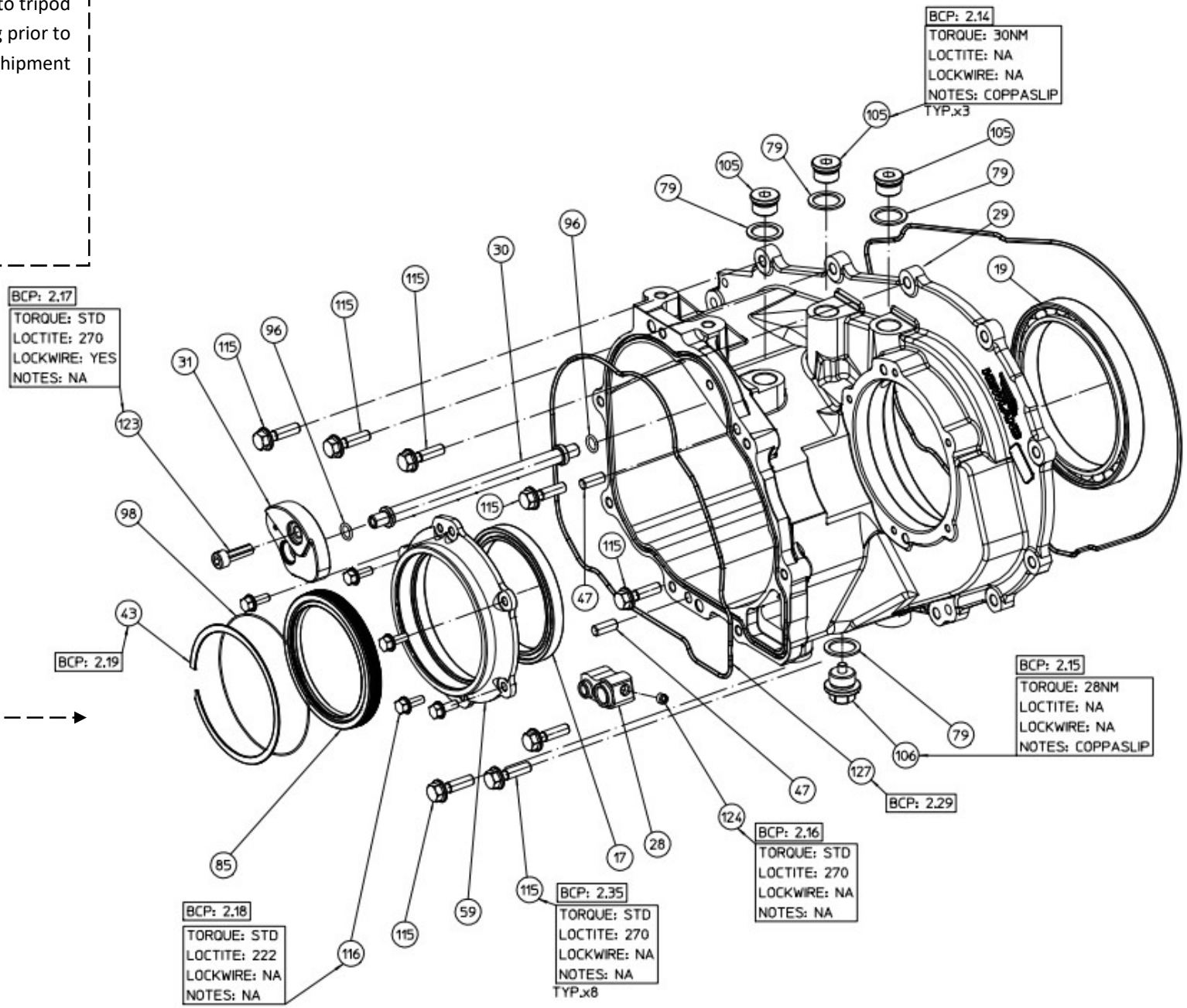


CENTRE CASE

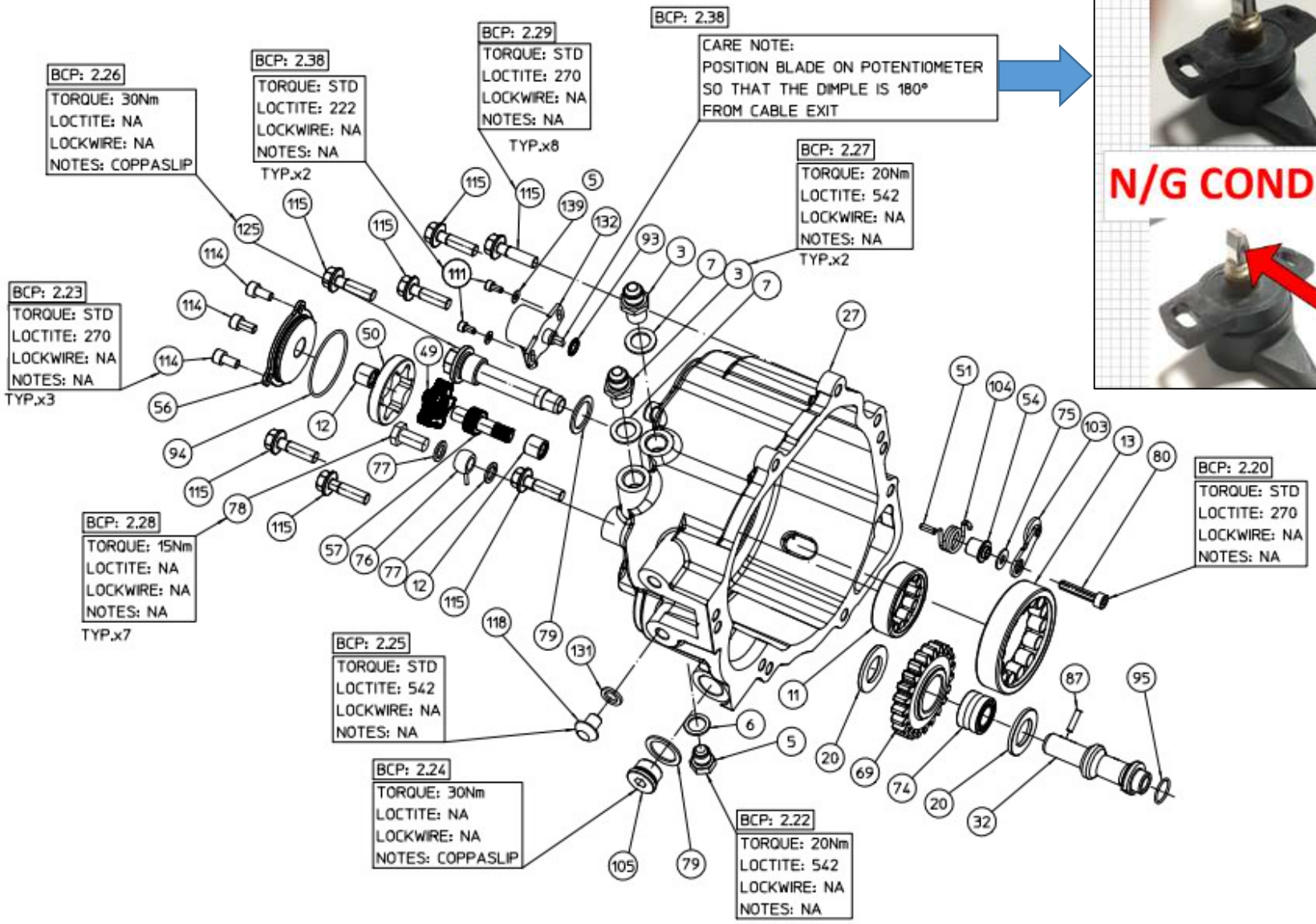


Fit snap ring to tripod housing prior to shipment

CFT-200-003A is supplied without a differential assembly, instead the above sub-assembly is to be supplied loose for customer to fit into their differential later.



BEARING CARRIER

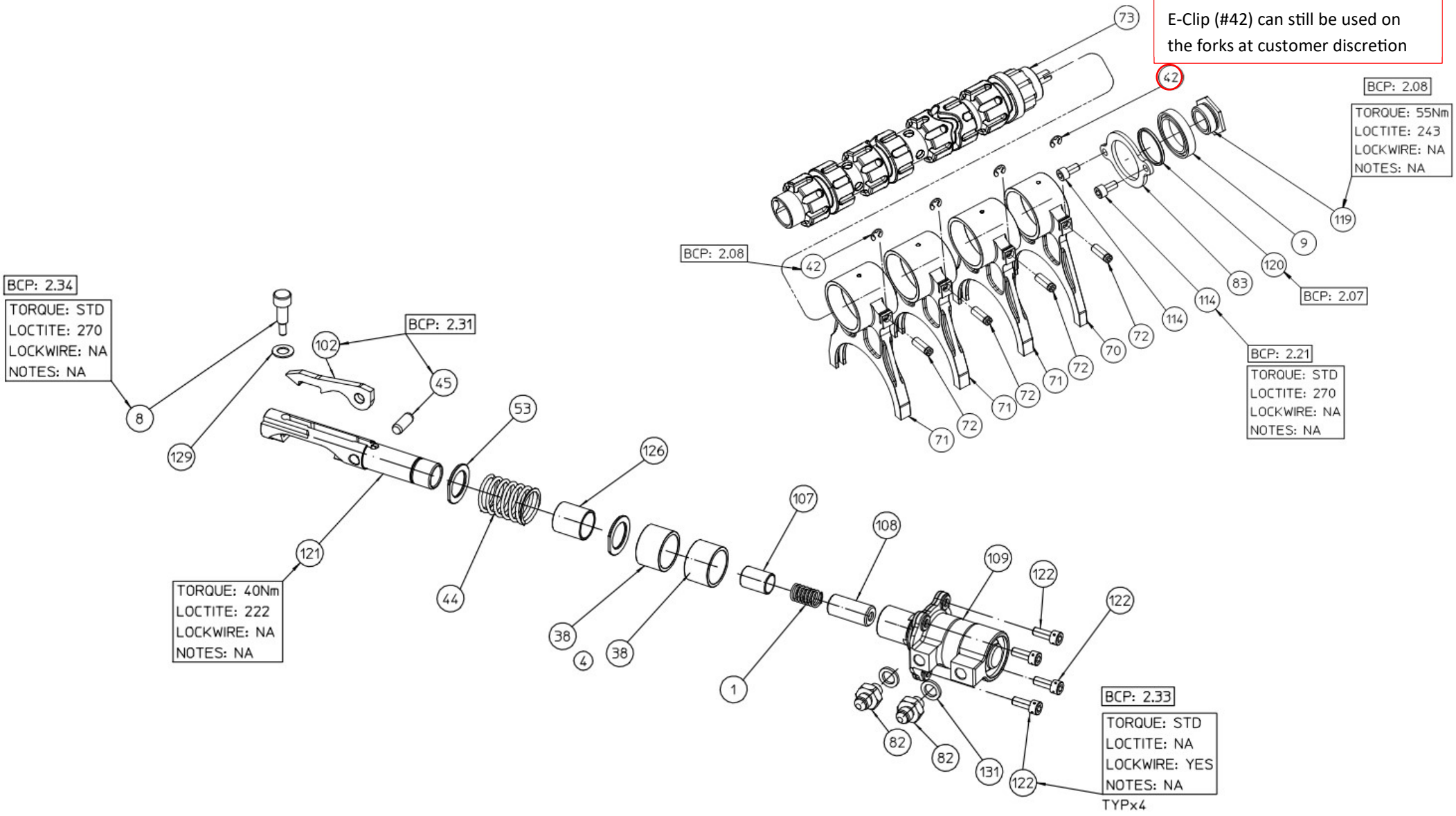


SELECTOR MECHANISM

(SHIFTER / FORKS / BARREL)

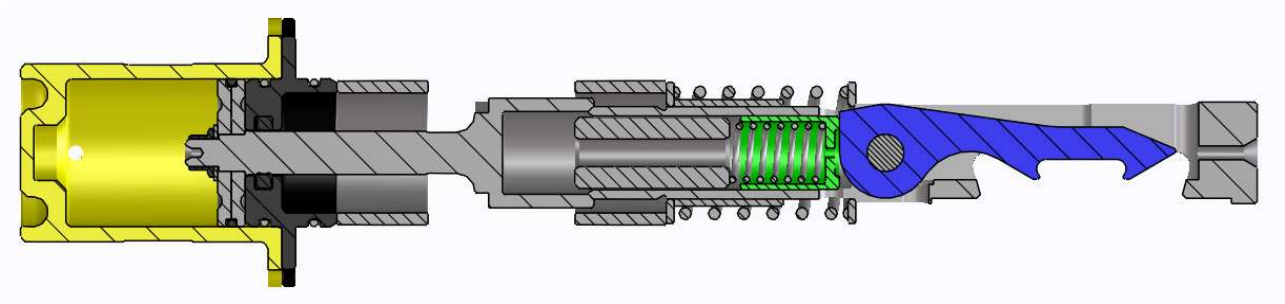
From 2019-2021 E-Clip (#42) was fitted. Gearboxes 2022> will be built with lockwire retaining the fork pin instead.

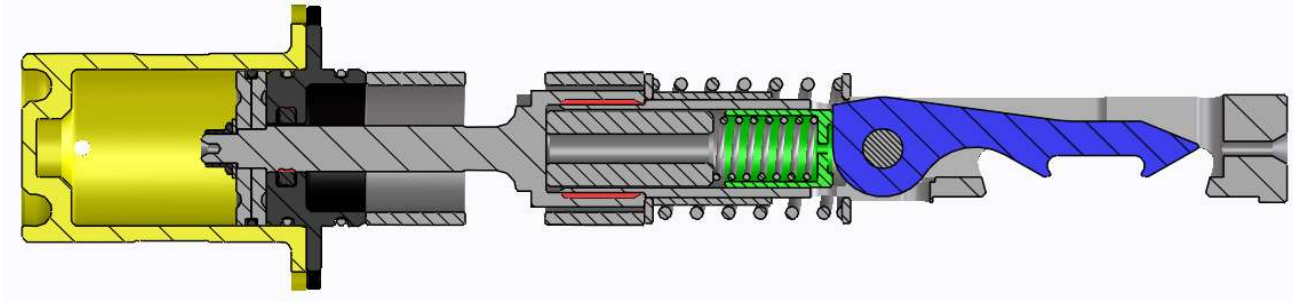
E-Clip (#42) can still be used on the forks at customer discretion

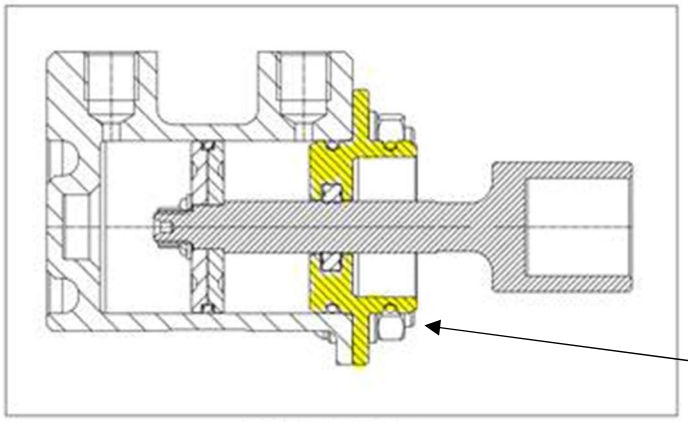


SHIFT ROD ASSEMBLY

In order to torque the piston rod (PNU-136-C) to the specified value the actuator must be in its extended position. Moving the two rack spacers (CFT-260-5) apart allows the piston rod to be threaded onto the selector rack (CFT-260-3), this is shown in figure 3 below. Thread the piston rod by hand, then torque the rack to the specified torque using a 15mm crow's foot. Make sure the crows foot is at 90°. Apply Loctite and torque to values specified.





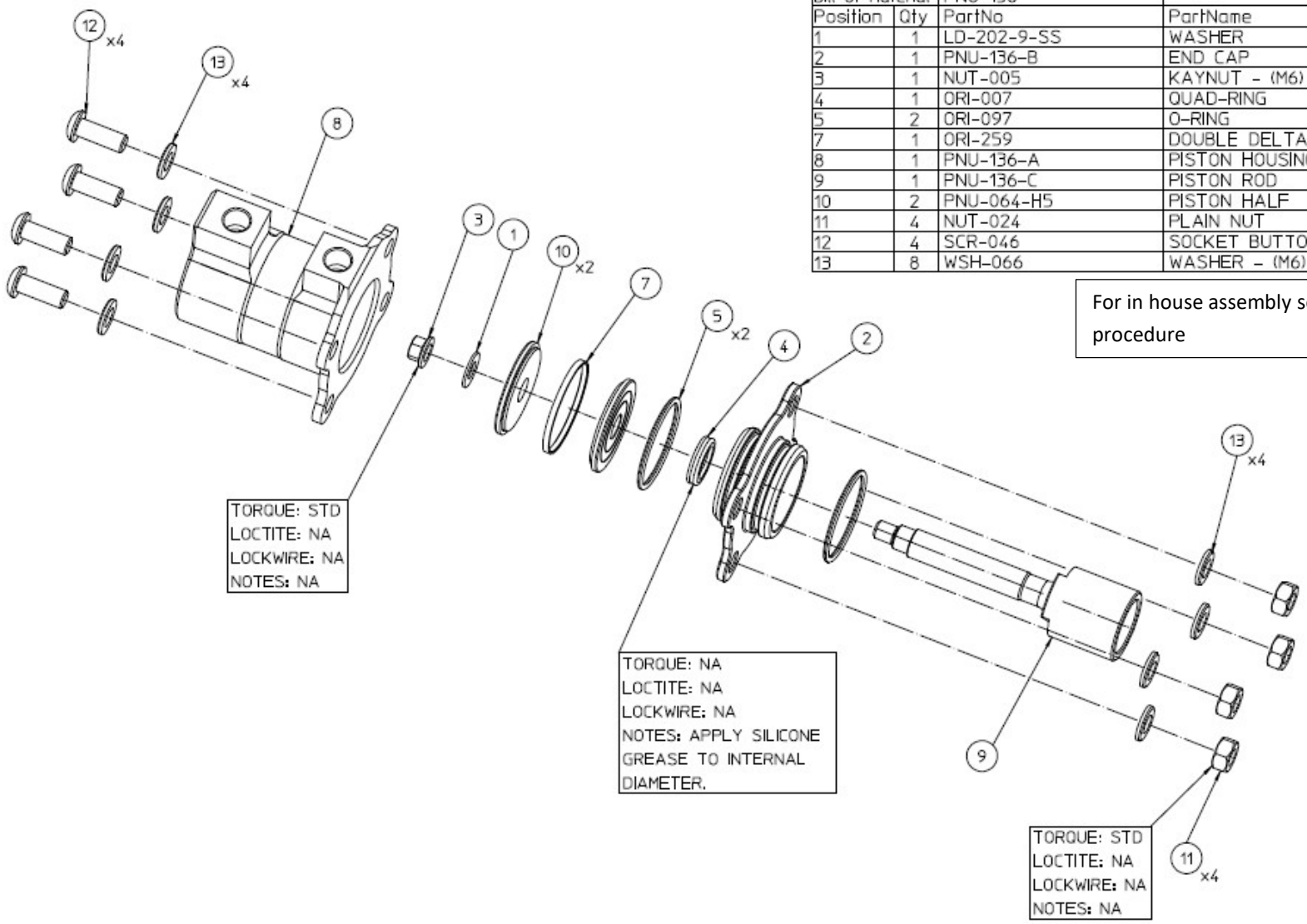


Note the correct orientation of PNU-136-B end cap. Fitting the cap around the wrong way will cause a positional error of the selector rack and will result in incorrect shift stroke as well as potential air leaks

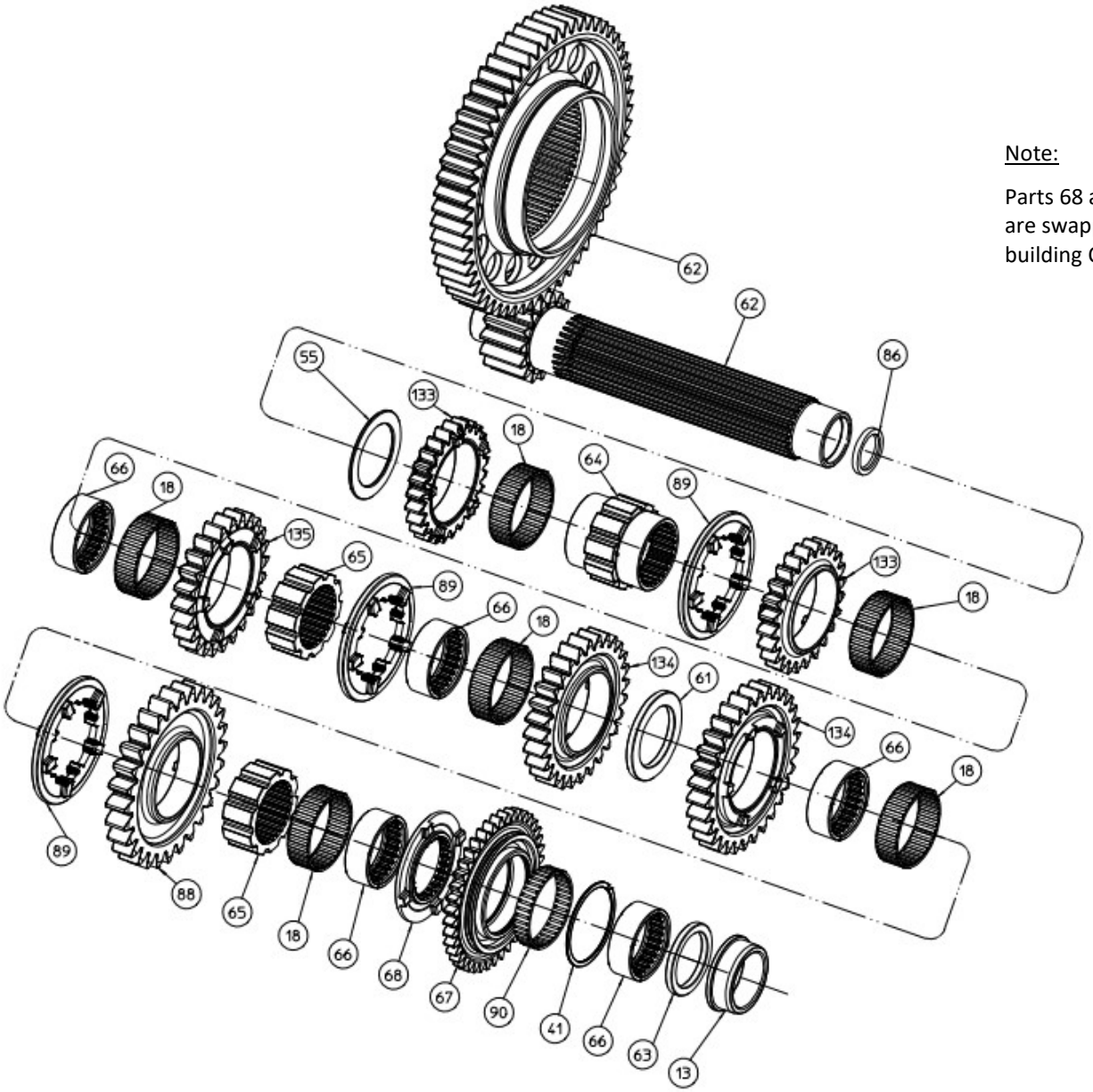
SHIFTER ACTUATOR

Bill of Material	PNU-136	
Position	Qty	PartNo	PartName
1	1	LD-202-9-SS	WASHER
2	1	PNU-136-B	END CAP
3	1	NUT-005	KAYNUT - (M6)
4	1	ORI-007	QUAD-RING
5	2	ORI-097	O-RING
7	1	ORI-259	DOUBLE DELTA O-RING
8	1	PNU-136-A	PISTON HOUSING
9	1	PNU-136-C	PISTON ROD
10	2	PNU-064-H5	PISTON HALF
11	4	NUT-024	PLAIN NUT
12	4	SCR-046	SOCKET BUTTON HEAD SCREW (M6)
13	8	WSH-066	WASHER - (M6)

For in house assembly see drawing for test procedure



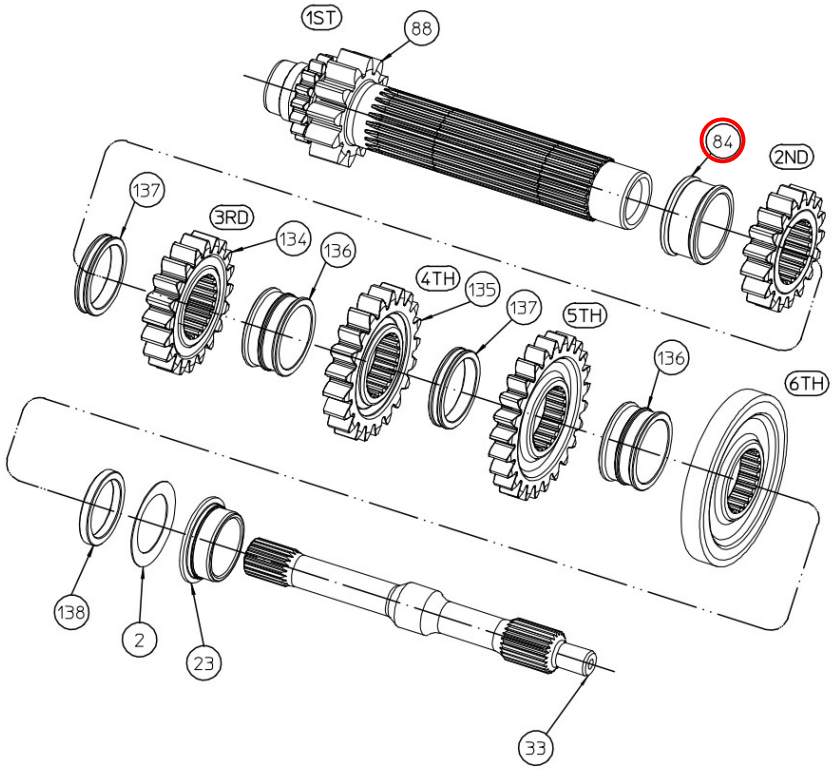
MAINSHAFT

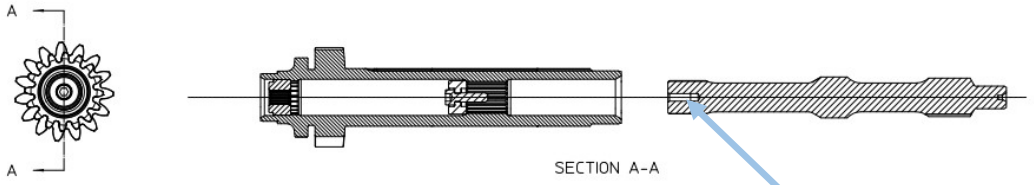


Note:

Parts 68 and 67 (GFTW-231 and GFTW-231-1) are swapped for LGT-231 and LGT-231-1 if building CFT-200-004 (2024 spec)

LAYSHAFT / CLUTCHSHAFT





Assembly Note:

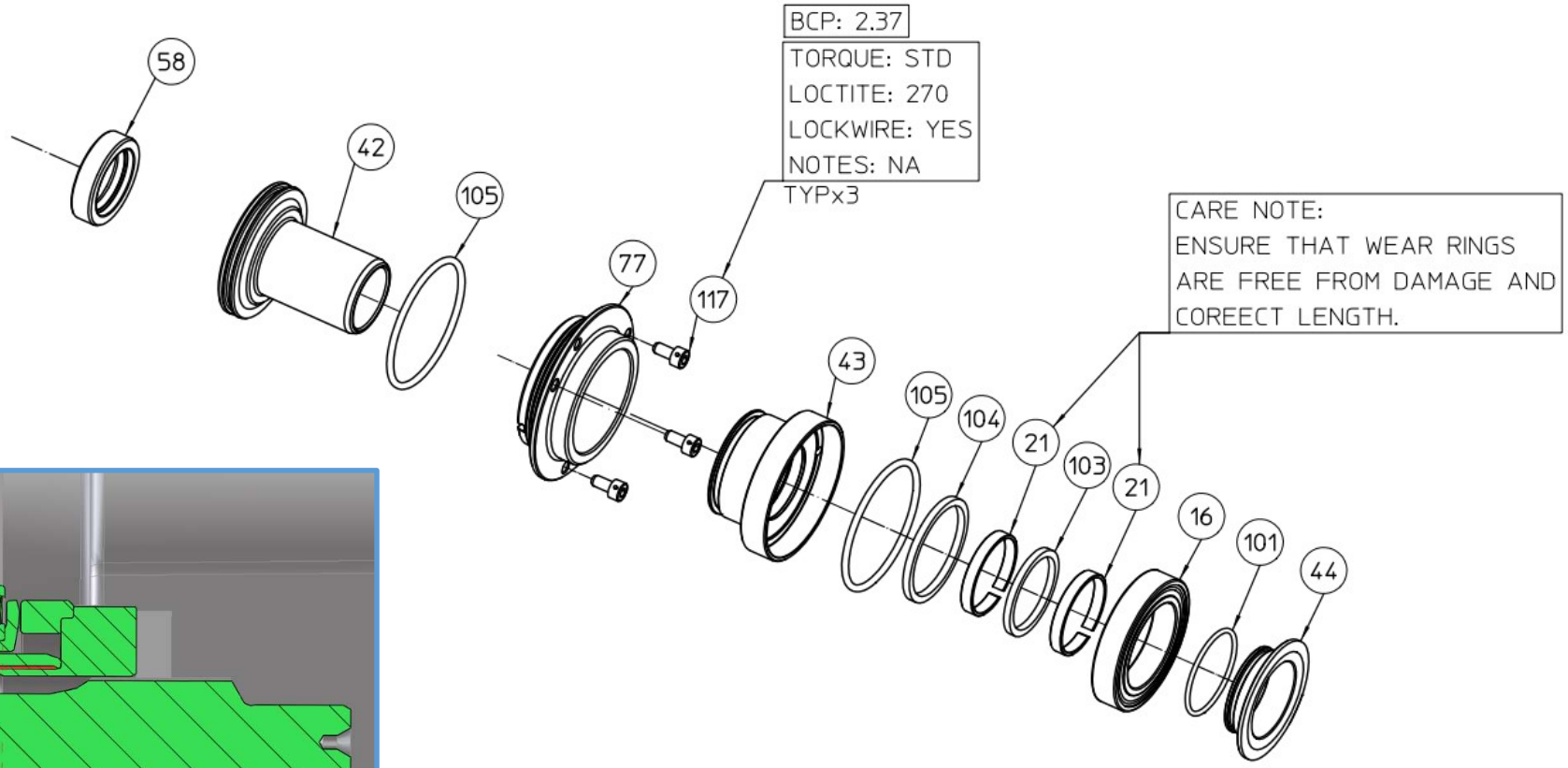
Part 84 (104-234-4) is **anodised red.** Part 136 (CFT-234-1) is similar in length to part 84 but is not anodised and has a small rib.

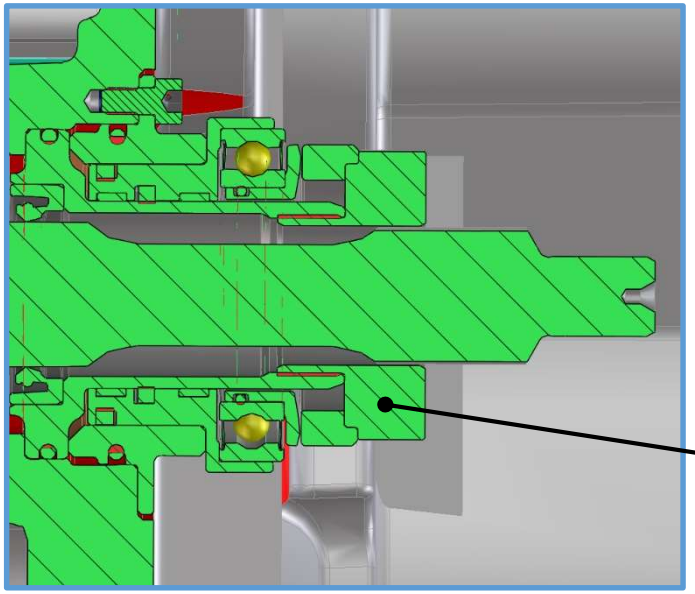
APPLY LOCTITE 222 TO THE CLUTCHSHAFT INTERNAL THREAD

SLAVE CYLINDER

NOTE:-

The Slave Cylinder shown here can be ordered as a sub-assembly (part Number CFT-258)

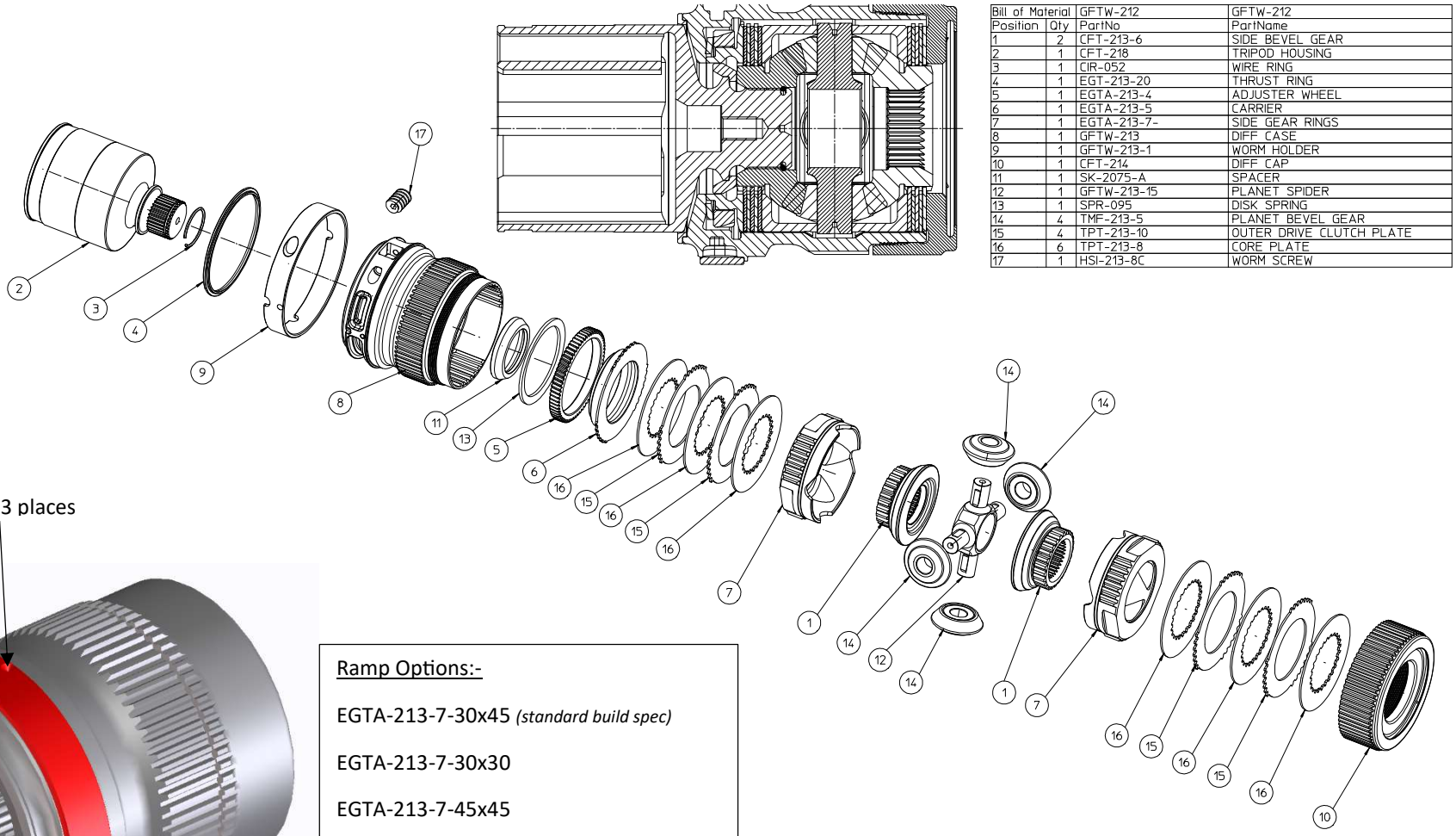




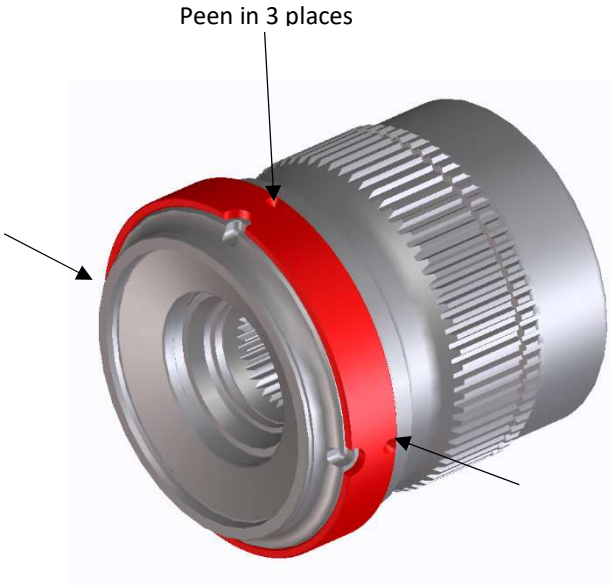
USE SPECIAL TOOL **SK-3139** FOR REMOVING SLAVE CYLINDER AS ONE PIECE

DIFFERENTIAL ASSEMBLY

GFTW-212-001 Specification (2019-2021)



Bill of Material		GFTW-212	GFTW-212
Position	Qty	PartNo	PartName
1	2	CFT-213-6	SIDE BEVEL GEAR
2	1	CFT-218	TRIPOD HOUSING
3	1	CIR-052	WIRE RING
4	1	EGT-213-20	THRUST RING
5	1	EGTA-213-4	ADJUSTER WHEEL
6	1	EGTA-213-5	CARRIER
7	1	EGTA-213-7-	SIDE GEAR RINGS
8	1	GFTW-213	DIFF CASE
9	1	GFTW-213-1	WORM HOLDER
10	1	CFT-214	DIFF CAP
11	1	SK-2075-A	SPACER
12	1	GFTW-213-15	PLANET SPIDER
13	1	SPR-095	DISK SPRING
14	4	TMF-213-5	PLANET BEVEL GEAR
15	4	TPT-213-10	OUTER DRIVE CLUTCH PLATE
16	6	TPT-213-8	CORE PLATE
17	1	HSI-213-8C	WORM SCREW



Ramp Options:-

EGTA-213-7-30x45 *(standard build spec)*

EGTA-213-7-30x30

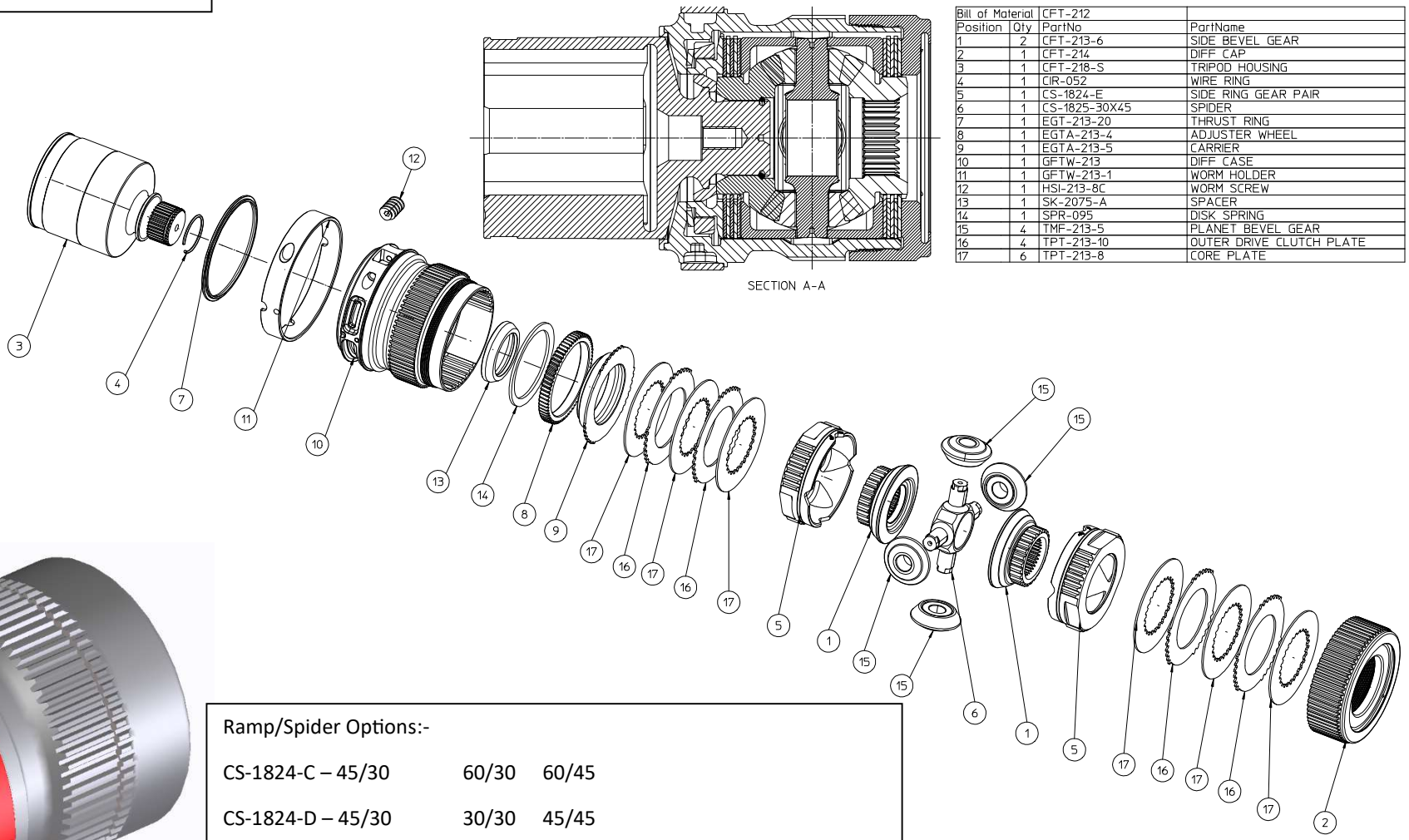
EGTA-213-7-45x45

EGTA-213-7-45x60

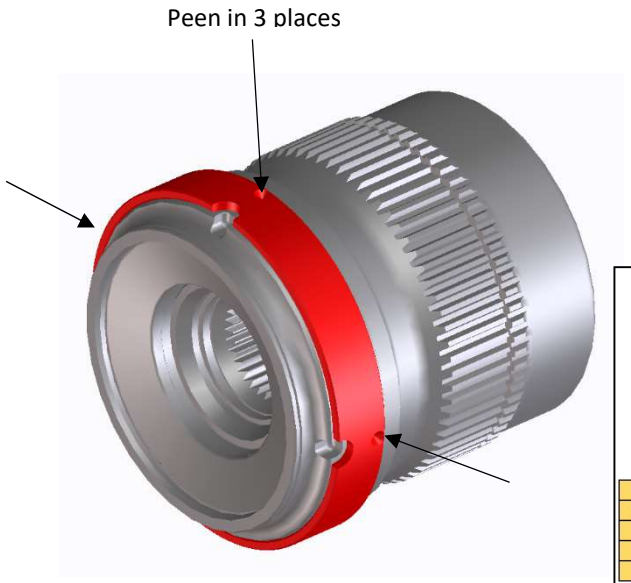
Note that these are all reversible, so, for example 30x45 can be run as 30° Drive and 45° Coast or 45° Drive and 30° Coast

DIFFERENTIAL ASSEMBLY CONT.

CFT-212-001 Specification (2022-2023)



Bill of Material	CFT-212	
Position	Qty	PartNo	PartName
1	2	CFT-213-6	SIDE BEVEL GEAR
2	1	CFT-214	DIFF CAP
3	1	CFT-218-S	TRIPOD HOUSING
4	1	CIR-052	WIRE RING
5	1	CS-1824-E	SIDE RING GEAR PAIR
6	1	CS-1825-30X45	SPIDER
7	1	EGT-213-20	THRUST RING
8	1	EGTA-213-4	ADJUSTER WHEEL
9	1	EGTA-213-5	CARRIER
10	1	GFTW-213	DIFF CASE
11	1	GFTW-213-1	WORM HOLDER
12	1	HSI-213-8C	WORM SCREW
13	1	SK-2075-A	SPACER
14	1	SPR-095	DISK SPRING
15	4	TMF-213-5	PLANET BEVEL GEAR
16	4	TPT-213-10	OUTER DRIVE CLUTCH PLATE
17	6	TPT-213-8	CORE PLATE



Ramp/Spider Options:-

CS-1824-C – 45/30 60/30 60/45

CS-1824-D – 45/30 30/30 45/45

CS-1824-E – 45/30 1 ANGLE ONLY (standard build spec.)

	Spider CS-1825-#	30/30	30/45	30/60	45/45	45/60
Ramps CS-1824-#						
C			X	X		X
D		X	X		X	
E			X			

Note that these ramp/spider sets are all reversable, so, for example 30x45 can be run as 30° Drive and 45° Coast or 45° Drive and 30° Coast

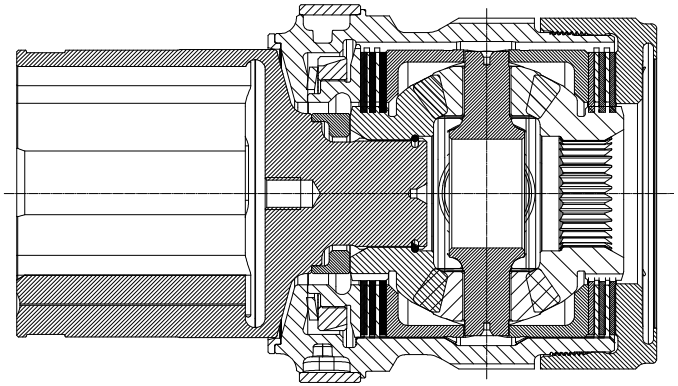
DIFFERENTIAL ASSEMBLY FOR CFT-212-MK2

Specification for 2024>

CFT-212-MK2 changes from CFT-212:

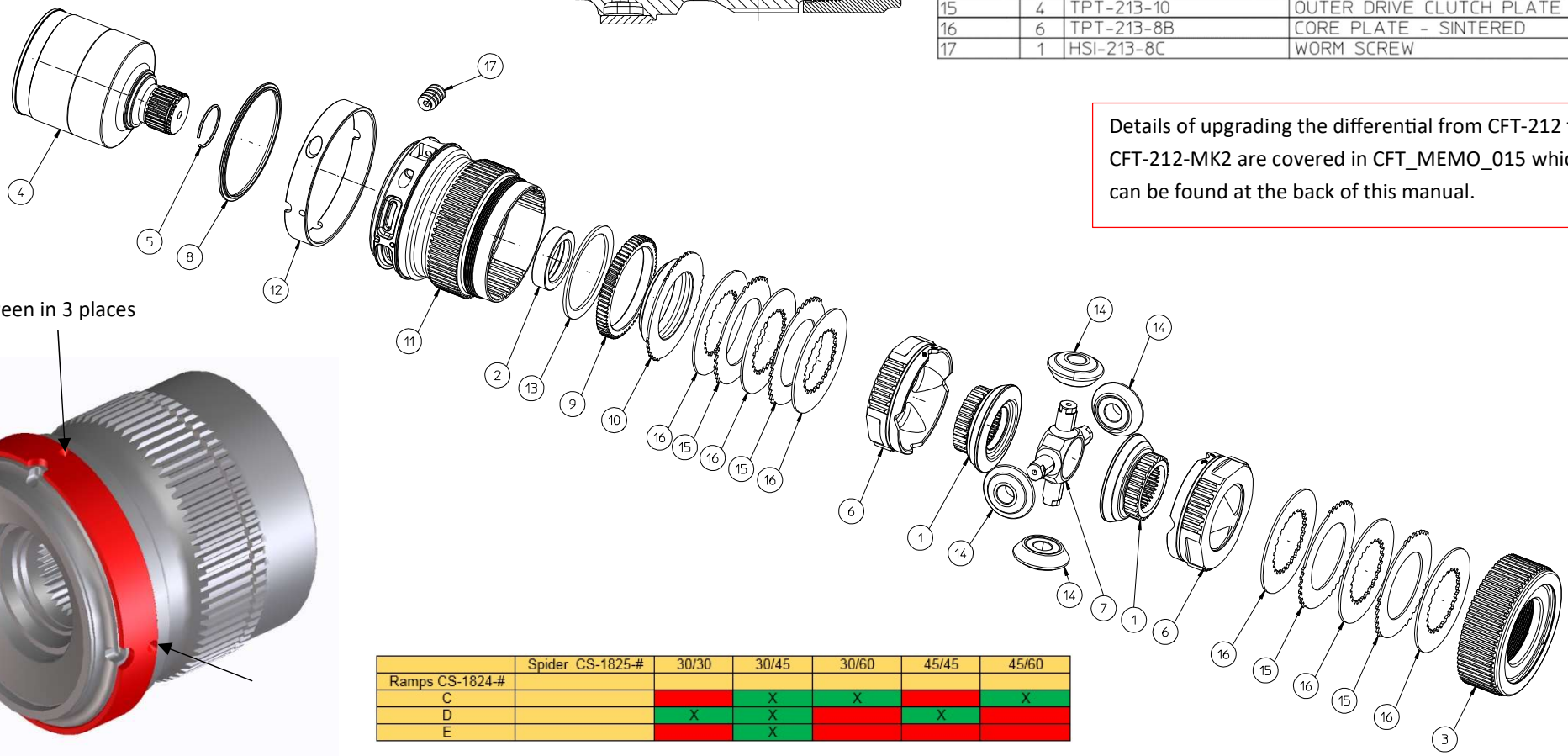
CFT-218-MK3 replaces CFT-218-S
(requires CFT-213-9 to replace SK-2075-A)

TPT-213-8B replaces TPT-213-8 (x6)
(requires CFT-214-A & EGTA-213-5A in place of CFT-214 & EGTA-213-5)



Bill of Material	CFT-212-MK2	CFT-212-MK2
Position	Qty	PartNo	PartName
1	2	CFT-213-6	SIDE BEVEL GEAR
2	1	CFT-213-9	SPACER FOR MK3 HOUSING
3	1	CFT-214-A	DIFF CAP
4	1	CFT-218-MK3	TRIPOD HOUSING MK3
5	1	CIR-052	WIRE RING
6	1	CS-1824-E	SIDE RING GEAR PAIR
7	1	CS-1825	SPIDER
8	1	EGT-213-20	THRUST RING
9	1	EGTA-213-4	ADJUSTER WHEEL
10	1	EGTA-213-5A	CARRIER
11	1	GFTW-213	DIFF CASE
12	1	GFTW-213-1	WORM HOLDER
13	1	SPR-095	DISK SPRING
14	4	TMF-213-5	PLANET BEVEL GEAR
15	4	TPT-213-10	OUTER DRIVE CLUTCH PLATE
16	6	TPT-213-8B	CORE PLATE - SINTERED
17	1	HSI-213-8C	WORM SCREW

Details of upgrading the differential from CFT-212 to CFT-212-MK2 are covered in CFT_MEMO_015 which can be found at the back of this manual.



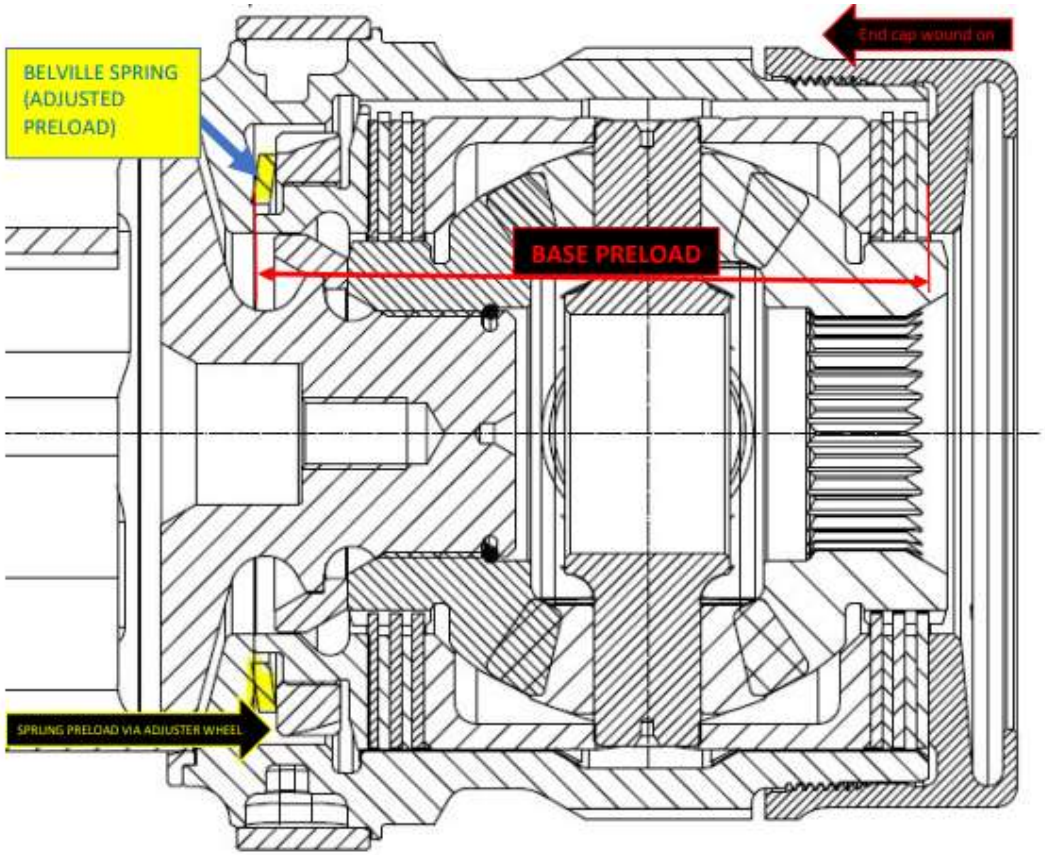
Peen in 3 places

	Spider CS-1825-#	30/30	30/45	30/60	45/45	45/60
Ramps CS-1824-#						
C			X	X		X
D		X	X		X	
E			X			

DIFFERENTIAL BUILD/SETUP GUIDELINES

Mechanical (BASE) preload

When setting the preload of the differential, it is essential that the plate stack is clamped and not allowed to float. To ensure that this cannot happen, mechanical preload must be set prior to any 'sprung preload' that is applied (via the worm wheel adjustment). This preload is the lowest achievable regardless of the adjuster and is referred to as BASE preload



The correct procedure when building/setting the differential is to first set a mechanical BASE preload. This is done with the adjuster wheel EGTA-213-4 fully wound-off to ensure that the Belville spring (SPR-095) not compressed at all. The differential cap CFT-214 should be screwed on fully and the torque-to-turn should be set to **at least 10Nm**. Note that it may be necessary to turn the cap further to ensure the splines align with the diff case so that the cartridge can be installed into the final drive wheel. Once a BASE preload has been set, additional preload can be wound on using the adjuster wheel.

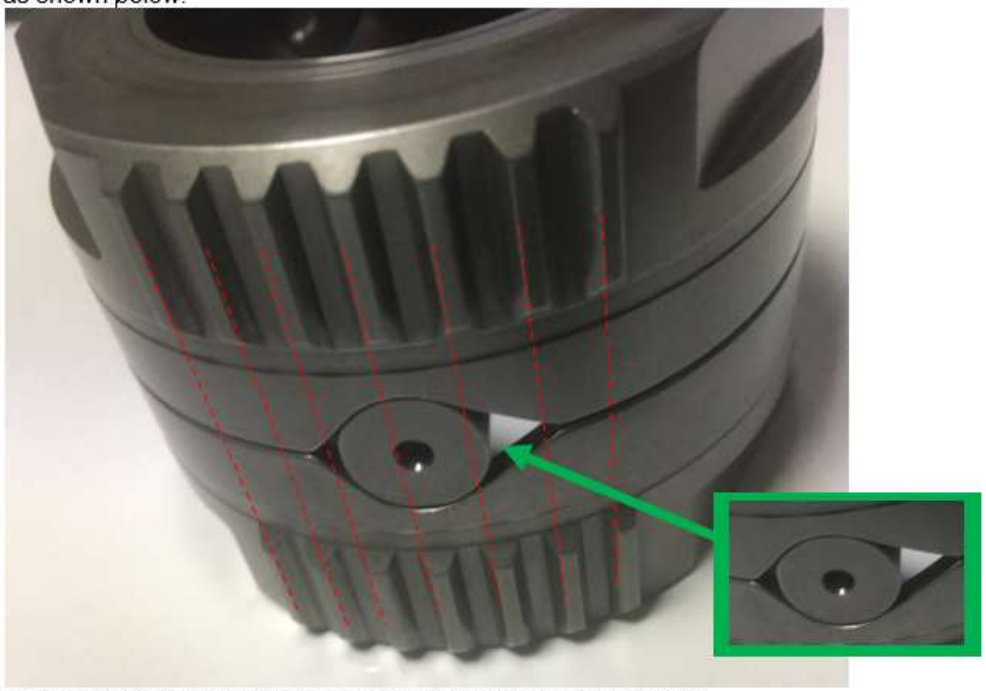
A simple check to ensure the differential hasn't got float is to unwind the adjuster screw so that all sprung preload is removed. The torque-to-turn can then be checked, it is recommended that the value is at least 10Nm. A zero value should not be run as this is indicates that the stack is not clamped. Running the differential in this manner will likely result in damage, in particular to the ramp surface where the spiders run.

It should also be noted that new differentials are built with new plates which will run in, resulting in a drop-off in BASE preload. Hewland build new diffs with a 30-40Nm BASE preload set, this will diminish during initial running and the BASE preload should be reset if the torque-to-turn value measured using the method detailed above is less that 5Nm

DIFFERENTIAL BUILD/SETUP GUIDELINES CONTINUED

Ramp Orientation (EGTA-213-7# side ring gears and GFTW-213-15 spider)

The EGTA-213-7# Side Ring Gears (also referred to as RAMPS) are supplied as a pair, one LH and one RH part. They have 3 segments of splines on the outside. These splines are timed to the ramp cut-outs of which there are 4 (to suit the 4 legs of the spider). Due to this, there are 4 positions that the ramps and spider can be fitted together. Only one of which is correct, as shown below: -



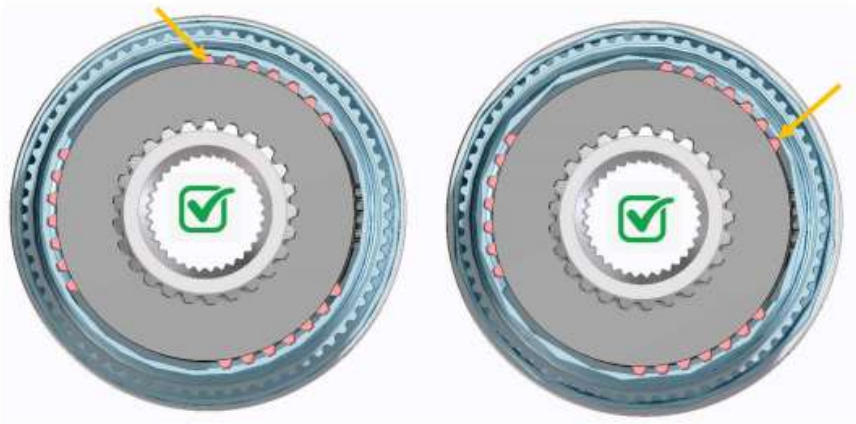
The correct position is to have the three segments of spline fully aligned.

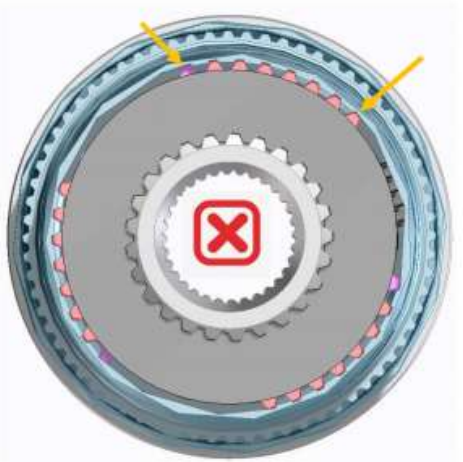
When the ramps are orientated in this way, the spider will sit correctly in them when installed into the diff case GFTW-213 as shown in the detail view above

Note that for 2022> the CFT gearbox will be fitted with the CFT-212 differential which utilises the CS-1824-# & CS-1825-# spider & ramp arrangement (in place of GFTW-212 Diff fitted with EGTA-213-7-# and GFTW-213-15 parts shown here). These have ramp angles integral to the spider trunions, however the differential guidelines detailed here remain applicable to both.

Spline Orientation into diff case

The diff case GFTW-213 has 3 segments of splines which drive the clutch plates and the side ring gears (ramps). When assembling the diff stack into the case, care must be taken to ensure the splines are all positioned (biased) to the same side. This is especially important for the two halves of the ramps. They should be fitted so that full engagement of splines is achieved and doesn't matter if the splines are offset to the left or right as long as all the components in the diff stack are installed the same:-





DIFFERENTIAL BUILD/SETUP GUIDELINES CONTINUED

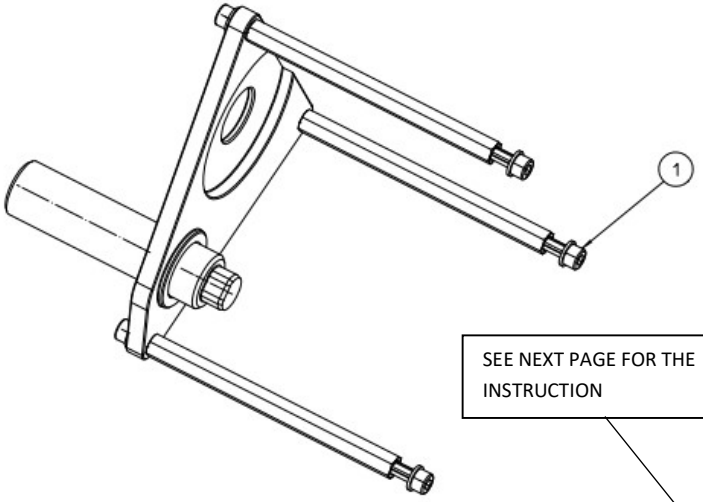
When the differential is assembled correctly, the last clutch plate will sit approx. 1-2mm below the end of the diff case and the last core plate should sit almost flush: -

One of the other three (incorrect) positions that the ramps and spider can be orientated will still allow them to assemble into the diff case: -

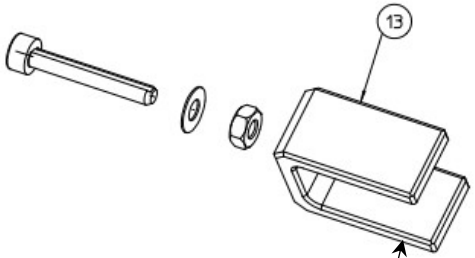
If the ramps are assembled in this orientation into the diff case, it is still possible to fit the subsequent diff plates, however the last clutch plate will not sit fully within the diff case, and the final core plate will be sitting above the top of the diff case:-

Even with the stack incorrectly built, it will still be possible to screw on the diff cap. It is therefore critical that the differential is not assembled if the plates are protruding in this way – if the top plates are sitting high, the stack must be removed, the ramp orientation checked and corrected before the differential cap is refitted and the base preload set.

GEARBOX TOOLING



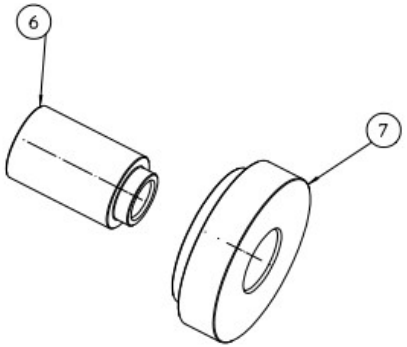
FORK SETTING FIXTURE



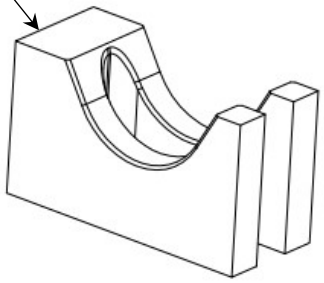
FORK PIN REMOVER TOOL

SEE NEXT PAGE FOR THE INSTRUCTION

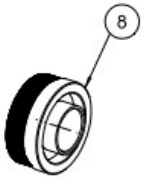
SEE THE PAGE 31 FOR THE INSTRUCTION



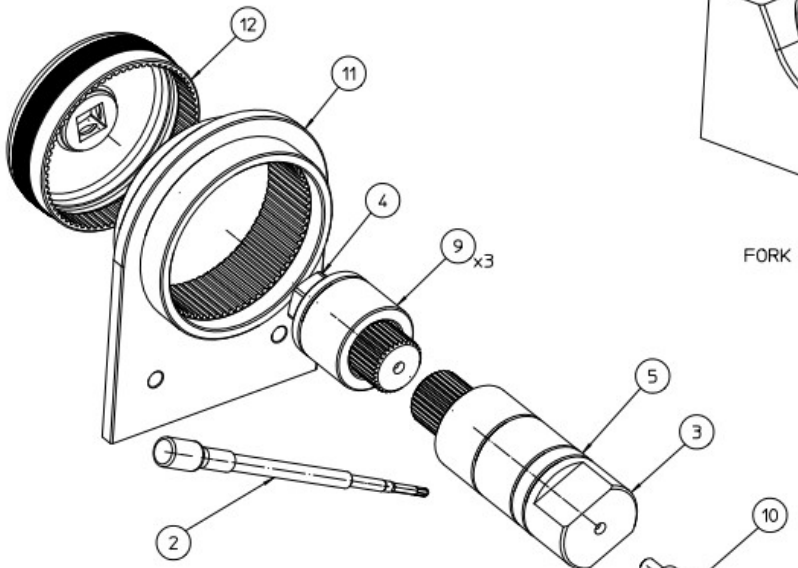
LIP SEAL PRESS TOOLS



FORK PIN ASSEMBLY TOOL



SLAVE CYLINDER TOOL

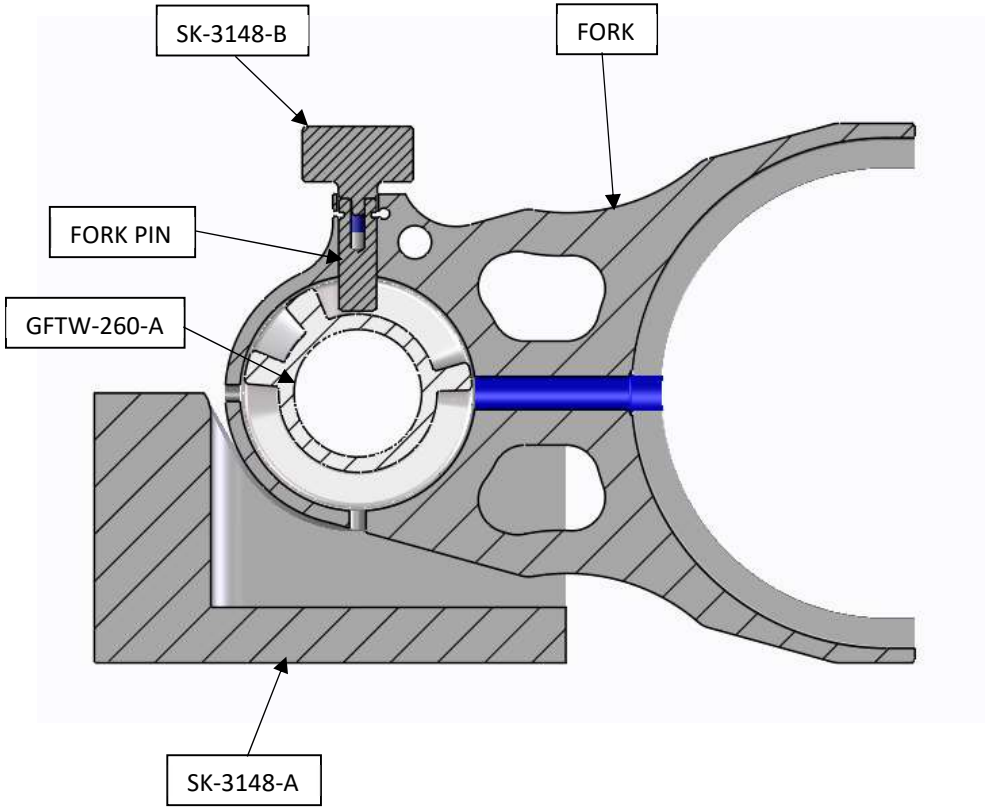


DIFF SETTING TOOLS

THIS PULLER CAN BE USED WITH HEWLAND PART AT-019 OR ANY OTHER SLIDE HAMMER.

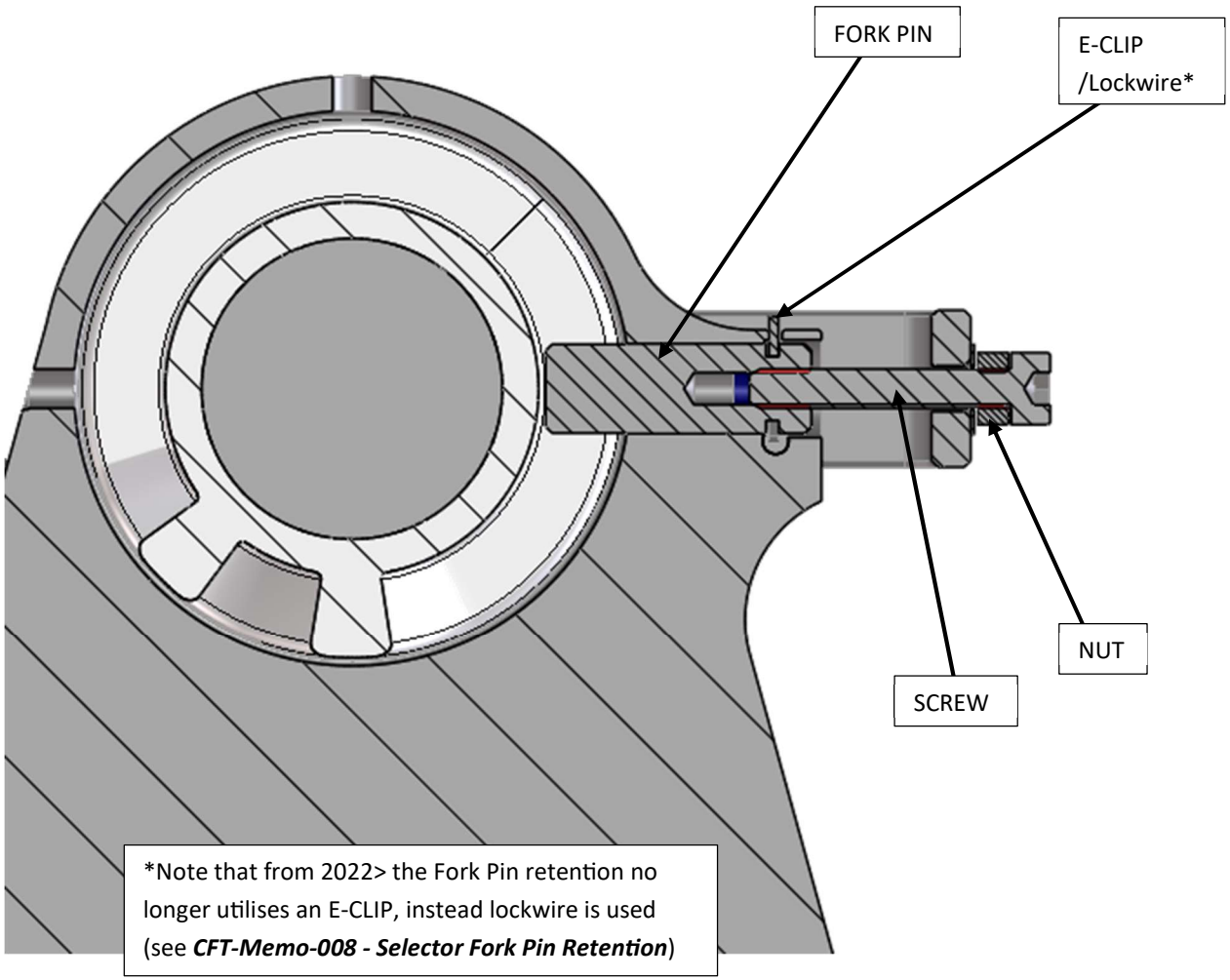
Bill of Material	CFT-TOOLING	
Position	Qty	PartNo	PartName
1	1	SK-3035	CFT FORK SETTING FIXTURE
2	1	SK-1623	DIFF ADJUSTMENT TOOL
3	1	SK-838-A	DIFF HOLDING POST
4	1	SK-838-C	DIFF PRELOAD TOOL
5	1	SK-2975-A	SPACER
6	1	SK-3036	LIP SEAL TOOL
7	1	SK-3038	LIP SEAL TOOL
8	1	SK-3139	SLAVE CYLINDER TOOL
9	3	SK-838-B	COLLAR (TPT DIFF PRELOAD TOOL)
10	1	AT-019-J	M10 FEMALE PULLER
11	1	SK-3049	CFT-DIFF SUPPORT
12	1	SK-3123	DIFF TIGHTENING TOOL
13	1	SK-3143	FORK PIN REMOVAL TOOL
14	1	SK-3148	SK-3148

FORK PIN ASSEMBLY TOOL



1) Slide the fork onto the correct position on the selector barrel.
2) Place the fork and barrel assembly onto SK-3148-A.
3) Locate the fork pin in the hole
4) Press the fork pin into position using SK-3148-B.

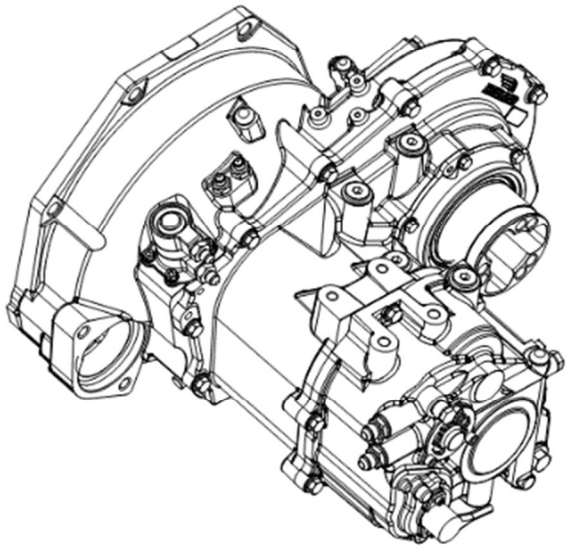
FORK PIN REMOVER TOOL INSTRUCTION

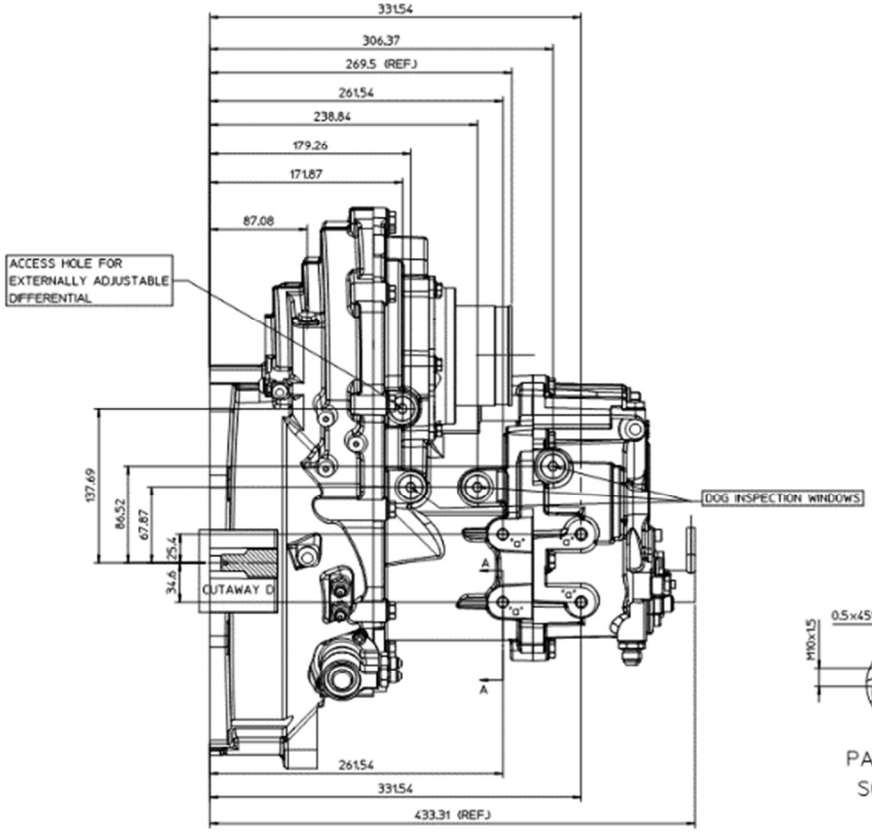


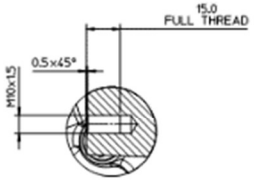
*Note that from 2022> the Fork Pin retention no longer utilises an E-CLIP, instead lockwire is used (see ***CFT-Memo-008 - Selector Fork Pin Retention***)

1) Remove the E-Clip or Lockwire *
2) Place the tooling SK-3143 in place and screw the screw into the fork pin
3) Unscrew the nut to get the fork pin out

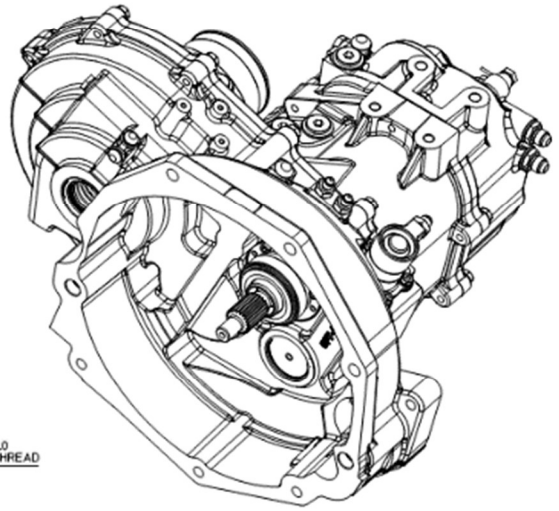
INSTALLATION DRAWING



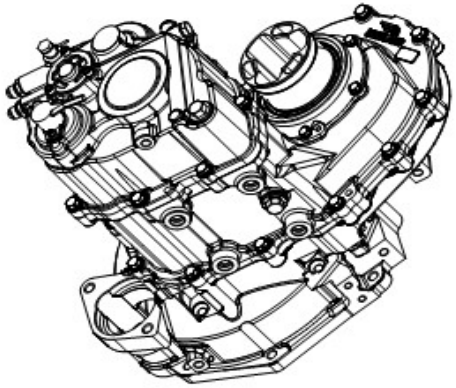


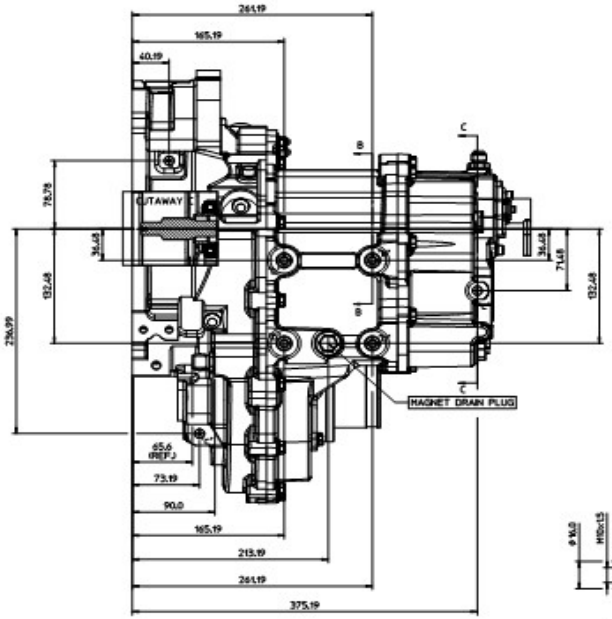


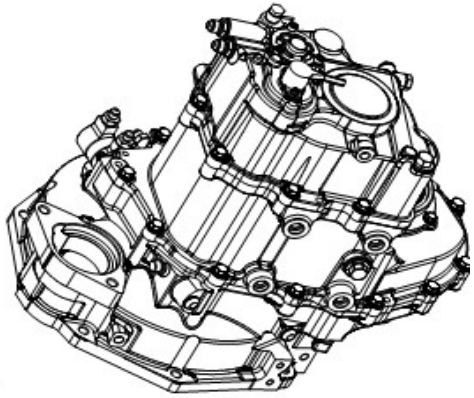
PARTIAL A-A
SCALE 1:1



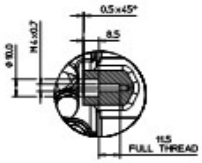
INSTALLATION DRAWING



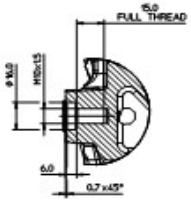




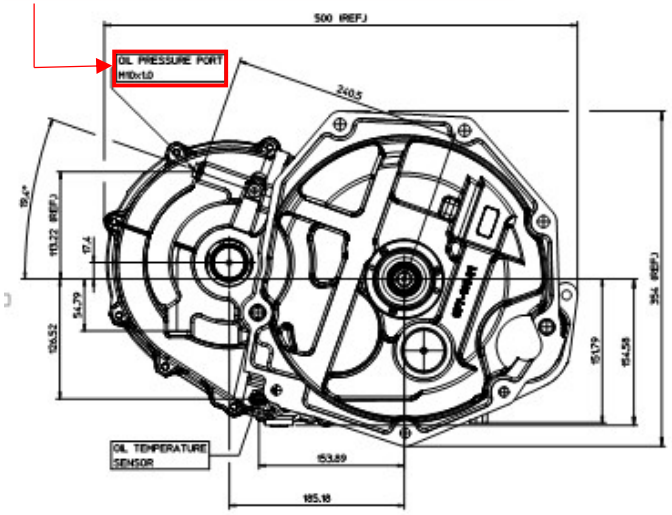
NOTE:- Hewland strongly recommend an oil pressure sensor is fitted and monitored at all times to ensure the pressurised oil system is functioning during running. Teams should make certain the gearbox is filled with the correct oil volume – running a low oil level could result in a lack of forced lubrication, this can be particularly detrimental to the life and performance of the differential and its component parts

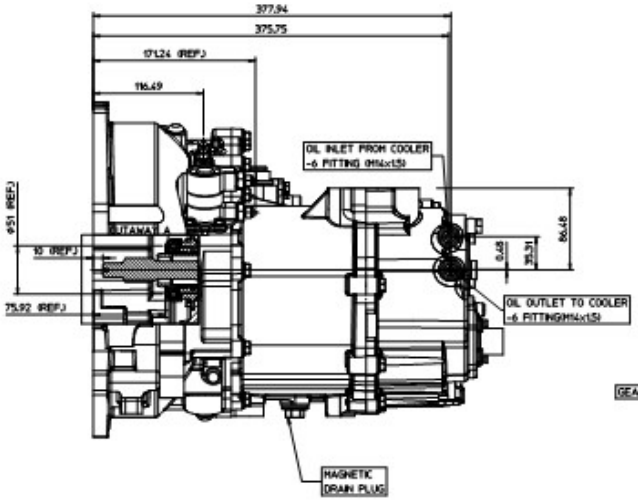


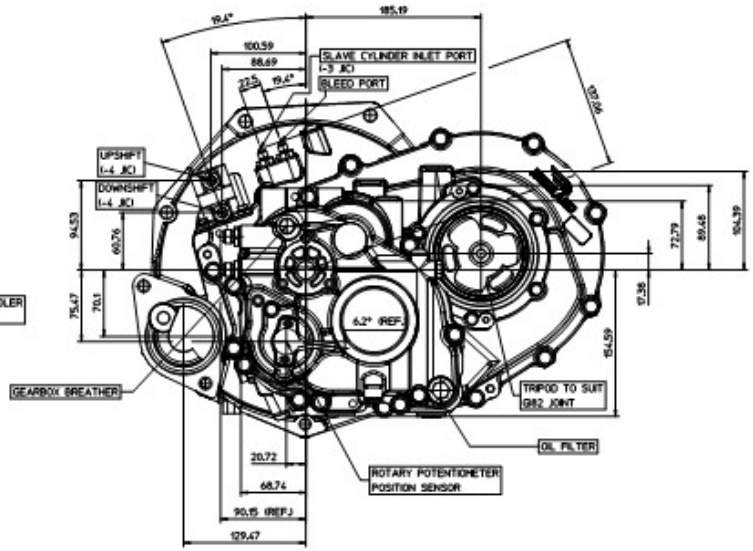
PARTIAL C-C



PARTIAL B-B

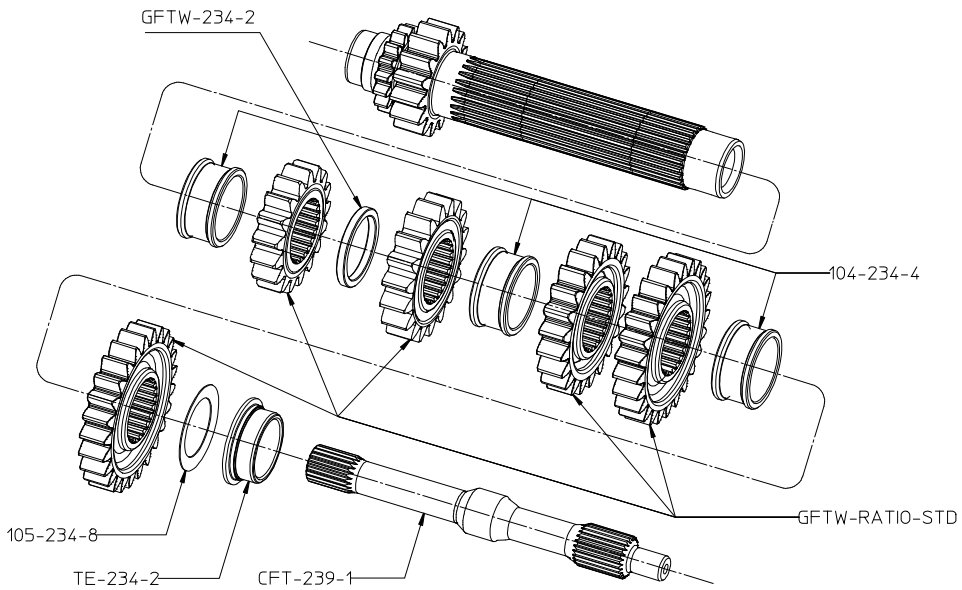






ALTERNATE (WIDE) GEAR ARRANGEMENT - LAYSHAFT

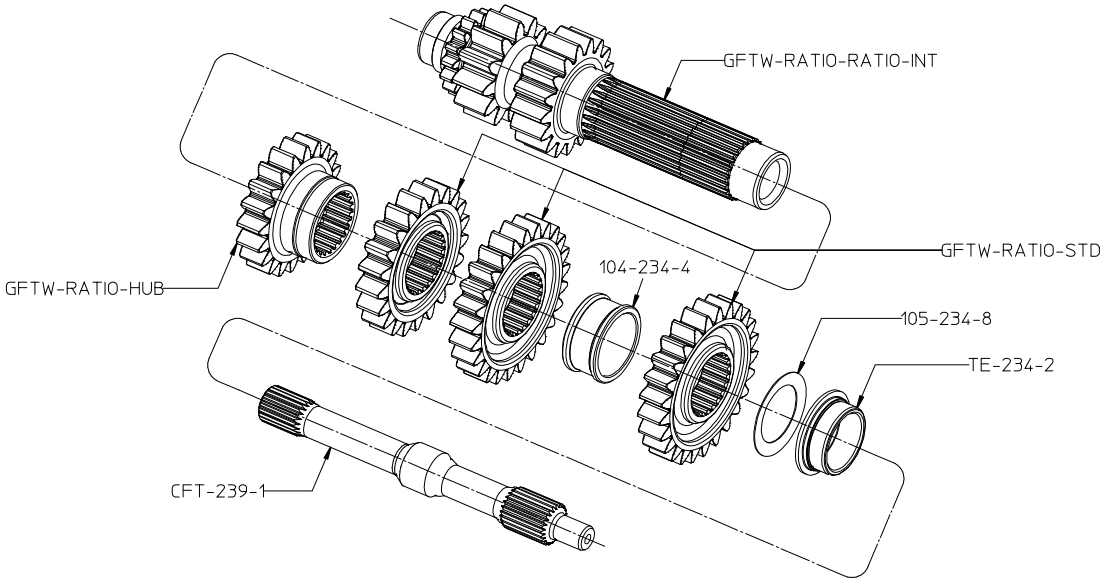
INTERGRAL 1ST LAYSHAFT



Arrangement uses the same 1st Gear Integral Layshaft as standard (already wide type), but with 2nd – 6th gear positions also wide (GFTW)

INTERGRAL 1ST/2ND LAYSHAFT

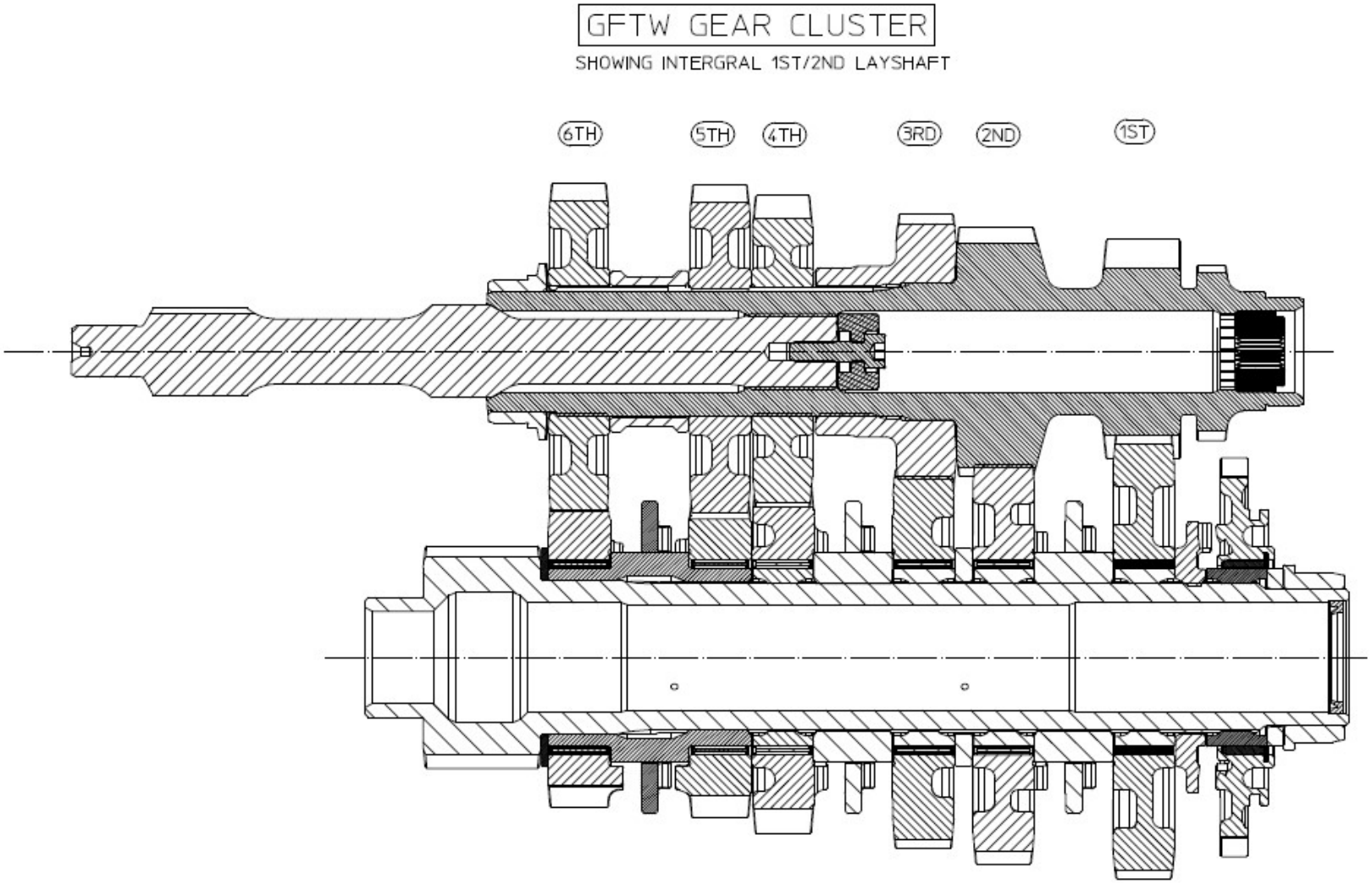
THIS LAYHAFT ARRANGEMENT IS SHOWN IN THE SECITON BELOW



Arrangement uses an integral 1st / 2nd Gear Layshaft (wide type), along with a wide hubbed 3rd gear.
4th – 6th gear positions are also wide (GFTW)

Equivalent ratio set (as per CFT-200-003 build ratios but WIDE)			
Gear Ratios	1st	12/28	GFTW-12:28-17:30-STD
	2nd	17/30	
	3rd	20/28	GFTW-20:28-HUB
	4th	21/24	GFTW-21:24-STD
	5th	25/24	GFTW-25:24-STD
	6th	30/25	GFTW-30:25-STD

ALTERNATE (WIDE) GEAR ARRANGEMENT - CLUSTER



DIFFERENTIAL REMOVAL

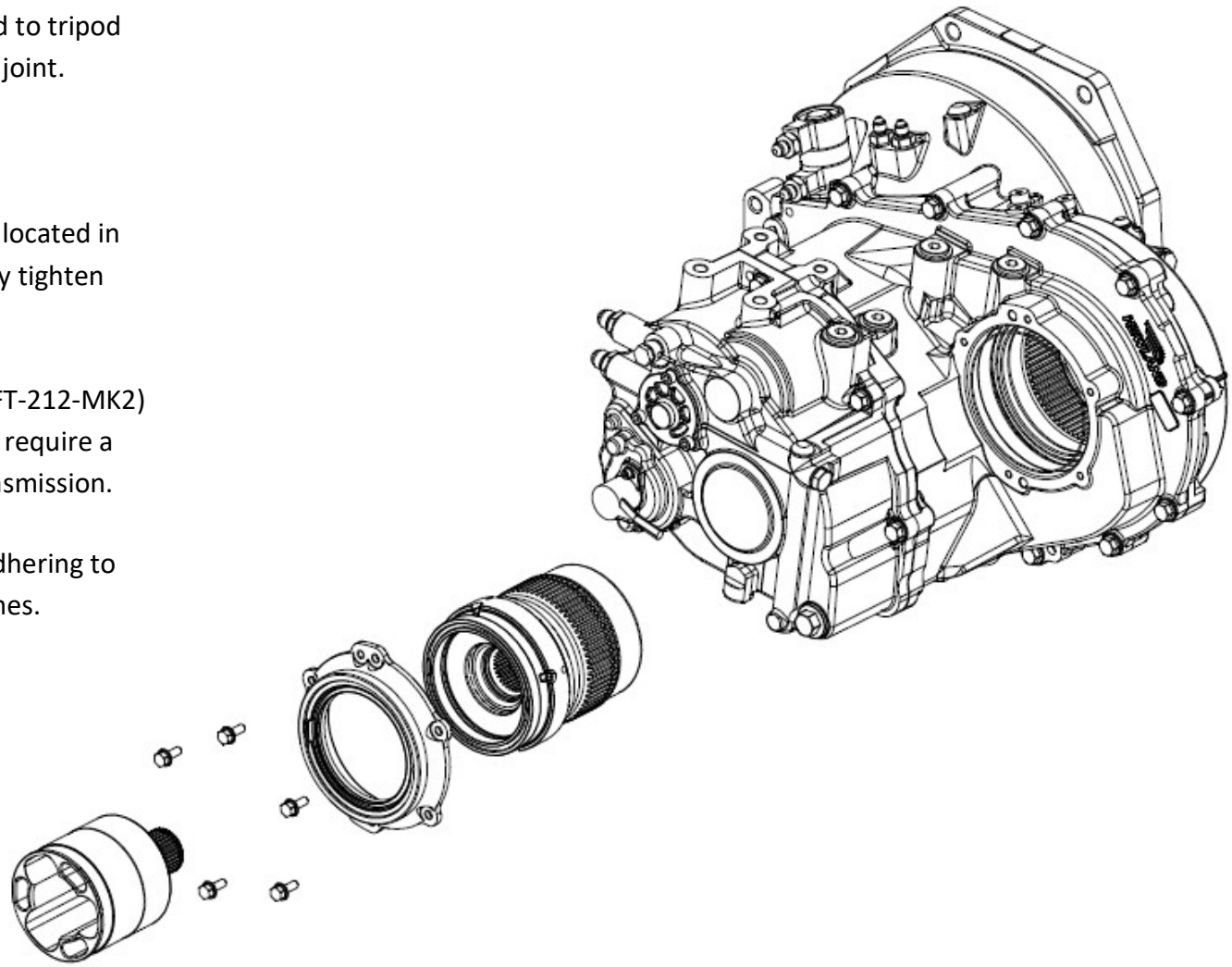
1) Remove Tripod (CFT-218/CFT-218-S/CFT-218-MK3), using slide hammer. This can be attached to tripod via the M10 thread at the bottom of the joint.

2) Remove 6x bolts (SCR-423)

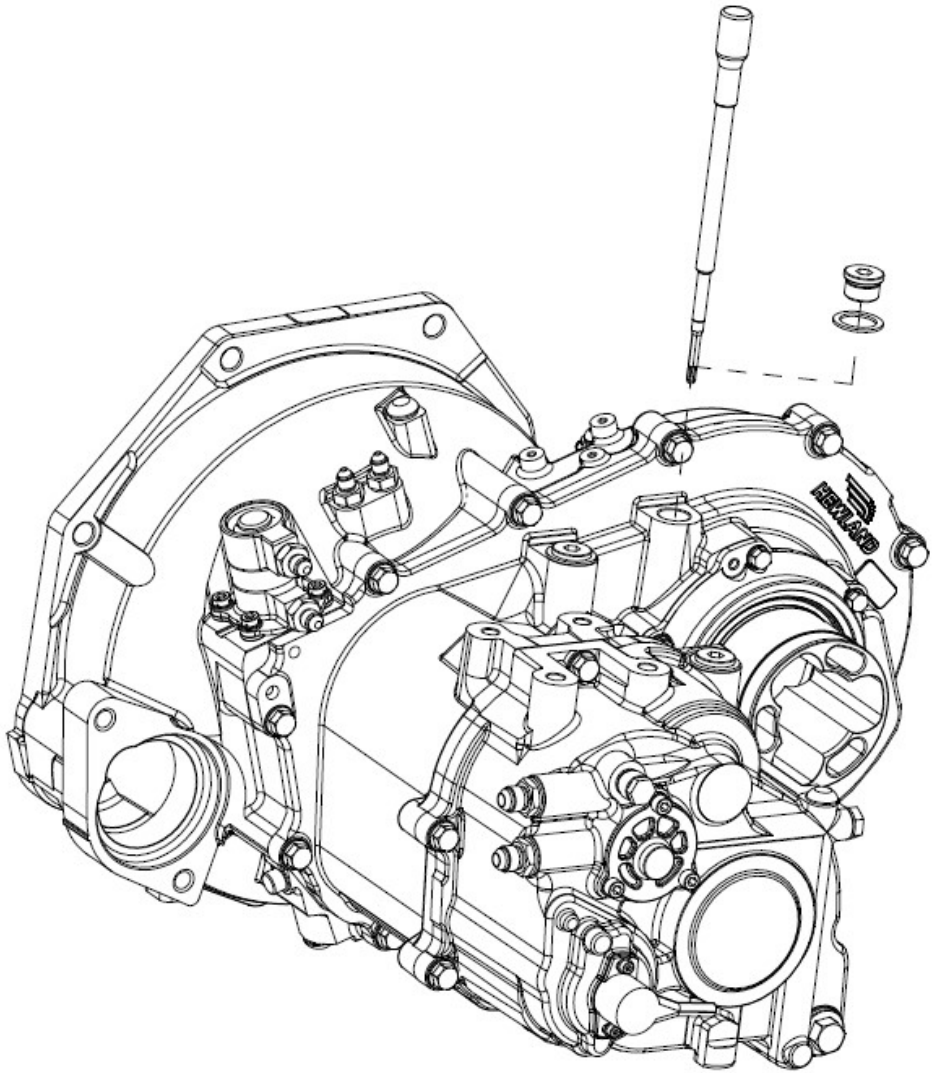
3) Screw 2 x M5 bots in to jacking off holes located in seal housing (GFTW-208). Simultaneously tighten screws to evenly remove seal housing.

4) Slide differential (GFTW-212/CFT-212/CFT-212-MK2) out of final drive (GFTW-221), this might require a light tap from the engine side of the transmission.

5) Replace components in reverse order, adhering to the specification chart provided at all times.



PRE-LOAD ADJUSTMENT



1) Remove Plug and Washer (PLU-137 & HP-M-9042).

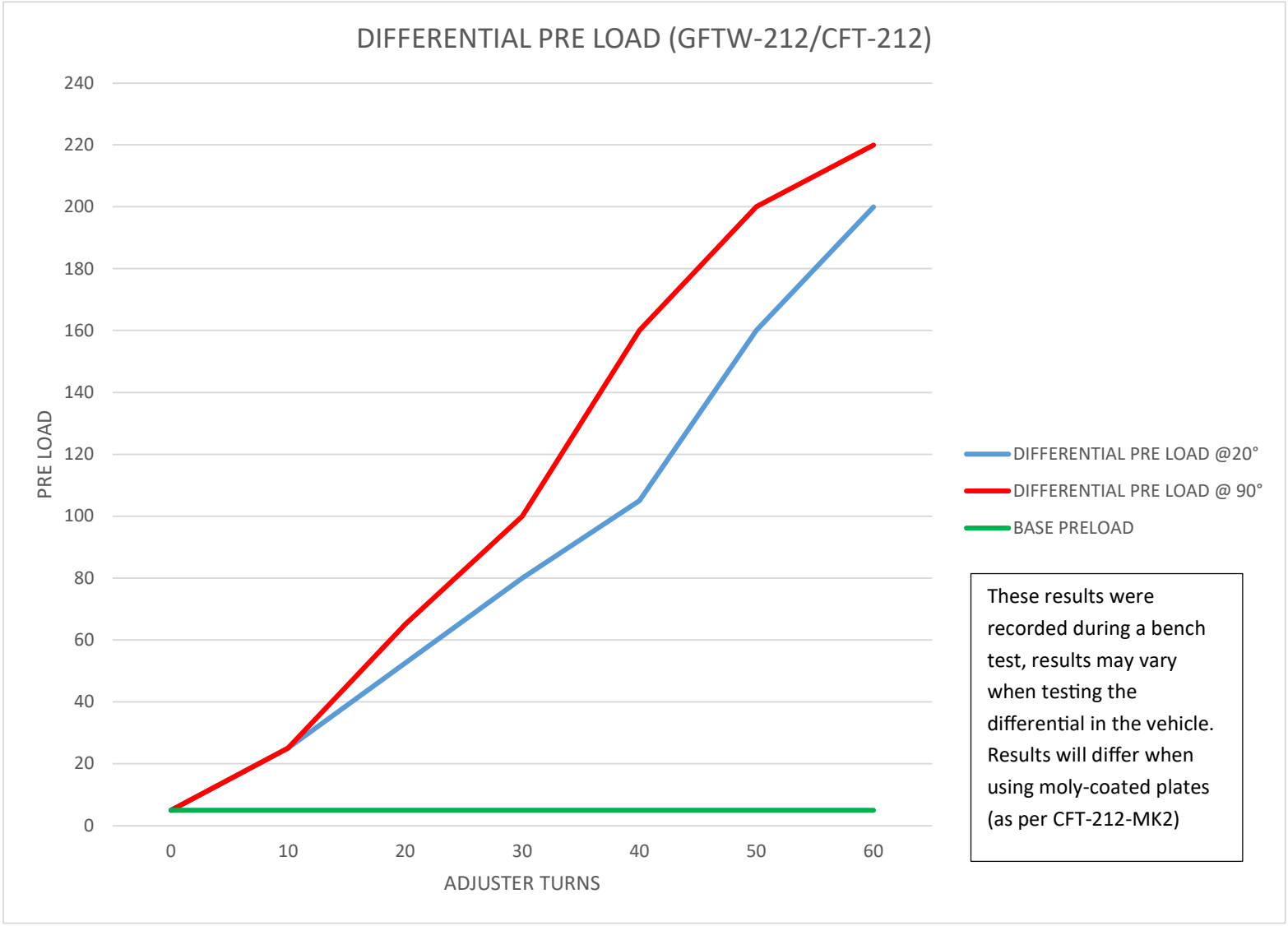
2) Turn output joints, until preload adjuster on differential lines up with the access port in the casing.

3) Insert differential adjuster tool SK-1623, until it locates into the differential and adjust until the desired preload is achieved (Rotate adjuster **Anti-clockwise** to increase preload).

4) If the differential is being set from factory the table on the following page can be used as a guide to speed up initial setup.

5) Replace Plug and Washer (PLU-137 & HP-M-9042), when refitting adhere to the specification chart provided

PRE-LOAD ADJUSTMENT



These results were recorded during a bench test, results may vary when testing the differential in the vehicle. Results will differ when using moly-coated plates (as per CFT-212-MK2)

1) When adjusting differential start by winding adjuster clockwise until a hard stop is reached.

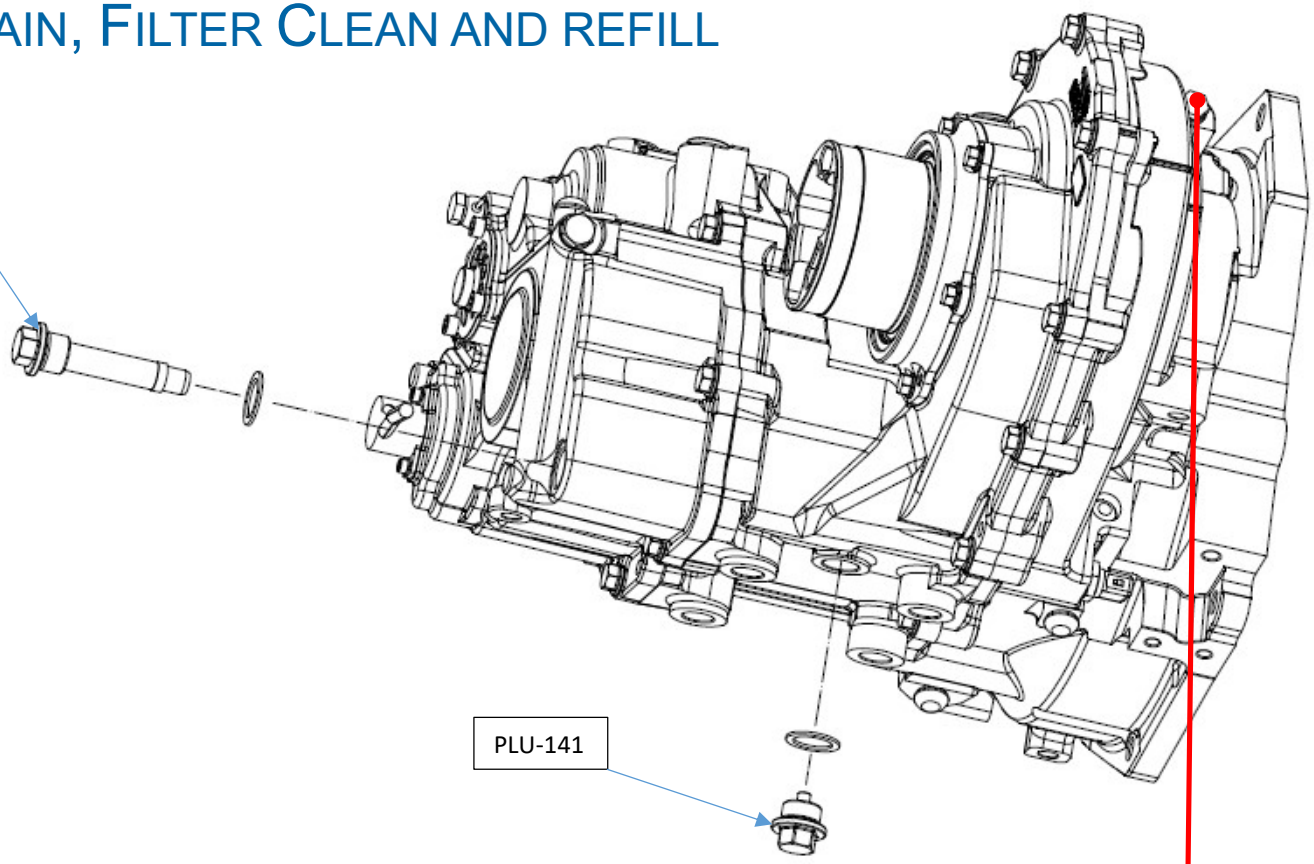
2) Then wind the adjuster anti clockwise until the adjust contacts the preload spring. (approximately 60 turns).

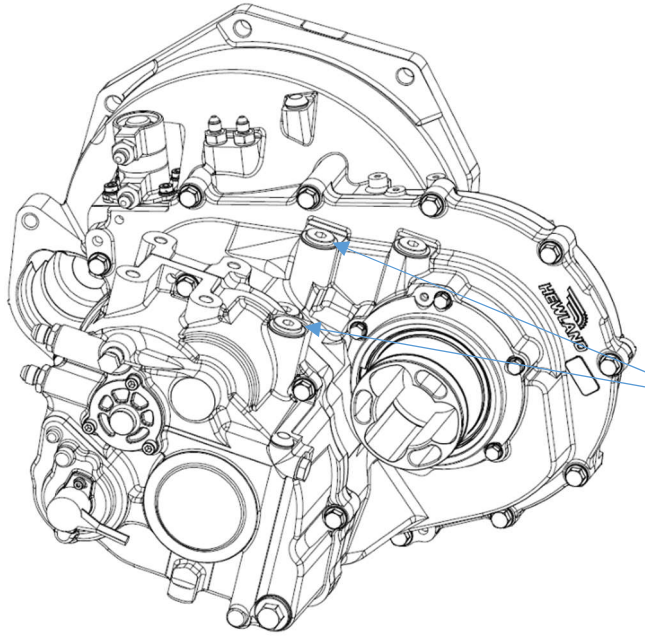
3) Do not over tighten adjuster this may result in damaging threaded components.

OIL DRAIN, FILTER CLEAN AND REFILL

1) To drain oil, remove drain plug (PLU-141). Clean debris off magnet before refitting. When refitting adhere to the specification chart provided

2) When oil is drained, Remove filter (TE-266) ensure filter is thoroughly cleaned before refitting. When refitting adhere to the specification chart provided.

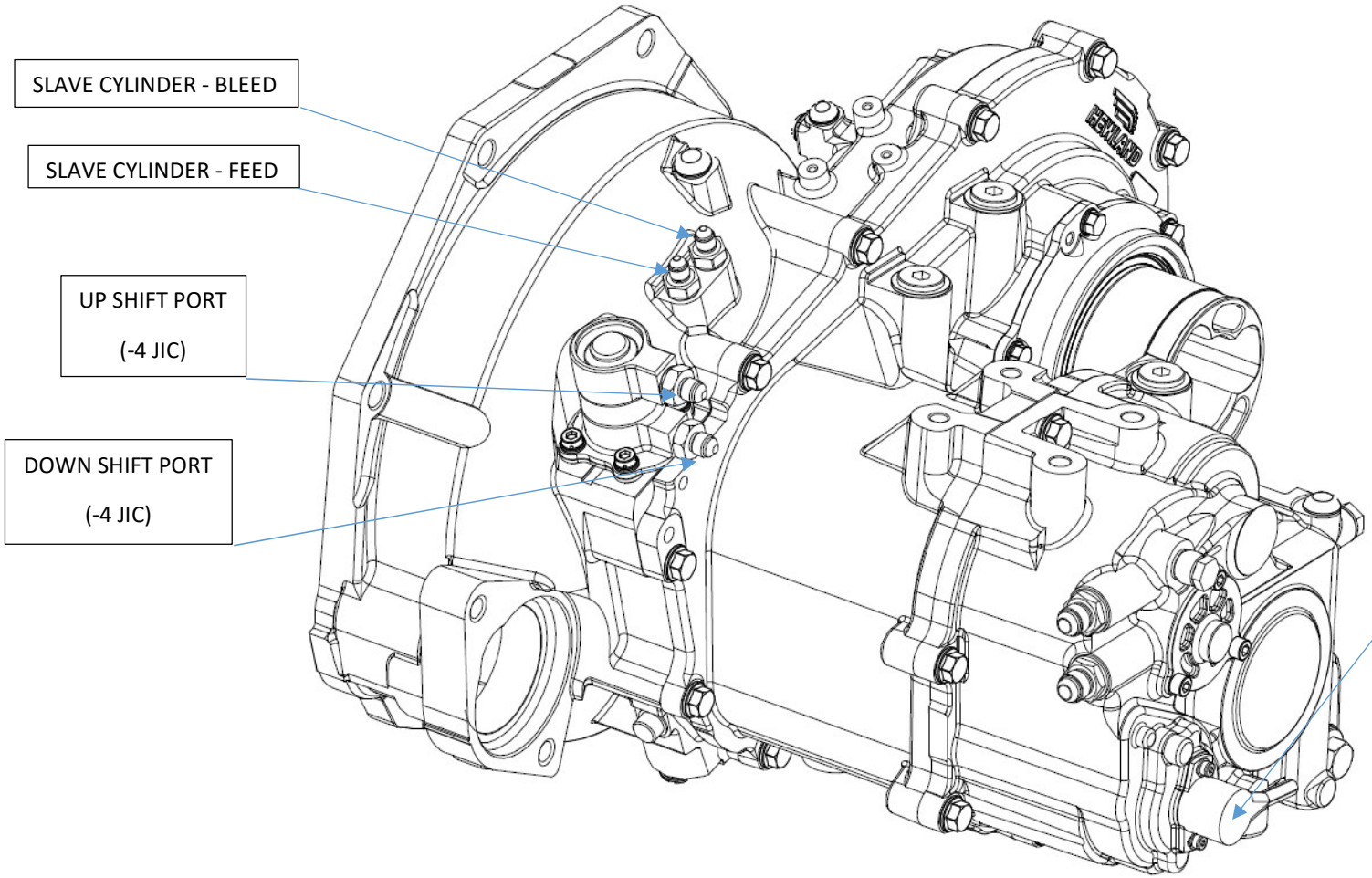




3) Oil can be refilled through either of the indicated PLU- 137's. When refitting adhere to the specification chart provided.

NOTE:- Hewland strongly recommend an oil pressure sensor is fitted here (M10X1.0 port) and monitored at all times to ensure the pressurised oil system is functioning during running. Teams should make certain the gearbox is filled with the correct oil volume **(see page 4)** – running a low oil level could result in a lack of forced lubrication, this can be particularly detrimental to the life and performance of the differential and its component parts

GEAR POTENTIOMETER, ACTUATOR AND SLAVE CYLINDER



ELC-030 – W Connection Table	
Pin	**Connection**
Pin 1	Not connected
Pin 2	Gear Position
Pin 3	+5v
Pin 4	Not connected
Pin 5	ANA Ground

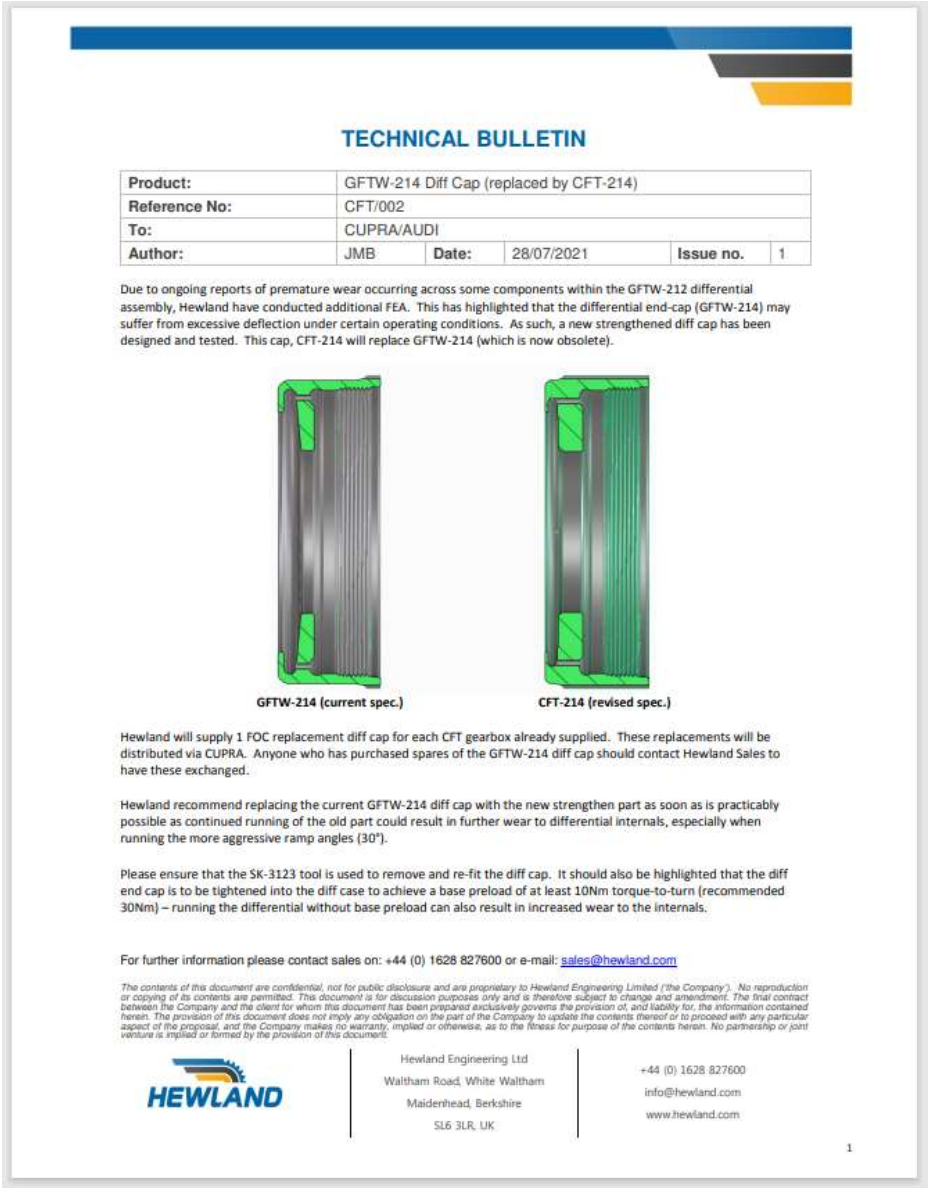
When setting semi auto system refer to the below table for gear position voltages.

Estimated Potentiometer values	
Gear	**V+**
R	0.53
N	1.10
1	1.65
2	2.22
3	2.78
4	3.35
5	3.91
6	4.47

TECHNICAL BULLETINS & MEMOS

Note

CFT/001 bulletin references a change made during prototype testing of the CFT gearbox and its contents is not therefore applicable to this manual



TECHNICAL BULLETIN

Product:	GFTW-214 Diff Cap (replaced by CFT-214)				
Reference No:	CFT/002				
To:	CUPRA/AUDI				
Author:	JMB	**Date:**	28/07/2021	**Issue no.**	1

Due to ongoing reports of premature wear occurring across some components within the GFTW-212 differential assembly, Hewland have conducted additional FEA. This has highlighted that the differential end-cap (GFTW-214) may suffer from excessive deflection under certain operating conditions. As such, a new strengthened diff cap has been designed and tested. This cap, CFT-214 will replace GFTW-214 (which is now obsolete).

GFTW-214 (current spec.) CFT-214 (revised spec.)

Hewland will supply 1 FOC replacement diff cap for each CFT gearbox already supplied. These replacements will be distributed via CUPRA. Anyone who has purchased spares of the GFTW-214 diff cap should contact Hewland Sales to have these exchanged.

Hewland recommend replacing the current GFTW-214 diff cap with the new strengthen part as soon as is practicably possible as continued running of the old part could result in further wear to differential internals, especially when running the more aggressive ramp angles (30°).

Please ensure that the SK-3123 tool is used to remove and re-fit the diff cap. It should also be highlighted that the diff end cap is to be tightened into the diff case to achieve a base preload of at least 10Nm torque-to-turn (recommended 30Nm) – running the differential without base preload can also result in increased wear to the internals.

For further information please contact sales on: +44 (0) 1628 827600 or e-mail: sales@hewland.com

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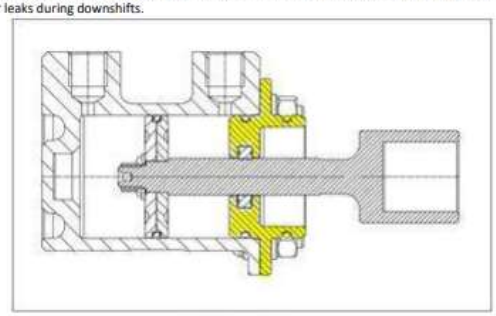
1

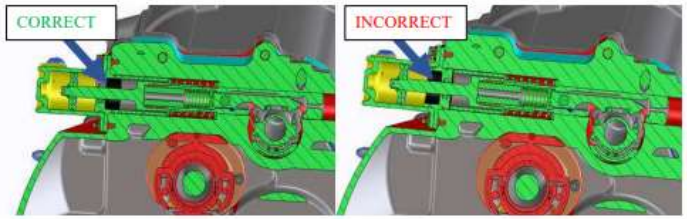
TECHNICAL BULLETIN

Product:	PNU-136 shift actuator assembly				
Reference No:	CFT/003				
To:	CUPRA/AUDI				
Author:	JMB	**Date:**	01/09/2022	**Issue no.**	1

It has been observed that it is possible to fit the actuator end cap (PNU-136-B) in the incorrect orientation. If the unit is assembled with the cap in the wrong way, the selector rack will sit out of position by approx. 1mm. This will result in incorrect shift stoke and can cause shifting issues. In addition, the seal on the actuator rod will be out of position and this could result in air leaks during downshifts.



Please ensure that the cap is fitted in the correct orientation, as shown above



HEWLAND

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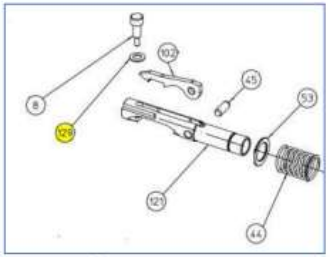
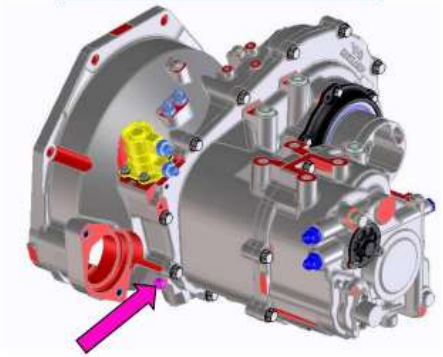
info@hewland.com
www.hewland.com

TECHNICAL BULLETIN

Product:	Selector Rack Anti-rotation pin & washer				
Reference No:	CFT/004				
To:	CUPRA/AUDI				
Author:	JMB	**Date:**	01/09/2022	**Issue no.**	1

It should be noted that the washer (WSH-028) which sits under SCR-349 anti-rotation pin must be fitted. If this washer is omitted, the anti-rotation pin could cause the rack to stick. It should also be noted that using an incorrect specification washer could also have this effect. A washer no less than 1mm must be fitted (Hewland recommend only the correct WSH-028 is used)





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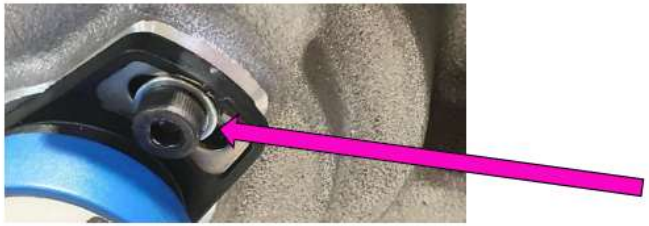
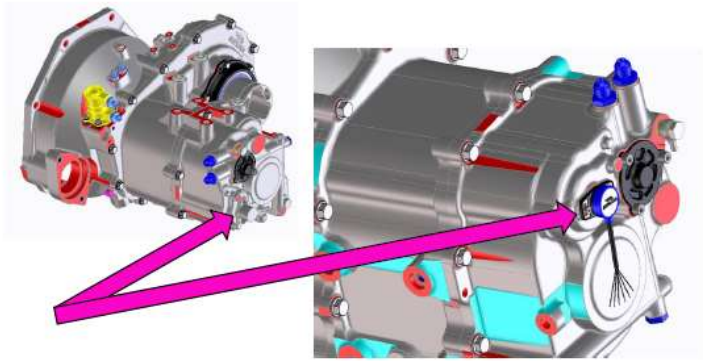
TECHNICAL BULLETIN

Product:	Gear Pot washers				
Reference No:	CFT/005				
To:	All				
Author:	LVM	**Date:**	24/11/2022	**Issue no.**	1

To avoid damage the GEAR POT, when the ELC-091-# is used:
washers 240-040 **should NOT** be installed.
Washers should be used with ELC-029/030/038





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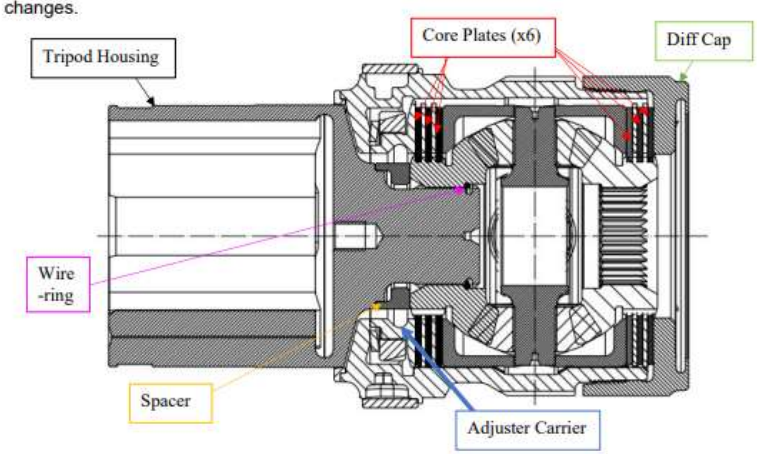
TECHNICAL MEMO

Product:	CFT-212-MK2 Diff – upgrading from CFT-212				
Reference No:	CFT-Memo-015				
To:	CUPRA				
Author:	JMB	**Date:**	09/05/2024	**Issue no.**	2

The CFT-212-MK2 differential has 2 main differences from its predecessor CFT-212.

- Upgraded Tripod Housing
- Introduction of Molybdenum core plates

It is possible to upgrade an existing CFT-212 differential to include both or either of these changes.



CFT-212-MK2 Differential

Upgrading the tripod housing

The upgraded tripod housing part number is CFT-218-MK3 and this replaces CFT-218-S. To upgrade, the spacer SK-2075-A needs to be replaced with CFT-213-9.
It is recommended that the wire-ring which retains the tripod housing into the differential is also replaced – part number CIR-052 (specification of this part has not changed)

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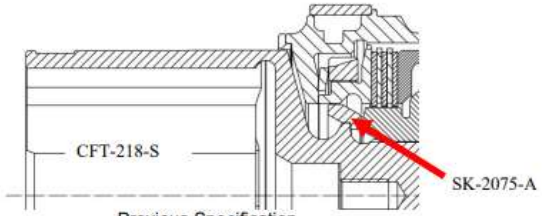
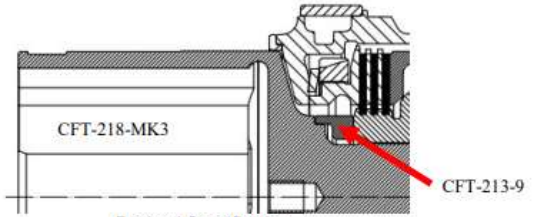


Previous Specification



Revised Specification

Switching core plates from PARCO to Molybdenum coated

Due to the additional thickness of the Molybdenum coating (across the 6 core plates), the overall differential internal cluster would increase in length if only the plates were changed. This would result in an issue with installation into the CFT gearbox, due to the additional length (as it would clash with the maincase oilway). To overcome this issue, when fitting the Moly plates, it is necessary to modify both the adjuster carrier and the diff end cap.

Previous specification (PARCO)
Part No. ***TPT-213-8***
Thickness = 1.6-1.7mm

Revised Specification (MOLY)
Part No. ***TPT-213-8B***
Thickness = 1.95-2.0mm

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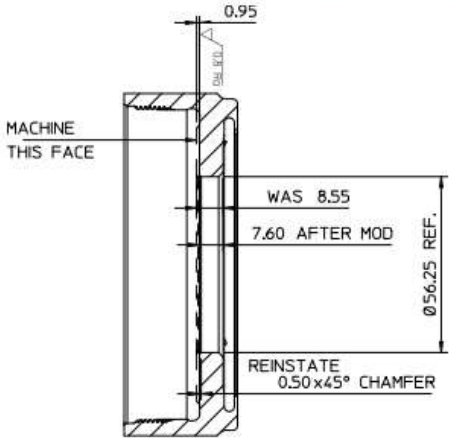
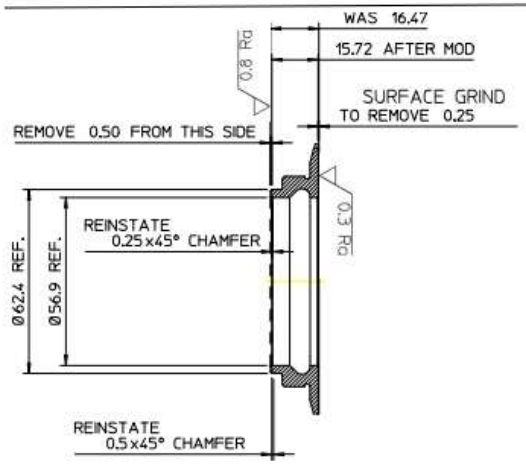
The following images outline how to modify the existing parts (all dimensions in mm):-



CFT-214 DIFF CAP → becomes CFT-214-A after modification



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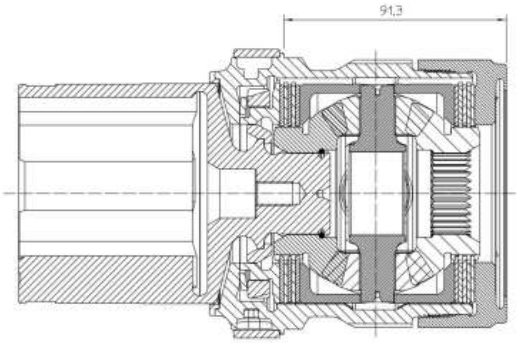
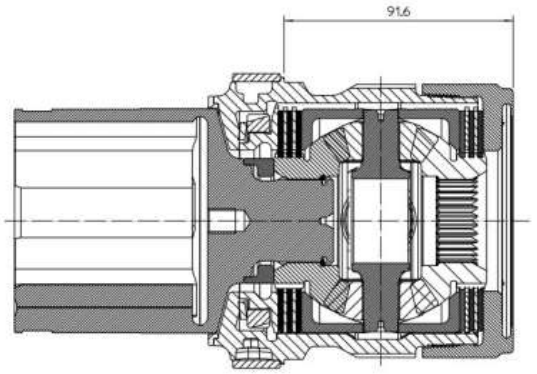
Hewland have given these modified parts a new designation (-A suffix). Customers wishing to upgrade any existing CFT-212 units to run with the Moly plates (part number TPT-213-8B) will need to undertake the modifications shown, or alternatively they can order the revised parts CFT-214-A and EGTA-213-5A from Hewland.



Previous Specification (CFT-212)



Latest specification (CFT-212-MK2)

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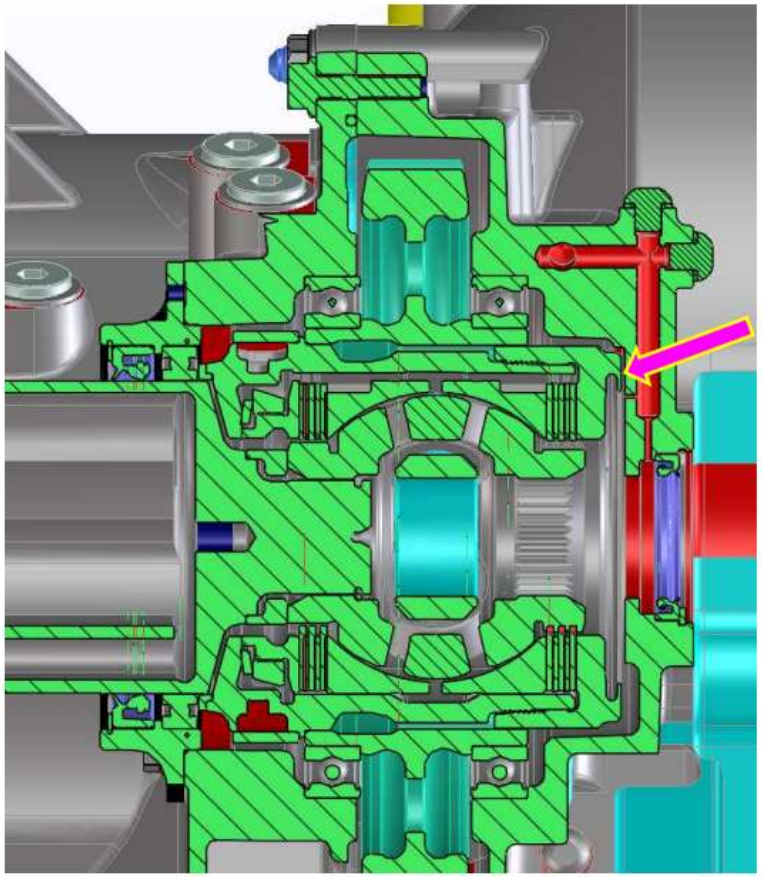
It should be noted that even with the modifications to the carrier & diff cap, the overall length of the CFT-212-MK2 differential assembly is approx. 0.3mm longer than the previous unit. Due to this, when fitting the MK2 differential, it is important that customers check the clearance in the area shown below:-



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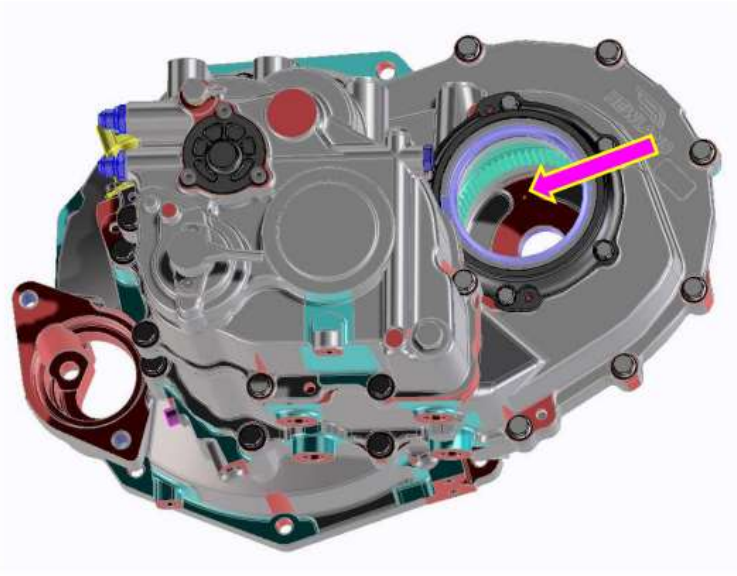

If the diff cap contacts the casing in this area, it may be necessary to dress a clearance into the maincase (by using a Dremel or similar tool). No more than 0.75mm should be removed due to the proximity of the oil drilling in the casing

Note:-
Gearboxes built by Hewland to CFT-200-004 *"2024 CUPRA specification"* will be installed with latest CFT-212-MK2 differentials and will already have the revised adjuster carrier and end caps fitted. The clearance between the differential and maincase will have been checked.

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REVISION HISTORY

ISSUE	MODIFICATION	PAGE	DATE	INITIALS
1	First Issue	n/a		LM
2	Change from DTT gears to GFTW gears		06/09/2019	PH
3	Updated the gearbox tooling and added peening instruction and change of Loctite for SCR-434	26/27	28/10/2019	ATLL
4	Added instruction for the fork pin remover tool	29	31/10/2019	ATLL
5	Addition of tooling for assembling the fork. Update of BOM table and assembly views. Change from GFTW to CFT gear set for weight saving. Addition of a page showing the GFTW gear cluster as an alternate option. Update to GFTW Diff	28	19/11/2019	PH
6	Screw notes updated for appropriate Loctite and lockwire. Gear Pot. Part number corrected (was ELC-029 in error)	18,21,22,23, 28	19/03/2020	PH
7	Quick reference pages added	37-41	03/06/2020	AH
8	Item 12 (Spider) was EGTA-213-15 Installation views updated (bosses are shorten by 2mm)	29, 34	14/10/2020	LM
9	Alternative spacer GFTW-221-2A added	9	03/02/2021	LM
10	Mainshaft height setting added	9		
	Differential BOM table updated (latest spider) and ramp option angles added	30		
	Differential Build/Setup Guideline (as per CFT-Memo-006) added	31-33	14/06/2021	JMB
11	Differential BOM table updated, showing CFT-214 strengthened diff cap CFT-212-001 Differential Specification added Gearbox Standard Build specifications added Slave cylinder kit number added Service kit part references added Clarification on E-Clip fork pin retention change (now lock-wire) Oil pressure Sensor fitment notes added Technical Bulletin page added	30-31 5 29 20 Various 39 & 45 47	31/08/2021	RCME
12	GFTW-234-2 spacer part number added and wide ratio set table added 2022 Clutchshaft added – CFT-239-3	40 16	08/11/2021	AZT
13	Part Numbers for button head screws correct. Was SCR-080, SCR-455 & SCR-456. Now all have “-SS” added to them. Cupra & Audi build variants clarified (Tripod Hsg & circlip added to 003A spec.) Page 11 (layshaft preload added). Gear Position Sensor blade orientation care point image added	5, 11, 18, 20,21, 23 & 24	29/06/2022	ADD/JMB
14	Mainshaft setting height check value revised to avoid unnecessary grinding of spacer Actuator cap orientation note added. Bulletin 003 & 004 added	9, 26 49 added	01/09/2022	JMB
15	Snap-ring note added	23	19/10/2022	JMB
16	Bulletin No-5 added	50	25/11/2022	LVM
17	Rev. Idler Spigot updated	17	28/04/2023	JMB
18	Added CFT-200-004(2024) spec, CFT-212-MK2 and swapped GFTW-231/231-1 for LGT-231/231-1 for 2024 spec	5,19,20,28,33	24/01/2024	OJE
19	CFT-212-MK2 Diff BOM updated & Memo #015 added for reference	33 & 52-54 added	09/05/2024	JMB

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