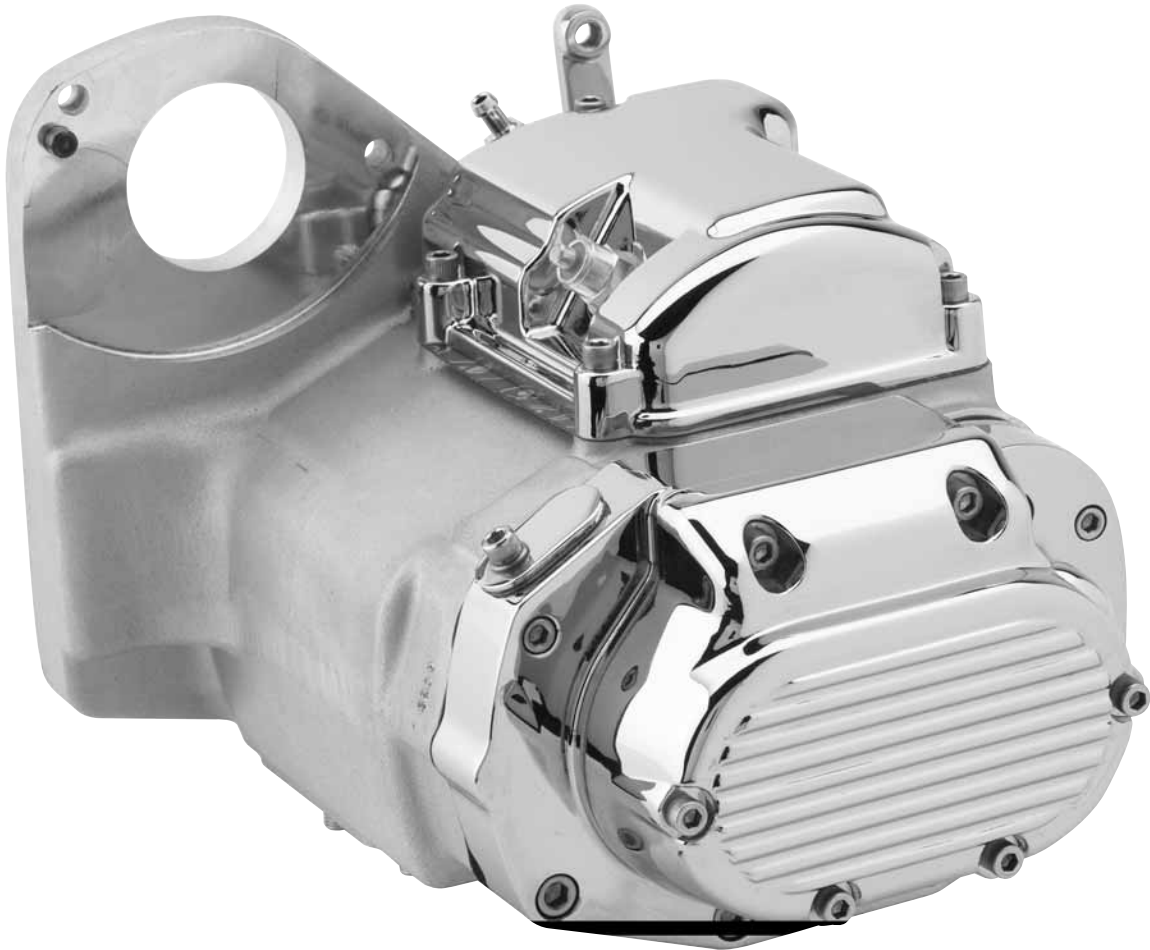




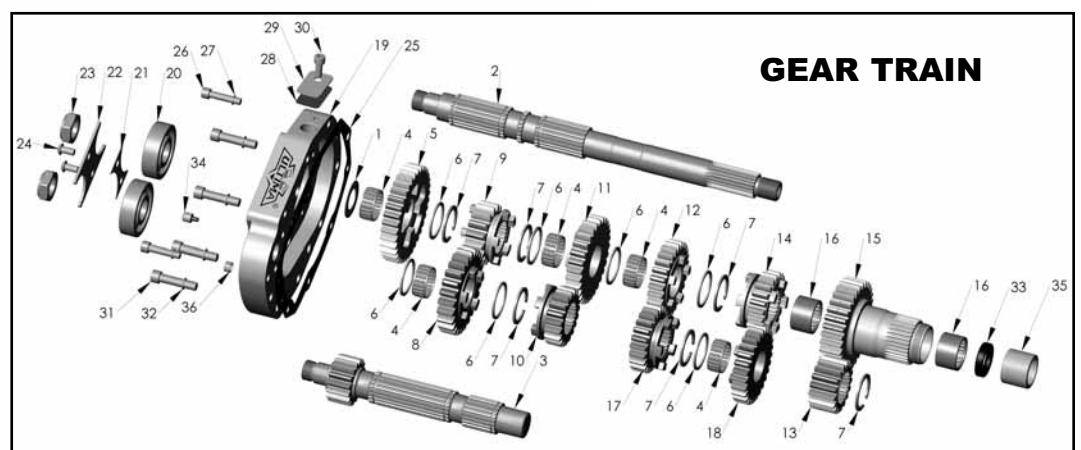
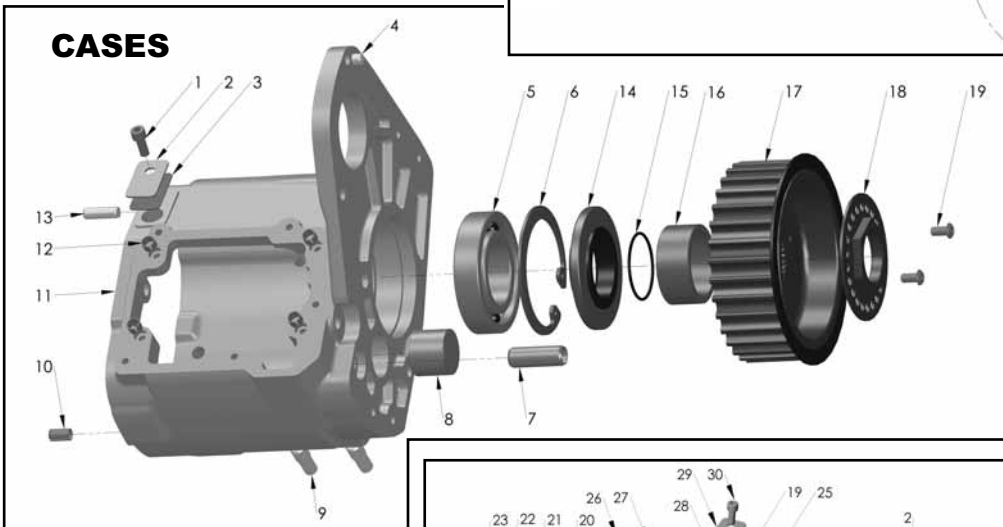
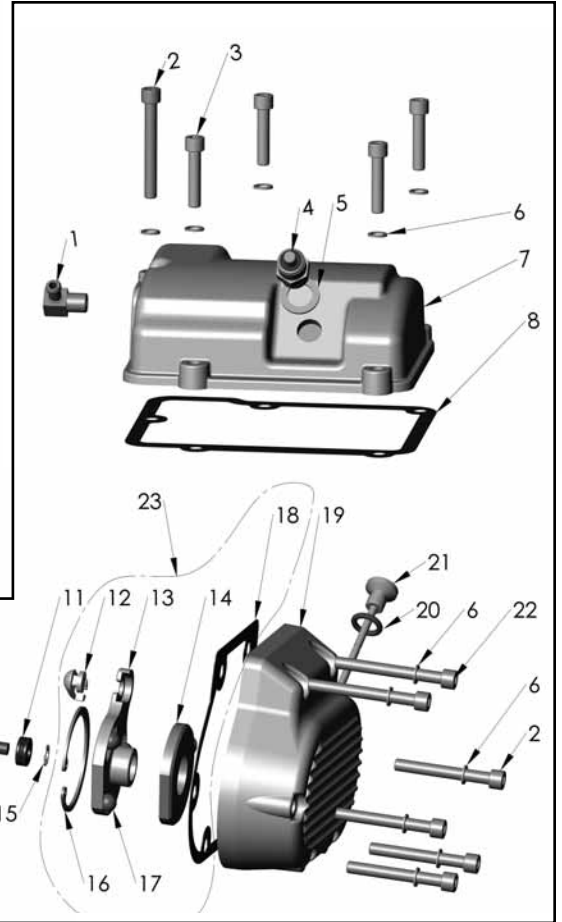
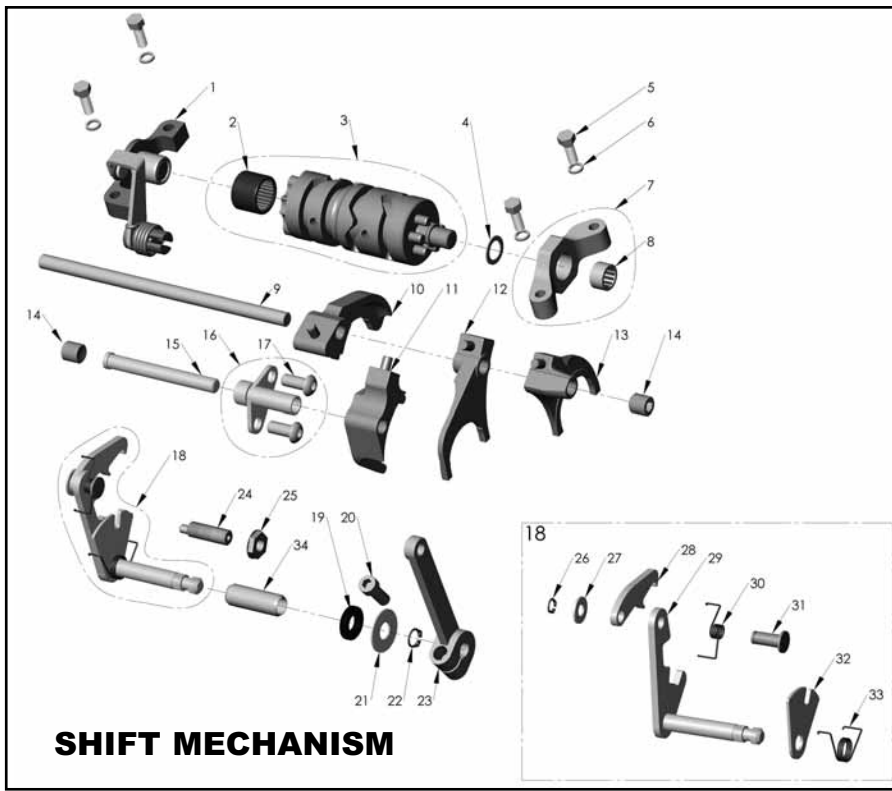
**ULTIMA 6 SPEED LSD
MANUAL
#201-57, #201-58, #201-59**



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Ultima recommends that these transmissions be serviced and maintained by a trained & qualified mechanic with knowledge of the Harley Davidson® style 5-speed transmission. Midwest MC Supply has no control over the judgement of others & assumes no responsibility or liability of any nature for the failure of others to use good judgement.



**SHIFT
MECHANISM**

Item Number	Part Number	Description	Quantity
1	98-934	Pillow Block, Detent Assembly	1
	96-888	Pillow Block Assembly, includes #7	1
2	95-372	Shifter Cam Bearing (OEM 36961-52)	1
3	98-936	Shift Cam, Late Model, includes # 2	1
4	98-938	Thrust Washer, Shift Drum, 0.040"	1
	98-939	Thrust Washer, Shift Drum, 0.008"	1
5	96-791	Bolt, Pillow Blocks, 1/4-20 x 1-1/4" (OEM 3993)	4
6	96-758	Washer, Pillow Blocks (OEM 6736)	4
7	96-696	Pillow Block (OEM 33326-79A), includes # 8	1
8	95-600	Shifter Cam Bearing, Left (OEM 9115)	1
9	96-638	Shaft, Shift Fork (OEM 34088-87)	1
10	96-899	Bronze Heavy Duty Replacement Shift Fork, Gear 1, Main Shaft	1
11	96-898	Bronze Heavy Duty Replacement Shift Fork, Gear 4, Counter Shaft	1
12	96-699	Steel Shift Fork, Gear 3, Counter Shaft (OEM 34191-79D)	1
	96-891	Bronze Heavy Duty Replacement Shift Fork, Gear 3, Counter Shaft (OEM 34191-79D)	1
13	96-700	Steel Shift Fork, Gear 2, Main Shaft (OEM 34193-79D)	1
	96-892	Bronze Heavy Duty Replacement Shift Fork, Gear 2, Main Shaft (OEM 34193-79D)	1
14	96-790	Set Screw 1/2-20 x1/2 (OEM 3784), (black anodized)	1
	96-940	Set Screw 1/2-20 x1/2 (OEM 3784),(chrome-plating)	1
15	98-937	Shaft, Shift Fork, Gear 4	1
16	98-923	Guide, Shift Fork Shaft, includes # 17	1
17	98-924	Bolts, Button Head, M8x1.25 x 20mm	2
18	96-674	Lever Assembly, Shifter Pawl	1
19	95-787	Seal, Shifter Shaft (OEM 12045)	1
20	96-941	Bolt, Shift Lever 5/16-24 x1" (OEM 856A)	1
21	96-757	Washer, Inner Shift Lever (OEM 6497HW)	1
22	96-760	Retaining Ring, Inner Shift Lever (OEM 11150)	1
23	96-652	Chrome Shift Rod Lever (OEM 33715-85)	1
24	96-680	Adjusting Screw (OEM 33119-79B)	1
25	96-681	Jam Nut, Adjuster (OEM 7515)	1
26	96-774	Retaining Ring (OEM 11016)	1
27	96-751	Washer (OEM 6016)	1
28	96-704	Shift Pawl (OEM 34086-79)	1
29	96-630	Shifter Shaft Lever (OEM 34084-86)	1
30	96-769	Spring (OEM 34083-79)	1
31	96-702	Pin (OEM 34082-79)	1
32	96-703	Plate (OEM 35068-79)	1
33	96-770	Spring (OEM 34087-79A)	1
34	96-755	Bushing, Shift Shaft (OEM 33114-79) See Transmission Case page	1

**TOP & SIDE
COVERS**

Item Number	Part Number	Description	Quantity
1	21-304	Vent Fitting, Chrome (OEM 62375-57)	1
2	96-955	Bolt, SHCS 1/4-20 x 2-1/2"	1
3	96-951	Bolt, SHCS 1/4-20 x 1" (OEM 4741A)	4
4	17-72	Neutral Light Switch ,Single Post(OEM 33900-59)	1
	17-701	Neutral Light Switch ,Dual Post, Silver(OEM 33902-98)	1
	17-702	Neutral Light Switch ,Dual Post, Black(OEM 33904-00)	1
5	96-754	Washer (OEM 33043-80)	1
6	96-952	Washer (0.410" OD., 0.250" ID.)	11
7	96-563	Top Cover, Transmission (OEM 34468-86A)	1
8	78-461	Gasket, Top Cover (34904-86)	1
9	96-538	Rod, Clutch Release, Center (OEM 37088-90). See Pushrods for sizes.	1
10	96-654	Rod, Clutch Release, Right (OEM 37069-90)	1
11	96-451	Throw-Out Bearing Assembly (OEM 37312-75, 37313-80)	1
12	96-788	Coupling (OEM 34920-86)	1
13	96-784	Inner Ramp (OEM 25452-87A)	1
14	96-785	Outer Ramp (OEM 25453-87A)	1
15	96-452	Retaining Ring (OEM 11096)	1
16	96-772	Retaining Ring (OEM 10998)	1
17	96-783	Steel Ball (OEM 8873)	3
18	78-455	Gasket, Side Cover (OEM 36801-87A)	1
19	96-554	End Cover, Transmission (OEM 37105-87A)	1
20	95-241	O-ring, Dip Stick (OEM11132)	1
21	41-285	Dip Stick	1
22	96-953	Bolt, SHCS 1/4-20UNC x 2	2
	96-954	Bolt, SHCS 1/4-20UNC x 2.25	2
	96-955	Bolt, SHCS 1/4-20UNC x 2.5	2
23	96-793	Clutch Release Kit, includes # 12,13,14,16,17(Qty: 3),and 18	1

CASES

CASE KITS: Complete with main bearing, retaining ring, counter shaft bearing, shift shaft bushing, case studs, and all alignment pins. Includes items 1 Thru 13.

- 298-108** Cast Finish
- 298-110** Cast Finish w/Speedo Hole
- 298-116** Polished Finish
- 298-112** Polished Finish w/Speedo Hole
- 298-107** Black Powder Coat

Item Number	Part Number	Description	Quantity
1	98-929	Screw, SHCS 1/4-20 x 7/16"	1
2	98-930	Cover Plate, Speedo Hole	1
3	98-931	Gasket, Cover Plate	1
4	96-775	Pin, Alignment (OEM 337)	1
5	95-432	Bearing, Left Side Main Shaft (OEM 8996)	1
6	95-433	Snap Ring (OEM 11161)	1
7	96-755	Bushing, Shift Shaft (OEM 33114-79)	1
8	95-434	Bearing, Left Side Counter Shaft (OEM 8977)	1
9	96-773	Stud, Case (OEM 11733)	5
10	96-777	Pin (OEM 634)	1
11		Transmission Case, See Kits Above.	1
12	96-750	Pin (OEM 609)	4
13	96-776	Pin (OEM 375)	1
14	95-791	Main Shaft Seal (OEM 12067A)	1
15	95-650	Quad Seal, O-ring (OEM 11165)	1
16	96-826	Transmission Spacer (OEM 33344-94)	1
17	94-378	Pulley, 32T, includes # 18,19	1
18	94-381	Lock Nut Kit, includes # 19 (OEM 35211-91, 40251-91, and 3594)	1
19	98-925	Screw, Button Head, 1/4-20 x 5/8" (OEM 3594)	2

GEAR TRAIN

Item Number	Part Number	Description	Quantity
1	98-941	Thrust Washer	1
2	98-919	Main Shaft, Transmission	1
3	98-911	Counter Shaft Unit and Sixth Gear, 16 teeth	1
4	96-608	Roller Bearing (OEM 8876A)	5
5	98-913	Sixth Gear, 35 teeth, Main Shaft	1
6	96-659	Thrust Washer, Main Shaft and Counter Shaft (OEM 6003)	7
7	96-621	Retaining Ring, Main Shaft and Counter Shaft (OEM 11067)	6
8	98-909	First Gear, 25 teeth, Counter Shaft	1
9	98-918	First Gear, 16 teeth, Main Shaft	1
10	96-942	Fourth Gear, 19 teeth, Counter Shaft	1
11	96-943	Fourth Gear, 29 teeth, Main Shaft	1
12	96-944	Third Gear, Main Shaft, 27 teeth	1
13	98-906	Fifth Gear, 17 teeth, Counter Shaft (OEM 35626-79A)	1
14	96-945	Second Gear, Main Shaft, 23 teeth	1
15	98-914	Main Drive/Fifth Gear, 32 teeth, Main Shaft (OEM 35029-91), includes # 16, 33	1
16	96-609	Bearing (OEM 35051-89)	2
17	98-908	Third Gear, Counter Shaft, 23 teeth	1
18	98-910	Second Gear, Counter Shaft, 27 teeth	1
19	98-920	Trap Door, Six Speed	1
20	98-921	Bearing, Trap Door	2
21	98-928	Spacer	1
22	98-922	Retainer Plate	1
23	96-683	Locknut, Main Shaft and Counter Shaft	2
24	98-925	Button Head Screw, Bearing Retainer	2
25	78-452	Gasket, Trap Door (OEM 35652-79)	1
26	96-946	Bolt, SHCS 1/4-20 x 1-1/4"	2
27	96-947	Washer (0.355" OD., 0.250" ID.)	2
28	98-931	Gasket, Speedo Hole Cover Plate	1
29	98-930	Cover Plate, Speedo Hole	1
30	98-929	Screw, SHCS 1/4-20 x 7/16"	1
31	96-948	Bolt, SHCS 5/16-18 x 1-1/2"	4
32	96-949	Washer (0.475" OD., 0.3125" ID.)	4
33	95-793	Oil Seal, Gear End (OEM 12035A)	1
34	41-167	Drain Plug, Magnetic (OEM 739A)	1
35	95-451	Inner Race (OEM 34091-85)	1
36	96-750	Slip pin	1

TORQUE VALUES

	BOLT SIZE	TORQUE	LOCTITE
TRANS. TOP BOLTS	1/4-20	9-10 FT/LBS	BLUE
CLUTCH RELEASE COVER BOLTS	1/4-20	9-10 FT/LBS	BLUE
TRAP DOOR BOLTS	5/16-18	15 FT/LBS	RED
TRAP DOOR BOLTS	1/4-20	9-10 FT/LBS	RED
SHIFT DRUM SUPPORT BOLTS	1/4-20	9-10 FT/LBS	BLUE
SHIFT ARM BOLT	5/16-18	15 FT/LBS	BLUE
PULLEY LOCK PLATE BOLTS	1/4-20	9-10 FT/LBS	RED
NEUTRAL INDICATOR		3-5 FT/LBS	—
TRANS PULLEY NUT		120 FT/LBS	RED
PAWL ADJUSTER LOCKNUT		20 FT/LBS	—
FLUID REQUIREMENTS	18-22 FL. OZ		

ASSEMBLY

Install shifter pawl assembly into transmission case. See fig 1A & 1B.

NOTE: Lightly lube shift pawl shaft before installing.

Install the Main drive gear bearings, retaining clip and countershaft needle bearings into transmission case. See fig. 2

When installing the Main drive gear bearing retaining clip, verify that it is fully seated and cannot come out.

NOTE: Lightly coat bearings with assembly lube or gear oil for easier installation.

Install Main drive gear into bearings using special tool #97-166

See fig. 3

Install trap door gasket & verify that it is on correctly.

Install 6 speed gear set making sure to align the countershaft with the needle bearing assembly. Slowly slide in gear set until the mainshaft & countershaft will not slide in any further. Lightly tapping on the trap door (while verifying that there is no gear to gear interference) with a soft blow hammer will then fully seat the shafts & trap door.

See fig. 4

Once gear set is installed use the 5/16-18x1-1/2 & 1/4-20x1-1/2 bolts to secure the trap door.

Torque the 5/16 bolts to 15 ft-lbs w/ red loctite (high strength)

Torque the 1/4 bolts to 9 ft-lbs w/ red loctite (high strength)

See fig. 5

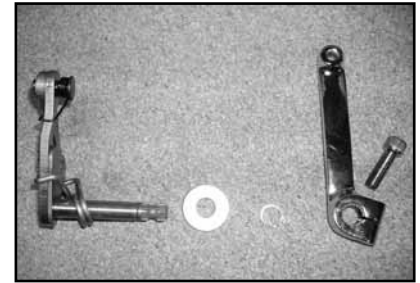


FIG. 1A

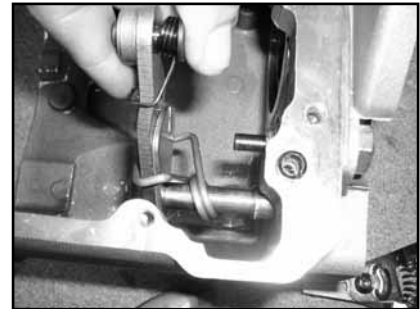


FIG. 1B

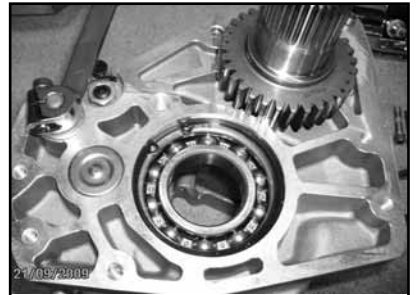


FIG. 2

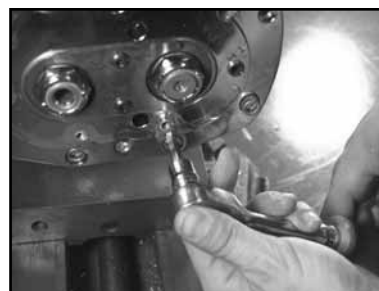


FIG. 3

FIG. 4



FIG. 5



At this time check to make sure all gears rotate freely & that all slider gears slide with no interference.

Lightly lube & install quad seal onto main drive gear.

See fig. 6

Install Main seal using special tool #97-164.

See fig. 7

Install spacer onto mainshaft.

NOTE: Beveled side goes in towards quad seal.

See fig. 8

Install shifter forks onto appropriate slider gears.

See fig. 9A & 9B

Lightly lube & install shift fork shafts.

NOTE: Short shaft is installed from the right side with the threaded hole facing out.

Long shaft is installed from the left side & should not protrude from the right side of case.

See fig. 10

Install shift fork shaft allen head plugs. (Use blue loctite to prevent movement of plug & to aid in sealing)

NOTE: Plug on right side will seat fully. To prevent distortion of shift fork shaft torque to 5 ft. lbs (Use blue loctite do not overtorque)

Thread the allen head plug on left side until just below flush with housing.

See fig. 11

At this time verify shift forks slide freely on their shafts.

Put gear set in neutral. (no gear dogs mesh/interlock)



FIG. 6

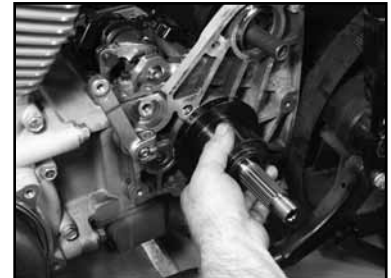


FIG. 7



FIG. 8



FIG. 9A



FIG. 9B



FIG. 10



FIG. 11

Install pillow blocks onto shift drum. (Do not lose shims)

NOTE: Lube pillow block and shift drum bearings.

See fig. 12

Install shift drum assembly onto trans. using alignment dowels as a guide.

NOTE: Care must be taken to align shifter fork dowels to shift drum guides.

Putting shifter drum in the neutral position will aid in alignment.

See fig. 13

Once shift drum assembly is fully seated on transmission case bolt down with the original 1/4-20 bolts.

Torque 1/4-20 bolts to 9 ft-lbs using blue loctite (med. Strength).

At this time lift shift detent & shifter pawl arm & verify that the shift drum has free motion & proper endplay (.004"-.012") Shim accordingly.

See fig. 14

Once proper endplay has been achieved place transmission in 3rd gear & adjust pawl assembly so that shifter arm will rotate drum completely through all gears. Typically adjusting pawl so that it is centered while it is in 3rd gear produces the smoothest shifting.

NOTE: Main shaft must be spinning to aid gear engagement.

Install top cover gasket & top cover using the 1/4-20 bolts.

Torque 1/4-20 bolts to 9 ft-lbs using blue loctite (med. strength).

Install clutch pushrod & throwout bearing. (lightly lube both)

See fig. 15

AT THIS TIME YOU WOULD INSTALL THE CLUTCH CABLE. SEE CLUTCH CABLE INSTALLATION INSTRUCTIONS ON PAGE 7.

Install clutch release cover gasket & clutch release cover using the 1/4-20 bolts.

Torque 1/4-20 bolts to 9 ft-lbs using blue loctite (med. strength).

See fig. 16

If required install the supplied bearing inner race (wet primary) onto mainshaft using special tool #97-85.

NOTE: Open belt primarys (dry primary) do not require a bearing inner race.

See fig. 17



FIG. 12

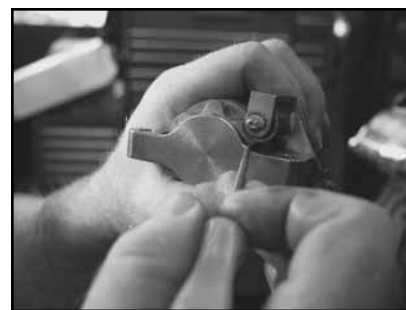


FIG. 13



FIG. 14

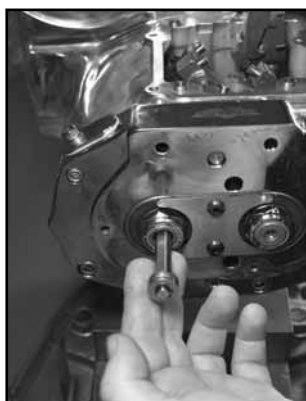


FIG. 15



FIG. 16



FIG. 17

CLUTCH CABLE INSTALLATION INSTRUCTIONS

1. Remove clutch release cover from transmission case.
See fig. 1
2. Verify that the O-ring has been installed onto the clutch cable end.
See fig. 2
3. Remove retainer clip.
See fig. 3
4. Thread the clutch cable end into the clutch release cover & tighten with a 9/16 wrench. (do not overtorque)
See fig. 4
5. Install coupler onto cable ferrule.
See fig. 5
6. Install cable & coupler onto the ramp assembly.
See fig. 6
7. Install top part of ramp assembly onto lower ball & ramp assembly. Re-install retaining clip.
See fig. 7
8. Completed clutch cable install. Ready to reinstall onto transmission case.
See fig. 8

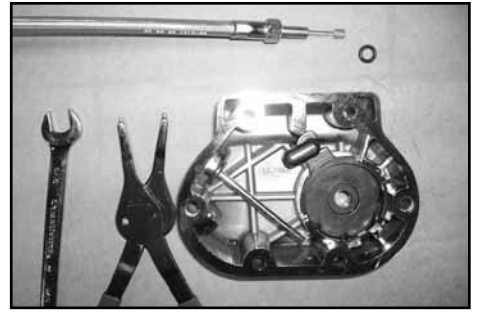


FIG. 1

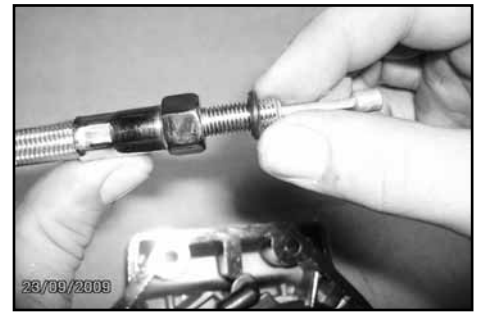


FIG. 2

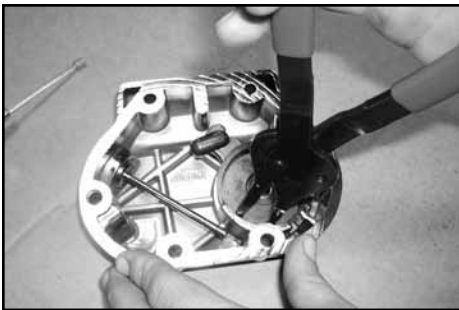


FIG. 3

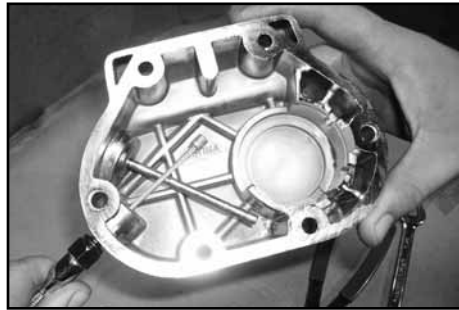


FIG. 4



FIG. 5



FIG. 6

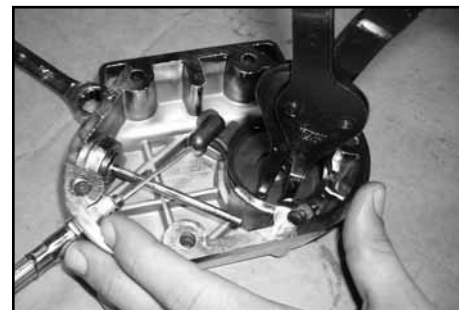


FIG. 7



FIG. 8