

MANUAL TRANSMISSION / TRANSAXLE

030RF-01

SERVICE DATA

MANUAL TRANSAXLE ASSY (C59)			
5th gear thrust clearance	STD:	0.10 – 0.57 mm (0.0039 – 0.0224 in.)	
	MAX:	0.57 mm (0.0224 in.)	
5th gear radial clearance	KOYO made	STD:	0.015 – 0.058 mm (0.0006 – 0.0023 in.)
		MAX:	0.058 mm (0.0023 in.)
	NSK made	STD:	0.015 – 0.056 mm (0.0006 – 0.0022 in.)
		MAX:	0.056 mm (0.0022 in.)
Synchronizer ring No.3 back and 5th gear spline end clearance	Min:	0.75 mm (0.0295 in.)	
Transmission hub sleeve No.3 and gear shift fork No.3 clearance	STD:	0.3 – 0.5 mm (0.012 – 0.0197 in.)	
5th gear inner diameter	STD:	29.915 – 29.931 mm (1.1778 – 1.1784 in.)	
	MAX:	29.931 mm (1.1784 in.)	
Reverse idler gear sub-assy inner diameter	STD:	18.040 – 18.058 mm (0.7102 – 0.7109 in.)	
	MAX:	18.058 mm (0.7109 in.)	
Reverse idler gear shaft outer diameter	STD:	17.966 – 17.984 mm (0.7073 – 0.7080 in.)	
	Min:	17.966 mm (0.7073 in.)	
Front transaxle case oil seal drive in depth		15.6 – 16.0 mm (0.6142 – 0.6299 in.)	
Input shaft front bearing drive in depth		0 – 0.3 mm (0 – 0.012 in.)	
Front differential case tapered roller bearing preload	New bearing	0.78 – 1.57 N·m (8 – 16 kgf·cm, 6.9 – 13.9 in.·lbf)	
Front differential case shim thickness	AA:	2.10 mm (0.0827 in.)	
	BB:	2.15 mm (0.0846 in.)	
	CC:	2.20 mm (0.0866 in.)	
	DD:	2.25 mm (0.0886 in.)	
	EE:	2.30 mm (0.0906 in.)	
	FF:	2.35 mm (0.0925 in.)	
	GG:	2.40 mm (0.0945 in.)	
	HH:	2.45 mm (0.0965 in.)	
	JJ:	2.50 mm (0.0984 in.)	
	KK:	2.55 mm (0.1004 in.)	
	LL:	2.60 mm (0.1024 in.)	
	MM:	2.65 mm (0.1043 in.)	
	NN:	2.70 mm (0.1063 in.)	
	PP:	2.75 mm (0.1083 in.)	
	QQ:	2.80 mm (0.1102 in.)	
	RR:	2.85 mm (0.1122 in.)	
SS:	2.90 mm (0.1142 in.)		
TT:	2.95 mm (0.1161 in.)		
UU:	3.00 mm (0.1181 in.)		
Transmission case oil seal drive in depth		9.9 ± 0.3 mm (0.390 ± 0.012 in.)	
Transaxle case oil seal drive in depth		1.9 ± 0.3 mm (0.075 ± 0.012 in.)	
Reverse restrict pin slotted pin drive in depth		15.5 ± 16.5 mm (0.6102 ± 0.6496 in.)	
Transmission clutch hub No.3 snap ring thickness	A:	2.25 mm (0.0886 in.)	
	B:	2.31 mm (0.0909 in.)	
	C:	2.37 mm (0.0933 in.)	
	D:	2.43 mm (0.0957 in.)	
	E:	2.49 mm (0.0980 in.)	
	F:	2.55 mm (0.1004 in.)	
	G:	2.61 mm (0.1028 in.)	
MANUAL TRANSAXLE ASSY (C60)			
6th gear thrust clearance	STD:	0.10 – 0.60 mm (0.0039 – 0.0236 in.)	
	MAX:	0.60 mm (0.0236 in.)	
5th gear thrust clearance	STD:	0.10 – 0.62 mm (0.0039 – 0.0244 in.)	
	MAX:	0.62 mm (0.0244 in.)	
6th gear thrust clearance	STD:	0.009 – 0.050 mm (0.0004 – 0.0020 in.)	
	MAX:	0.050 mm (0.0020 in.)	

5th gear radial clearance	STD: MAX:	0.015 – 0.056 mm (0.0006 – 0.0022 in.) 0.056 mm (0.0022 in.)
Synchronizer ring No.3 back and 5th gear spline end clearance	STD: Min:	0.75 – 1.65 mm (0.0295 – 0.065 in.) 1.65 mm (0.065 in.)
Transmission hub sleeve No.3 and gear shift fork No.3 clearance	STD:	0.31 – 0.89 mm (0.0122 – 0.035 in.)
6th gear inner diameter	STD: MAX:	28.015 – 28.031mm (1.1030 – 1.1036 in.) 28.031mm (1.1036 in.)
5th gear inner diameter	STD: MAX:	29.915 – 29.931mm (1.1778 – 1.1784 in.) 29.931mm (1.1784 in.)
Reverse idler gear sub-assy inner diameter	STD: MAX:	18.040 – 18.058 mm (0.7102 – 0.7109 in.) 18.058 mm (0.7109 in.)
Reverse idler gear shaft outer diameter	STD: Min:	17.966 – 17.984 mm (0.7073 – 0.7080 in.) 17.966 mm (0.7073 in.)
Front transaxle case oil seal drive in depth		15.6 – 16.0 mm (0.6142 – 0.6299 in.)
Input shaft front bearing drive in depth		0 – 0.3 mm (0 – 0.012 in.)
Front differential case tapered roller bearing preload	New bearing Used bearing	0.78 – 1.57 N-m (8 – 16 kgf-cm, 7 – 14 in.-lbf) 0.49 – 0.98 N-m (5 – 10 kgf-cm, 4 – 9 in.-lbf)
Front differential case shim thickness	AA: BB: CC: DD: EE: FF: GG: HH: JJ: KK: LL: MM: NN: PP: QQ: RR: SS: TT: UU:	2.10 mm (0.0827 in.) 2.15 mm (0.0846 in.) 2.20 mm (0.0866 in.) 2.25 mm (0.0886 in.) 2.30 mm (0.0906 in.) 2.35 mm (0.0925 in.) 2.40 mm (0.0945 in.) 2.45 mm (0.0965 in.) 2.50 mm (0.0984 in.) 2.55 mm (0.1004 in.) 2.60 mm (0.1024 in.) 2.65 mm (0.1043 in.) 2.70 mm (0.1063 in.) 2.75 mm (0.1083 in.) 2.80 mm (0.1102 in.) 2.85 mm (0.1122 in.) 2.90 mm (0.1142 in.) 2.95 mm (0.1161 in.) 3.00 mm (0.1181 in.)
Transmission case oil seal drive in depth		9.9 ± 0.3 mm (0.390 ± 0.012 in.)
Transaxle case oil seal drive in depth		1.9 ± 0.3 mm (0.075 ± 0.012 in.)
Reverse restrict pin slotted pin drive in depth		15.5 ± 16.5 mm (0.6102 ± 0.6496 in.)
Transmission clutch hub No.3 snap ring clearance		0.1 mm or less (0.004 in. or less)
Transmission clutch hub No.3 snap ring thickness	A: B: C: D: E: F: G: H: J:	1.75 mm (0.0689 in.) 1.80 mm (0.0709 in.) 1.85 mm (0.0728 in.) 1.90 mm (0.0748 in.) 1.95 mm (0.0768 in.) 2.00 mm (0.0787 in.) 2.05 mm (0.0807 in.) 2.10 mm (0.0827 in.) 2.15 mm (0.0846 in.)
Input shaft radial ball bearing snap ring clearance		0.1 mm or less (0.004 in. or less)

SERVICE SPECIFICATIONS – MANUAL TRANSMISSION / TRANSAXLE

Input shaft radial ball bearing snap ring thickness	A: B: C: D: E: F: G: H: J: K: L: M:	1.70 mm (0.0669 in.) 1.75 mm (0.0689 in.) 1.80 mm (0.0709 in.) 1.85 mm (0.0728 in.) 1.90 mm (0.0748 in.) 1.95 mm (0.0768 in.) 2.00 mm (0.0787 in.) 2.05 mm (0.0807 in.) 2.10 mm (0.0827 in.) 2.15 mm (0.0846 in.) 2.20 mm (0.0866 in.) 2.25 mm (0.0886 in.)
Output shaft radial ball bearing snap ring clearance		0.1 mm or less (0.004 in. or less)
Output shaft radial ball bearing snap ring thickness	B: C: D: E: F: G: H: J: K: L: M:	2.31 mm (0.0909 in.) 2.37 mm (0.0933 in.) 2.43 mm (0.0957 in.) 2.49 mm (0.0980 in.) 2.55 mm (0.1004 in.) 2.61 mm (0.1028 in.) 2.67 mm (0.1051 in.) 2.73 mm (0.1075 in.) 2.79 mm (0.1098 in.) 2.85 mm (0.1122 in.) 2.91 mm (0.1146 in.)
INPUT SHAFT ASSY (C59)		
4th gear thrust clearance	STD: MAX:	0.10 – 0.55 mm (0.0039 – 0.0217 in.) 0.55 mm (0.0217 in.)
3rd gear thrust clearance	STD: MAX:	0.10 – 0.35 mm (0.0039 – 0.0138 in.) 0.35 mm (0.0138 in.)
4th gear radial clearance	KOYO made STD: MAX: NSK made STD: MAX:	0.015 – 0.058 mm (0.0006 – 0.0023 in.) 0.058 mm (0.0023 in.) 0.015 – 0.056 mm (0.0006 – 0.0022 in.) 0.056 mm (0.0022 in.)
3rd gear radial clearance	KOYO made STD: MAX: NSK made STD: MAX:	0.015 – 0.058 mm (0.0006 – 0.0023 in.) 0.058 mm (0.0023 in.) 0.015 – 0.056 mm (0.0006 – 0.0022 in.) 0.056 mm (0.0022 in.)
Input shaft run out	MAX:	0.015 mm (0.0006 in.)
Input shaft outer diameter	STD: A B C D Min: A B C D	24.885 – 24.900 mm (0.9797 – 0.9803 in.) 28.985 – 29.000 mm (1.1411 – 1.1417 in.) 30.985 – 31.000 mm (1.2198 – 1.2204 in.) 24.985 – 25.000 mm (0.9836 – 0.9842 in.) 24.885 mm (0.9797 in.) 28.985 mm (1.1411 in.) 30.985 mm (1.2198 in.) 24.985 mm (0.9836 in.)
4th gear inside diameter	STD: MAX:	34.015 – 34.031 mm (1.3391 – 1.3398 in.) 34.031 mm (1.3398 in.)
3rd gear inside diameter	STD: MAX:	36.015 – 36.031 mm (1.4179 – 1.4185 in.) 36.031 mm (1.4185 in.)
3rd gear synchronizer ring back and 3rd gear spline end clearance	Min:	0.65 mm (0.0256 in.)
4th gear synchronizer ring back and 3rd gear spline end clearance	Min:	0.75 mm (0.0295 in.)
Gear shift fork No.2 claw and glove of the transmission hub sleeve No.2 clearance		0.15 – 0.35 mm (0.0059 – 0.0137 in.)
Transmission clutch hub No.2 snap ring thickness	0: 1: 2: 3: 4: 5:	2.30 mm (0.0906 in.) 2.36 mm (0.0929 in.) 2.42 mm (0.0953 in.) 2.48 mm (0.0976 in.) 2.54 mm (0.1000 in.) 2.60 mm (0.1024 in.)

Input shaft rear radial ball bearing snap ring	0:	2.29 mm (0.0901 in.)
	1:	2.35 mm (0.0925 in.)
	2:	2.41 mm (0.0948 in.)
	3:	2.47 mm (0.0972 in.)
	4:	2.53 mm (0.0996 in.)
	5:	2.59 mm (0.1019 in.)
INPUT SHAFT ASSY (C60)		
4th gear thrust clearance	STD:	0.10 – 0.55 mm (0.0039 – 0.0217 in.)
3rd gear thrust clearance	STD:	0.10 – 0.35 mm (0.0039 – 0.0138 in.)
4th gear radial clearance	KOYO made:	0.015 – 0.058 mm (0.0006 – 0.0023 in.)
	NSK made:	0.015 – 0.056 mm (0.0006 – 0.0022 in.)
3rd gear radial clearance	KOYO made:	0.015 – 0.058 mm (0.0006 – 0.0023 in.)
	NSK made STD:	0.015 – 0.056 mm (0.0006 – 0.0022 in.)
Input shaft run out	MAX:	0.015 mm (0.0006 in.)
Input shaft outer diameter	New shaft part A:	A: 21.991 – 21.006 mm (0.8658 – 0.8270 in.)
		B: 24.885 – 24.900 mm (0.9797 – 0.9803 in.)
		C: 28.985 – 29.000 mm (1.1411 – 1.1417 in.)
		D: 30.985 – 31.000 mm (1.2199 – 1.2205 in.)
	Min part A:	A: 21.991 mm (0.8658 in.)
		B: 24.885 mm (0.9797 in.)
		C: 28.985 mm (1.1411 in.)
		D: 30.985 mm (1.2199 in.)
4th gear inside diameter	STD:	34.015 – 34.031 mm (1.3391 – 1.3398 in.)
	MAX:	34.031 mm (1.3398 in.)
3rd gear inside diameter	STD:	36.015 – 36.031 mm (1.4179 – 1.4185 in.)
	MAX:	36.031 mm (1.4185 in.)
3rd gear synchronizer ring back and 3rd gear spline end clearance	Min:	0.65 mm (0.0256 in.)
4th gear synchronizer ring back and 3rd gear spline end clearance	Min:	0.75 mm (0.0295 in.)
Gear shift fork No.2 claw and glove of the transmission hub sleeve No.2 clearance		0.15 – 0.35 mm (0.0059 – 0.0137 in.)
Transmission clutch hub No.2 snap ring clearance		0.1 mm (0.004 in.) or less
Transmission clutch hub No.2 snap ring thickness	0:	2.30 mm (0.0906 in.)
	1:	2.36 mm (0.0929 in.)
	2:	2.42 mm (0.0953 in.)
	3:	2.48 mm (0.0976 in.)
	4:	2.54 mm (0.1000 in.)
	5:	2.60 mm (0.1024 in.)
Input shaft bearing snap ring clearance		0.1 mm (0.004 in.) or less
Input shaft rear radial ball bearing snap ring	0:	2.29 mm (0.0901 in.)
	1:	2.35 mm (0.0925 in.)
	2:	2.41 mm (0.0948 in.)
	3:	2.47 mm (0.0972 in.)
	4:	2.53 mm (0.0996 in.)
	5:	2.59 mm (0.1019 in.)
OUTPUT SHAFT ASSY (C59)		
1st gear thrust clearance	STD:	0.10 – 0.40 mm (0.0039 – 0.0157 in.)
2nd gear thrust clearance	STD:	0.10 – 0.45 mm (0.0039 – 0.0177 in.)
1st gear radial clearance	KOYO made:	0.015 – 0.058 mm (0.0006 – 0.0023 in.)
	NSK made:	0.015 – 0.056 mm (0.0006 – 0.0022 in.)
1st gear radial clearance	KOYO made:	0.015 – 0.058 mm (0.0006 – 0.0023 in.)
	NSK made:	0.015 – 0.056 mm (0.0006 – 0.0022 in.)
Output shaft maximum run out		0.015 mm (0.0006 in.)
Output shaft outer diameter	Part: A	31.985 mm (1.2592 in.)
	B	37.985 mm (1.4955 in.)
	C	32.985 mm (1.2986 in.)
2nd gear inside diameter	New:	38.015 – 38.031 mm (1.4967 – 1.4973 in.)
	MAX:	38.031 mm (1.4973 in.)

SERVICE SPECIFICATIONS – MANUAL TRANSMISSION / TRANSAXLE

1st gear inside diameter	New: MAX:	44.015 – 44.031 mm (1.7329 – 1.7335 in.) 44.031 mm (1.7335 in.)
1st gear thrust washer thickness	New: Min:	5.975 – 6.025 mm (0.2352 – 0.2372 in.) 5.975 mm (0.2352 in.)
Synchronizer ring set No.2 back and 2nd gear spline end clearance		0.7 – 1.3 mm (0.0276 – 0.0512 in.)
Synchronizer ring set No.1 back and 2nd gear spline end clearance		0.75 – 1.65 mm (0.0295 – 0.065 in.)
Reverse gear glove and reverse gear shift fork claw clearance		0.15 – 0.35 mm (0.0059 – 0.0138 in.)
Output shaft front bearing snap ring thickness	7: 8: 1: 2: 3: 4: 5: 6:	1.85 – 1.90 mm (0.728 – 0.0748 in.) 1.90 – 1.95 mm (0.748 – 0.0768 in.) 1.95 – 2.00 mm (0.768 – 0.0787 in.) 2.00 – 2.05 mm (0.787 – 0.0807 in.) 2.05 – 2.10 mm (0.807 – 0.0827 in.) 2.10 – 2.15 mm (0.827 – 0.0846 in.) 2.15 – 2.20 mm (0.846 – 0.0866 in.) 2.20 – 2.25 mm (0.866 – 0.0886 in.)
Transmission clutch hub No.1 snap ring thickness	A: B: C: D: E: F:	2.50 mm (0.0984 in.) 2.56 mm (0.1008 in.) 2.62 mm (0.1031 in.) 2.68 mm (0.1055 in.) 2.74 mm (0.1079 in.) 2.80 mm (0.1102 in.)
OUTPUT SHAFT ASSY (C60)		
1st gear thrust clearance	STD:	0.10 – 0.40 mm (0.0039 – 0.0157 in.)
2nd gear thrust clearance	STD:	0.10 – 0.55 mm (0.0039 – 0.0217 in.)
1st gear radial clearance	KOYO made: NSK made:	0.015 – 0.058 mm (0.0006 – 0.0023 in.) 0.015 – 0.056 mm (0.0006 – 0.0022 in.)
1st gear radial clearance	KOYO made: NSK made:	0.015 – 0.058 mm (0.0006 – 0.0023 in.) 0.015 – 0.056 mm (0.0006 – 0.0022 in.)
Output shaft maximum run out		0.015 mm (0.0006 in.)
Output shaft outer diameter	New shaft A: B: Min A: B:	31.985 – 32.000 mm (1.2592 – 1.2598 in.) 37.985 – 38.000 mm (1.4955 – 1.4961 in.) 31.985 mm (1.2592 in.) 37.985 mm (1.4955 in.)
2nd gear inside diameter	New: MAX:	38.015 – 38.031 mm (1.4967 – 1.4973 in.) 38.031 mm (1.4973 in.)
1st gear inside diameter	New: MAX:	44.015 – 44.031 mm (1.7329 – 1.7335 in.) 44.031 mm (1.7335 in.)
1st gear thrust washer thickness	New: Min:	5.975 – 6.025 mm (0.2352 – 0.2372 in.) 5.975 mm (0.2352 in.)
Synchronizer ring set No.2 back and 2nd gear spline end clearance		0.7 – 1.3 mm (0.0276 – 0.0512 in.)
Synchronizer ring set No.1 back and 2nd gear spline end clearance		0.75 – 1.65 mm (0.0295 – 0.065 in.)
Reverse gear glove and reverse gear shift fork claw clearance		0.15 – 0.35 mm (0.0059 – 0.0138 in.)
Transmission clutch hub No.1 snap ring clearance		0.1 mm (0.004 in.) or less
Transmission clutch hub No.1 snap ring thickness	A: B: C: D: E: F:	2.50 mm (0.0984 in.) 2.56 mm (0.1008 in.) 2.62 mm (0.1031 in.) 2.68 mm (0.1055 in.) 2.74 mm (0.1079 in.) 2.80 mm (0.1102 in.)
DIFFERENTIAL CASE ASSY (MTM)		
Front differential side gear backlash		0.05 – 0.20 mm (0.0020 – 0.0079 in.)
Front differential pinion thrust washer thickness		0.92 mm (0.0362 in.)
Front differential pinion shaft No.1 outer diameter		16.982 mm (0.6686 in.)

Front differential side gear thrust washer	0.95 mm (0.0374 in.) 1.00 mm (0.0394 in.) 1.05 mm (0.0413 in.) 1.10 mm (0.0433 in.) 1.15 mm (0.0453 in.) 1.20 mm (0.0472 in.)
SHIFT & SELECT LEVER SHAFT ASSY (C59)	
Control shaft cover oil seal drive in depth	0.7 ± 0.5 mm (0.0276 ± 0.0197 in.)
Select inner lever slotted pin drive in depth	3.0 – 4.0 mm (0.1181 – 0.1575 in.)
Shift lever inner No.1 slotted pin drive in depth	0 ± 0.5 mm (0 ± 0.0197 in.)
Shift lever inner No.2 slotted pin drive in depth	0 ± 0.5 mm (0 ± 0.0197 in.)
SHIFT & SELECT LEVER SHAFT ASSY (C60)	
Control shaft cover oil seal drive in depth	0.7 ± 0.5 mm (0.0276 ± 0.0197 in.)
Shift lever inner No.1 slotted pin drive in depth	0 ± 0.5 mm (0 ± 0.0197 in.)
Shift lever inner No.2 slotted pin drive in depth	3.5 ± 0.5 mm (0.1378 ± 0.0197 in.)