

# RA60F MANUAL TRANSMISSION

## SERVICE DATA

Reverse idler gear thrust clearance	STD: MAX:	0.10 to 0.55 mm (0.0039 to 0.0217 in.) 0.55 mm (0.0217 in.)
Reverse idler gear radial clearance	STD: MAX:	0.015 to 0.050 mm (0.0006 to 0.0020 in.) 0.050 mm (0.0020 in.)
Slotted pin drive in depth	-	0 to 0.5 mm (0 to 0.050 in.)
Transmission case oil seal dimension A	-	60.0 to 60.8 mm (2.362 to 2.394 in.)
Preload	-	0.45 to 1.35 N*m (4.59 to 13.77 kgf*cm, 3.98 to 11.95 in.*lbf)
Manual Transmission extension housing oil seal dimension A	-	- 0.5 to 0.5 mm (- 0.197 to 0.197 in.)
6th gear thrust clearance	-	0.20 to 0.49 mm (0.0079 to 0.0193 in.)
3rd gear thrust clearance	-	0.09 to 0.52 mm (0.0035 to 0.0205 in.)
4th gear thrust clearance	-	0.12 to 0.38 mm (0.0047 to 0.0150 in.)
6th gear radial clearance	-	0.015 to 0.065 mm (0.0006 to 0.0026 in.)
3rd gear radial clearance	-	0.015 to 0.067 mm (0.0006 to 0.0026 in.)
4th gear radial clearance	-	0.015 to 0.067 mm (0.0006 to 0.0026 in.)
Input shaft runout	MAX:	0.03 mm (0.0012 in.)
Input shaft outer diameter	STD: A B C D E MIN: A B C D E	34.002 to 34.015 mm (1.3387 to 1.3392 in.) 44.985 to 45.000 mm (1.7711 to 1.7717 in.) 44.985 to 45.000 mm (1.7711 to 1.7717 in.) 41.985 to 42.000 mm (1.6530 to 1.6535 in.) 32.967 to 32.980 mm (1.2979 to 1.2984 in.) 34.002 mm (1.3387 in.) 44.985 mm (1.7711 in.) 44.985 mm (1.7711 in.) 41.985 mm (1.6530 in.) 32.967 mm (1.2979 in.)
6th gear inside diameter	STD: MAX:	51.015 to 51.040 mm (2.0085 to 2.0095 in.) 51.040 mm (2.0095 in.)
3rd gear inside diameter	STD: MAX:	51.015 to 51.040 mm (2.0085 to 2.0095 in.) 51.040 mm (2.0095 in.)
4th gear inside diameter	STD: MAX:	51.015 to 51.040 mm (2.0085 to 2.0095 in.) 51.040 mm (2.0095 in.)
Gear shift fork No. 2 or No. 3 claw and glove of the transmission hub sleeve No. 2 clearance	-	0.26 to 0.84 mm (0.0102 to 0.0331 in.)
6th gear synchronizer ring back and 6th gear spline end clearance	STD: MIN:	0.70 to 1.50 mm (0.0276 to 0.0591 in.) 0.70 mm (0.0276 in.)
3rd gear synchronizer ring back and 3rd gear spline end clearance	STD: Inner Middle Outer MIN: Inner Middle Outer	1.20 to 2.20 mm (0.0472 to 0.0866 in.) 0.60 to 1.80 mm (0.0236 to 0.0709 in.) 0.80 to 1.80 mm (0.0315 to 0.0709 in.) 1.20 mm (0.0472 in.) 0.60 mm (0.0236 in.) 0.80 mm (0.0315 in.)
6th gear synchronizer ring back and 6th gear spline end clearance	STD: MIN:	0.70 to 1.50 mm (0.0276 to 0.0591 in.) 0.70 mm (0.0276 in.)
3rd gear thrust washer thickness	STD: MIN:	7.12 to 7.18 mm (0.2803 to 0.2827 in.) 7.12 mm (0.2803 in.)
Input shaft front bearing snap ring	Mark A B C D E F	2.65 to 2.70 mm (0.1043 to 0.1063 in.) 2.70 to 2.75 mm (0.1063 to 0.1083 in.) 2.75 to 2.80 mm (0.1083 to 0.1102 in.) 2.80 to 2.85 mm (0.1102 to 0.1122 in.) 2.85 to 2.90 mm (0.1122 to 0.1142 in.) 2.90 to 2.95 mm (0.1142 to 0.1161 in.)

Clutch hub No. 2 setting shaft snap ring	Mark A B C D E F G	1.77 to 1.82 mm (0.0697 to 0.0717 in.) 1.82 to 1.87 mm (0.0717 to 0.0736 in.) 1.87 to 1.92 mm (0.0736 to 0.0756 in.) 1.92 to 1.97 mm (0.0756 to 0.0776 in.) 1.97 to 2.02 mm (0.0776 to 0.0795 in.) 2.02 to 2.07 mm (0.0795 to 0.0815 in.) 2.07 to 2.12 mm (0.0815 to 0.0835 in.)
Gear thrust washer shaft snap ring	Mark A B C D E F	2.07 to 2.12 mm (0.0815 to 0.0835 in.) 2.12 to 2.17 mm (0.0835 to 0.0854 in.) 2.17 to 2.22 mm (0.0854 to 0.0874 in.) 2.22 to 2.27 mm (0.0874 to 0.0894 in.) 2.27 to 2.32 mm (0.0894 to 0.0913 in.) 2.32 to 2.37 mm (0.0913 to 0.0933 in.)
Transmission clutch hub No. 3 shaft snap ring	Mark A B C D E F G	2.10 to 2.15 mm (0.0827 to 0.0847 in.) 2.15 to 2.20 mm (0.0847 to 0.0866 in.) 2.20 to 2.25 mm (0.0866 to 0.0886 in.) 2.25 to 2.30 mm (0.0886 to 0.0906 in.) 2.30 to 2.35 mm (0.0906 to 0.0925 in.) 2.35 to 2.40 mm (0.0925 to 0.0945 in.) 2.40 to 2.45 mm (0.0945 to 0.0965 in.)
Output shaft inside diameter	STD: MAX:	45.009 to 45.025 mm (1.7720 to 1.7726 in.) 45.025 mm (1.7726 in.)
Synchronizer ring back and gear spline end clearance	STD: MIN:	0.70 to 1.50 mm (0.0276 to 0.0591 in.) 0.70 mm (0.0276 in.)
Reverse gear thrust clearance	-	0.12 to 0.37 mm (0.0047 to 0.0146 in.)
1st gear thrust clearance	-	0.10 to 0.43 mm (0.0039 to 0.0169 in.)
2nd gear thrust clearance	-	0.10 to 0.43 mm (0.0039 to 0.0169 in.)
Reverse gear radial clearance	-	0.015 to 0.065 mm (0.0006 to 0.0026 in.)
1st gear radial clearance	-	0.015 to 0.067 mm (0.0006 to 0.0026 in.)
2nd gear radial clearance	-	0.015 to 0.067 mm (0.0006 to 0.0026 in.)
Counter gear runout	MAX:	0.03 mm (0.0012 in.)
Counter gear outer diameter	STD: A B C D E MIN: A B C D E	34.002 to 34.015 mm (1.3387 to 1.3392 in.) 36.985 to 37.000 mm (1.4561 to 1.4567 in.) 47.985 to 48.000 mm (1.8892 to 1.8898 in.) 53.985 to 54.000 mm (2.1254 to 2.1260 in.) 34.002 to 34.015 mm (1.3387 to 1.3392 in.) 34.002 mm (1.3387 in.) 36.985 mm (1.4561 in.) 47.985 mm (1.8892 in.) 53.985 mm (2.1254 in.) 34.002 mm (1.3387 in.)
Reverse gear inside diameter	STD: MAX:	51.015 to 51.040 mm (2.0085 to 2.0095 in.) 51.040 mm (2.0095 in.)
1st gear inside diameter	STD: MAX:	54.015 to 54.040 mm (2.1266 to 2.1276 in.) 54.040 mm (2.1276 in.)
2nd gear inside diameter	STD: MAX:	60.015 to 60.040 mm (2.3628 to 2.3638 in.) 60.040 mm (2.3638 in.)
Gear shift fork No. 4 claw and glove of the transmission hub sleeve No. 3 clearance	-	0.26 to 0.84 mm (0.0102 to 0.0331 in.)
Gear shift fork No. 1 claw and glove of the transmission hub sleeve No. 1 clearance	-	0.15 to 0.35 mm (0.0059 to 0.0138 in.)
Reverse gear synchronizer ring back and reverse gear spline end clearance	STD: MIN:	0.70 to 1.30 mm (0.0276 to 0.0512 in.) 0.70 mm (0.0276 in.)
1st gear synchronizer ring back and 1st gear spline end clearance	STD: Inner Middle Outer MIN: Inner Middle Outer	1.48 to 2.12 mm (0.0583 to 0.0835 in.) 0.68 to 1.92 mm (0.0268 to 0.0756 in.) 0.88 to 1.72 mm (0.0346 to 0.0677 in.) 1.48 mm (0.0583 in.) 0.68 mm (0.0268 in.) 0.88 mm (0.0346 in.)



2nd gear synchronizer ring back and 2nd gear spline end clearance	STD: Inner Middle Outer MIN: Inner Middle Outer	1.48 to 2.12 mm (0.0583 to 0.0835 in.) 0.68 to 1.92 mm (0.0268 to 0.0756 in.) 0.88 to 1.72 mm (0.0346 to 0.0677 in.) 1.48 mm (0.0583 in.) 0.68 mm (0.0268 in.) 0.88 mm (0.0346 in.)
Counter gear rear bearing snap ring	Mark A B C D E F G H J K L M	2.35 to 2.40 mm (0.0925 to 0.0945 in.) 2.40 to 2.45 mm (0.0945 to 0.0965 in.) 2.45 to 2.50 mm (0.0965 to 0.0984 in.) 2.50 to 2.55 mm (0.0984 to 0.1004 in.) 2.55 to 2.60 mm (0.1004 to 0.1024 in.) 2.60 to 2.65 mm (0.1024 to 0.1043 in.) 2.65 to 2.70 mm (0.1043 to 0.1063 in.) 2.70 to 2.75 mm (0.1063 to 0.1083 in.) 2.75 to 2.80 mm (0.1083 to 0.1102 in.) 2.80 to 2.85 mm (0.1102 to 0.1122 in.) 2.85 to 2.90 mm (0.1122 to 0.1142 in.) 2.90 to 2.95 mm (0.1142 to 0.1161 in.)
Clutch hub No. 1 shaft snap ring	Mark A B C D E F G	2.28 to 2.33 mm (0.0898 to 0.0917 in.) 2.33 to 2.38 mm (0.0917 to 0.0937 in.) 2.38 to 2.43 mm (0.0937 to 0.0957 in.) 2.43 to 2.48 mm (0.0957 to 0.0976 in.) 2.48 to 2.53 mm (0.0976 to 0.0996 in.) 2.53 to 2.58 mm (0.0996 to 0.1016 in.) 2.58 to 2.63 mm (0.1016 to 0.1035 in.)
Counter gear front bearing snap ring	Mark A B C D E F G H J K L M	2.35 to 2.40 mm (0.0925 to 0.0945 in.) 2.40 to 2.45 mm (0.0945 to 0.0965 in.) 2.45 to 2.50 mm (0.0965 to 0.0984 in.) 2.50 to 2.55 mm (0.0984 to 0.1004 in.) 2.55 to 2.60 mm (0.1004 to 0.1024 in.) 2.60 to 2.65 mm (0.1024 to 0.1043 in.) 2.65 to 2.70 mm (0.1043 to 0.1063 in.) 2.70 to 2.75 mm (0.1063 to 0.1083 in.) 2.75 to 2.80 mm (0.1083 to 0.1102 in.) 2.80 to 2.85 mm (0.1102 to 0.1122 in.) 2.85 to 2.90 mm (0.1122 to 0.1142 in.) 2.90 to 2.95 mm (0.1142 to 0.1161 in.)