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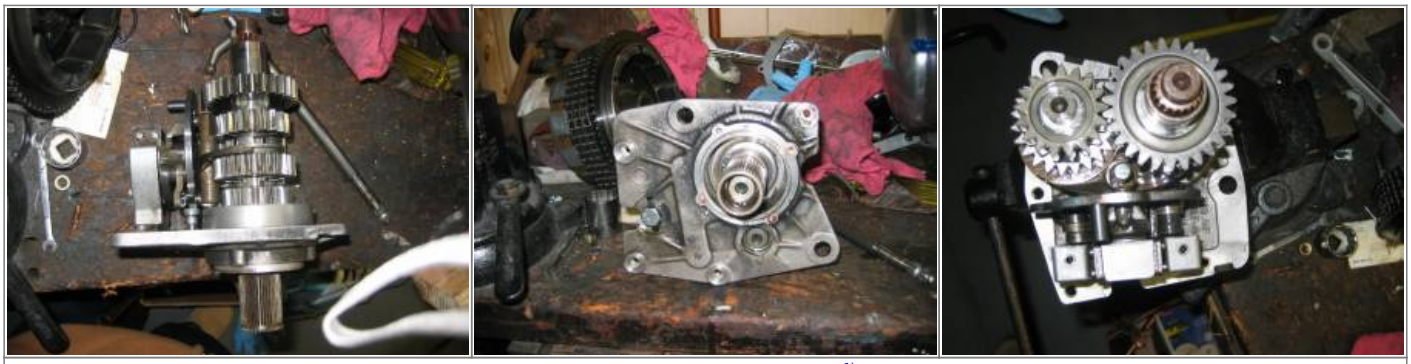
EVO: Transmission & Final Drive

Click here for tips on 4 Speed Transmission Removal / Inspection / Installation

1986-1990 4-Speed Constant Mesh Wet Clutch Transmission w/Trapdoor

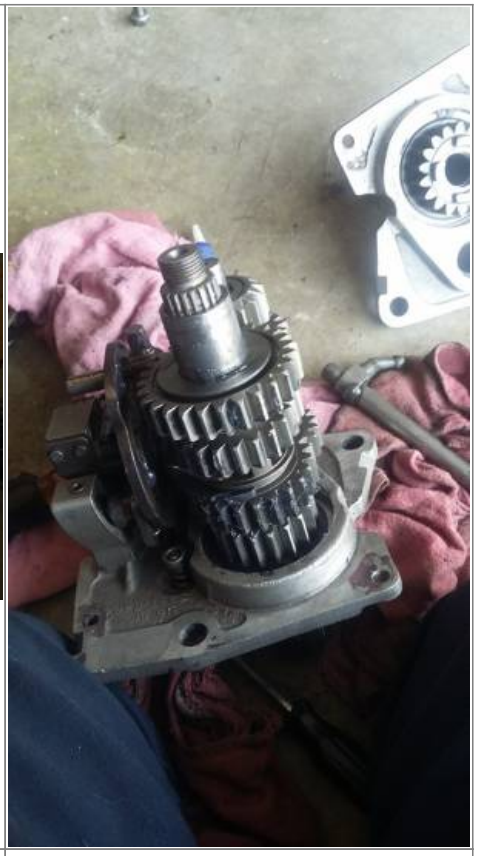
- The rear compartment of the left and right engine case halves form the transmission housing or case. An access cover, or trapdoor, is mounted on the left side of the case (inside) behind the primary cover. The main components of the transmission are mounted to this trapdoor to allow you to detach the one cover (together with all the transmission components) for easy removal and servicing without having to split the engine cases in half which otherwise would be a full engine re-build.



1990 4 Speed Transmission [1)]



1990 4 Speed Transmission [2)]


1988 4 Speed by WI_duker))

Specifications

Clutch

1986-1990 Wet Clutch Information [3)]		
Clutch plate thickness	–Friction (drive) plate (fiber)	0.0150 in. (± 0.0031 in.) / 3.810 mm (± 0.079 mm)
	–Steel plate (driven) plate	0.0629 in. (± 0.0020 in.) / 1.598 mm (± 0.51 mm)
Minimum Thickness (wear limit)	–Friction (fiber) plate	0.130 in. min. / (3.302 mm)
	–Steel plate	0.060 in. min. / (0.0254 mm)
Maximum allowable warp-age	–Friction (fiber) plate	0.0010 in. max. / (0.0254 mm)
	–Steel plate	0.0010 in. max./ (0.0254 mm)
Capacity	174 ft-lbs	
Spring Force	Engaged: 304 lbs	Disengaged: 260 lbs
Clutch shell bearing on clutch gear (loose)	0.0000 in-0.0010 in. / (0.0254 mm)	

Primary Drive (engine to transmission)

Year	Domestic Model(s)	Engine Sprocket	Clutch Sprocket	Ratio
1986-1990	All Models[4)]	34 Teeth	59 Teeth	1.676:1

Primary / Transmission Oil Capacities

The MoCo publishes for 1986-1990 [5)]	1.5 pints (24 oz), (710 ml)

* This quantity is for a dry application. When changing oil, use your own judgement not to overfill as you won't need a full 1.5 pints to re-fill the oil.

Transmission

- Internal Gear Ratios are the number of clutch gear revolutions to drive the mainshaft sprocket one revolution.
- Overall Gear Ratios are the number of engine revolutions to drive rear wheel one revolution.

Year (all models)	Internal Gear Ratios			
	1st	2nd	3rd	4th
1986	2.52	1.82	1.38	1.00
1987-1990	2.29	1.66	1.25	1.00
Year (all models)	**Overall Gear Ratios**			
	1st	2nd	3rd	4th
1986	10.00	7.25	5.48	3.97
1987-1990	9.12	6.59	4.98	3.97

Clutch Gear Mainshaft Ball Bearing

1986-1990 Mainshaft Ball Bearing - Used on All Models [6)]

- 9025A - Ball Bearing

Final Drive (Trans to Wheel)

Final Drive Sprocket Torque (on Chain Drive Models)			
Nut Description	**Nut Size**	**Tightening Torque**	**Notes**
1986-90	1-1/8“ Nut - Right-hand Threads	35-64 ft-lbs	Max 90ft-lbs
(use only 2 or 3 drops of RED threadlocker on this nut)			

Year	Domestic Model(s)	Transmission Sprocket	Rear Wheel Sprocket	Ratio
1986-1990	All Models[7)]	21 Teeth	48 Teeth	2.29:1

Fastener Torque Specs

Mainshaft nut locking screw	50 - 60 in-lbs.
Mainshaft nut	35 - 65 ft-lbs.
Engine sprocket nut	150 - 165 ft-lbs.
Drain plug	14 - 21 ft-lbs.
Front chaincase / primary cover screws	80 - 110 in-lbs.
Access \ Trapdoor cover bolts	14-19 ft-lbs.
Stator Torx nuts	30 - 40 in-lbs.
Footrest nut	24-36 ft-lbs.
Shift lever pinch-bolt	90 - 110 in-lbs.
Neutral indicator switch	3 - 5 ft-lbs.
Chain tensioner stud nut	8 - 12 ft lbs
Clutch release mechanism	22 - 30 in. lbs

Mainshaft Group

- Clutch gear ball bearing in access cover: .001 - .00012 in. loose
    - Wear limit: .0035 in.
- Ball bearing on clutch gear: .0009 in. max. tight
    - Wear limit: .001 in. loose
- Clutch gear needle bearing journal diameter: .7495 - .7500 in.
    - Wear limit: .7485 in.
- Mainshaft right side retained roller bearing: .0004 - .0015 in. loose
    - Wear limit: .0035 in. loose
- Mainshaft end play:
    - Minimum: .006 in. / Maximum .020 in.
- Mainshaft third gear on shaft: .0027 - .0038 in. loose
    - Wear limit: .004 loose
    - End play: .006 - .020 in.
- Clearance between clutch faces:
    - Mainshaft fourth gear and second gear: .040 min. - .080 in. max.
    - Mainshaft third gear and second gear: .040 min. - .080 in. max.

Countershaft Group

- Countershaft end bearings: Retained needle roller bearings
- Countershaft needle bearing journal diameter:
    - Access door side or end: .7500 - .7495 in.
        - Wear limit: .7490 in.
    - Right crankcase side or end: .6875 - .6870 in.
        - Wear limit: .6865 in.
- Bearing fit in case: Press fit
- Second gear on shaft:.001 - .0025 in. loose

- Low gear needle bearing journal diameter: .6875 - .6870 in.
  - Wear limit: .6865 in.
- Clearance between faces:
  - Countershaft low and third gear: .040 - .080 in. max.
  - Countershaft second gear and third gear: .040 - .080 in. max.
- Countershaft end play: .004 - .015 in. max.

Countershaft Low Gear Changes

Countershaft Low Gear -17T	Change Year	Model(s)	Notes
35760-84A Late 1984-1990 [8] [9]	Late 1984		

Discussion

1986-90 Evo Sportsters: What every owner should know but were afraid to ask
An __XLForum Thread__ By Four Speed

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