

## OVERVIEW

# DD6

## DIRECT DRIVE 6-SPEED™



### FEATURES

The BAKER DD6 Transmission Builder's Kit comes with all of the necessary components to convert your stock 5-Speed into a 6-Speed, providing smoother shifting, positive neutral-finding, and reduced cruising RPM on the highway. With proven technology and helical 4th, 5th, and 6th gears, your highway cruising is noise-free.

### APPLICATION AND REQUIRED HARDWARE

A Builder's Kit is, as the name implies, for building a BAKER DD6 transmission using an existing case housing and its peripheral hardware. The following 5-speed components are required to complete this installation:

- Transmission case
- Pawl and sprocket spacer seals
- Top cover and fasteners
- Clutch release cover & fasteners
- Clutch release mechanism and push rod hardware

# **BAKER DD6 INSTALLATION INSTRUCTIONS**

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## INCLUDED PARTS

### PARTS PROVIDED WITH THE BAKER DD6 BUILDERS KIT



### THE FOLLOWING PARTS ARE INCLUDED AS SHOWN IN FIGURE 1

1. Assembled DD6 gear set on BAKER bearing door.
2. Shift drum with redundant neutral pillow blocks.
3. Shifter pawl, model specific.
4. New P/N: 6209 main bearing and beveled snap ring.
5. Three shift forks, labeled #2, #3, and #4.
6. Bearing grade fork rod.
7. 28T Compensating sprocket and chain, model specific.

### OTHER PARTS INCLUDED (NOT SHOWN IN FIGURE 1)

8. High Torque Bearing Kit
9. Pulley/Sprocket Spacer
10. Neutral switch (some models).
11. Replacement chain tensioner pad and hardware (some models).
12. Eccentric adjuster screw
13. Seal 12067B

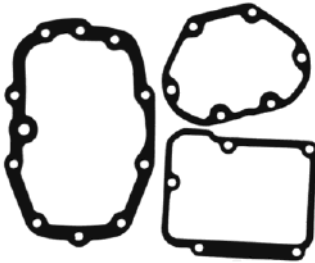
# BAKER DD6 BUILDERS KIT INCLUDED PARTS DETAIL



**DD6  
GEARSET**  
P\N: DD411  
(3.24 1ST)  
OR  
DD401  
(2.94 1ST)



**SHIFT DRUM**  
P\N:  
124E-DD6-A



**GASKET SET**  
P\N'S:  
36801-87B  
(SIDE COVER)  
  
35652-79B  
(TRAP DOOR  
COVER)  
  
34904-86E  
(TOP COVER)



**FORK ROD**  
P\N:  
122-6



**HIGH TORQUE  
BEARING W/SEAL**  
P\N: P205PP-H  
(BEARING)  
P\N 25X52X07ADL  
(SEAL)



**SHIFT FORKS**  
P\N'S:  
  
172-DD6  
  
173B-DD6  
  
174-DD6



**MAIN BEARING**  
P\N:  
6209



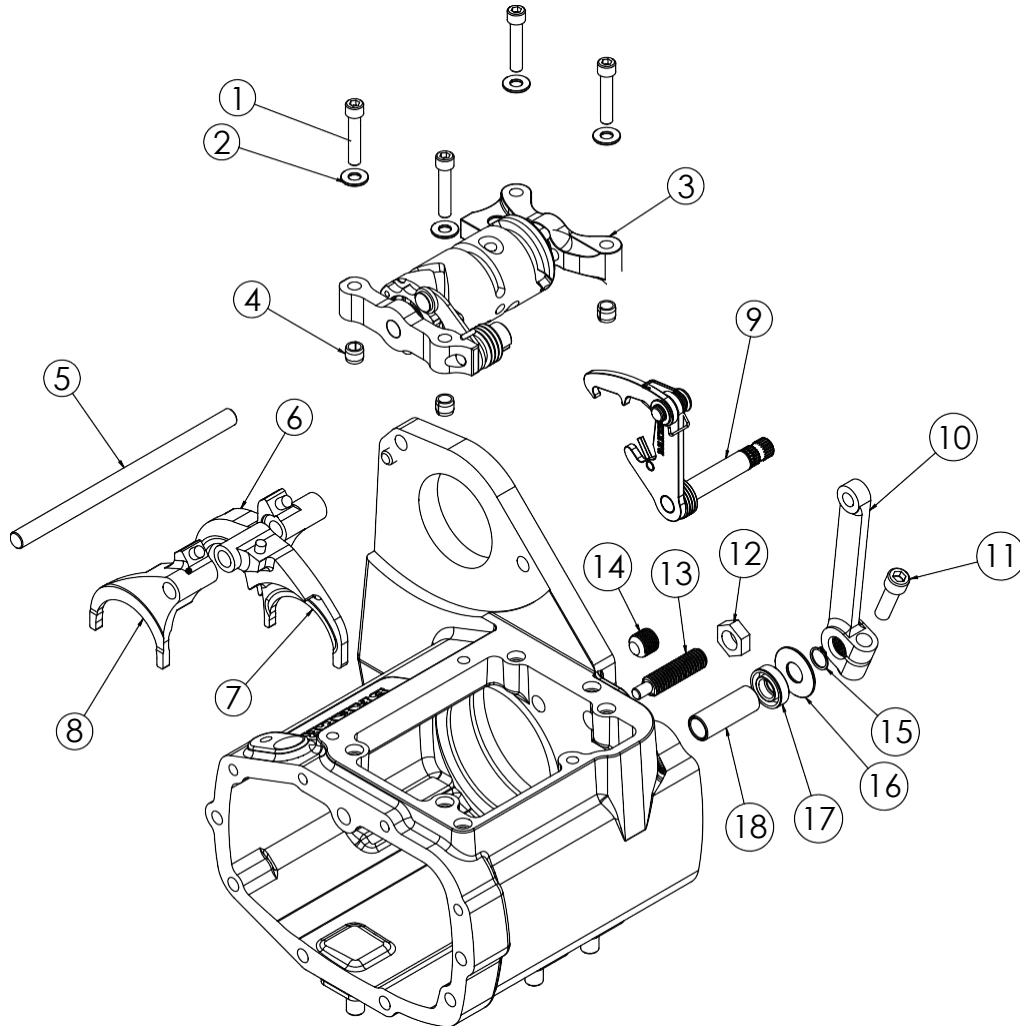
**SPROCKET**  
P\N:  
158-56



**SHIFTER PAWL**  
P\N:  
555-56C-A  
OR  
555-56LD-A

# EXPLODED VIEW DIAGRAMS

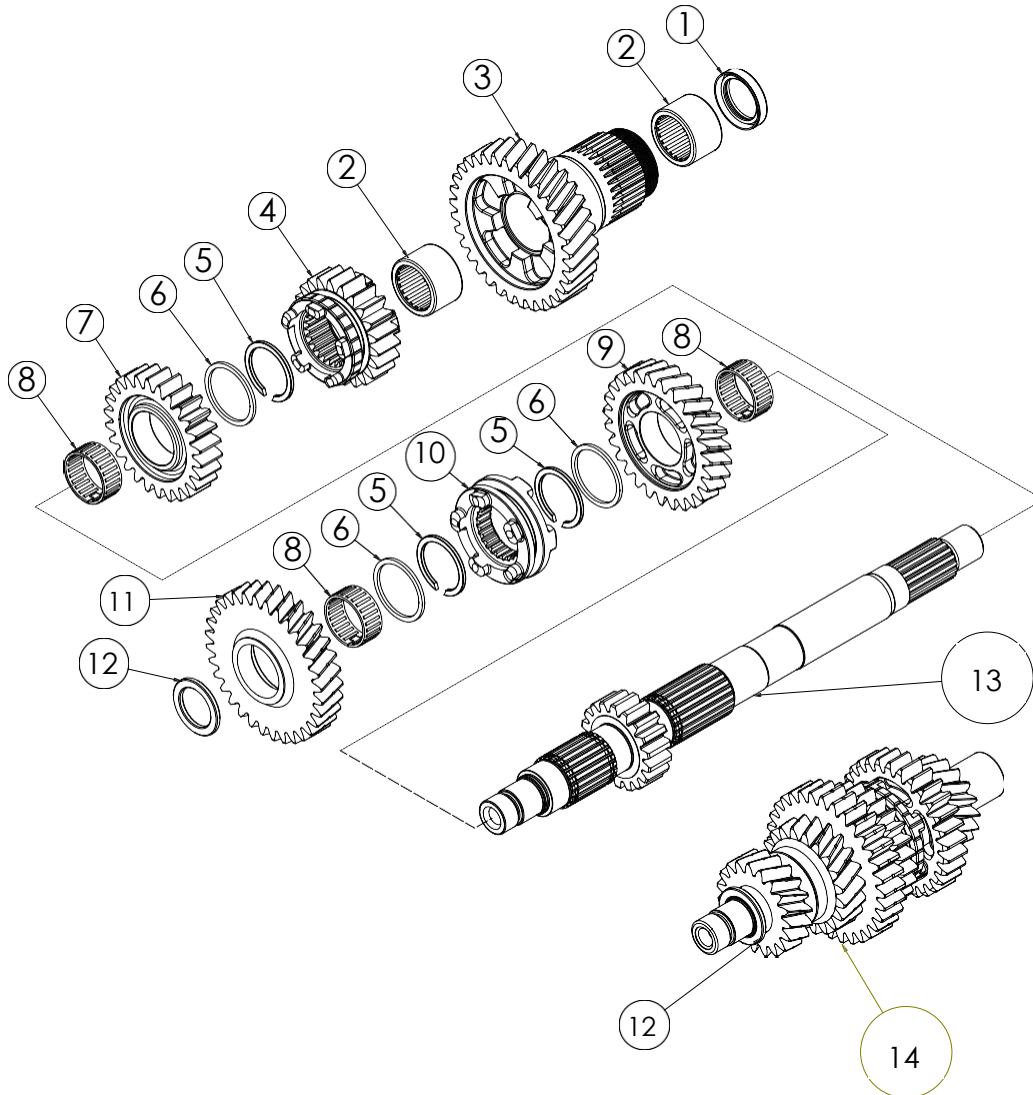
## SHIFT SYSTEM, VIEW 1



NUMBER	PART NUMBER	DESCRIPTION	QTY
1	23207	1/4-20 x 1 1/4 SHCS Bolt	4
2	33001	3/16 Washer	4
3	124E-DD6-A	Shift System	1
4	609B	Alignment Pin, 5/16 x 3/8	4
5	122-6	Fork Rod	1
6	172-DD6	Fork, 2nd MS	1
7	173B-DD6	Fork, 3rd CS	1
8	174-DD6	Fork, 4-5 MS	1
9	555-56C-A	Shifter Pawl	1
10	33715-85SA	Shift Lever, Stainless	1
11	31F100KCSS/P	5/16-24 x 1 SHCS, Polished	1
12	70813	7/16-14 Jam Nut, Stainless	1
13	152-56B	Eccentric Adjuster	1
14	25702	1/2-20 x 1/2 Set Screw	1
15	68010	7/16 Snap Ring, External	1
16	6497HW	Washer, Shifter Pawl	1
17	12045	Seal, Shifter Pawl	1
18	33114-79	Bushing, Shifter Pawl	1

# EXPLODED VIEW DIAGRAMS

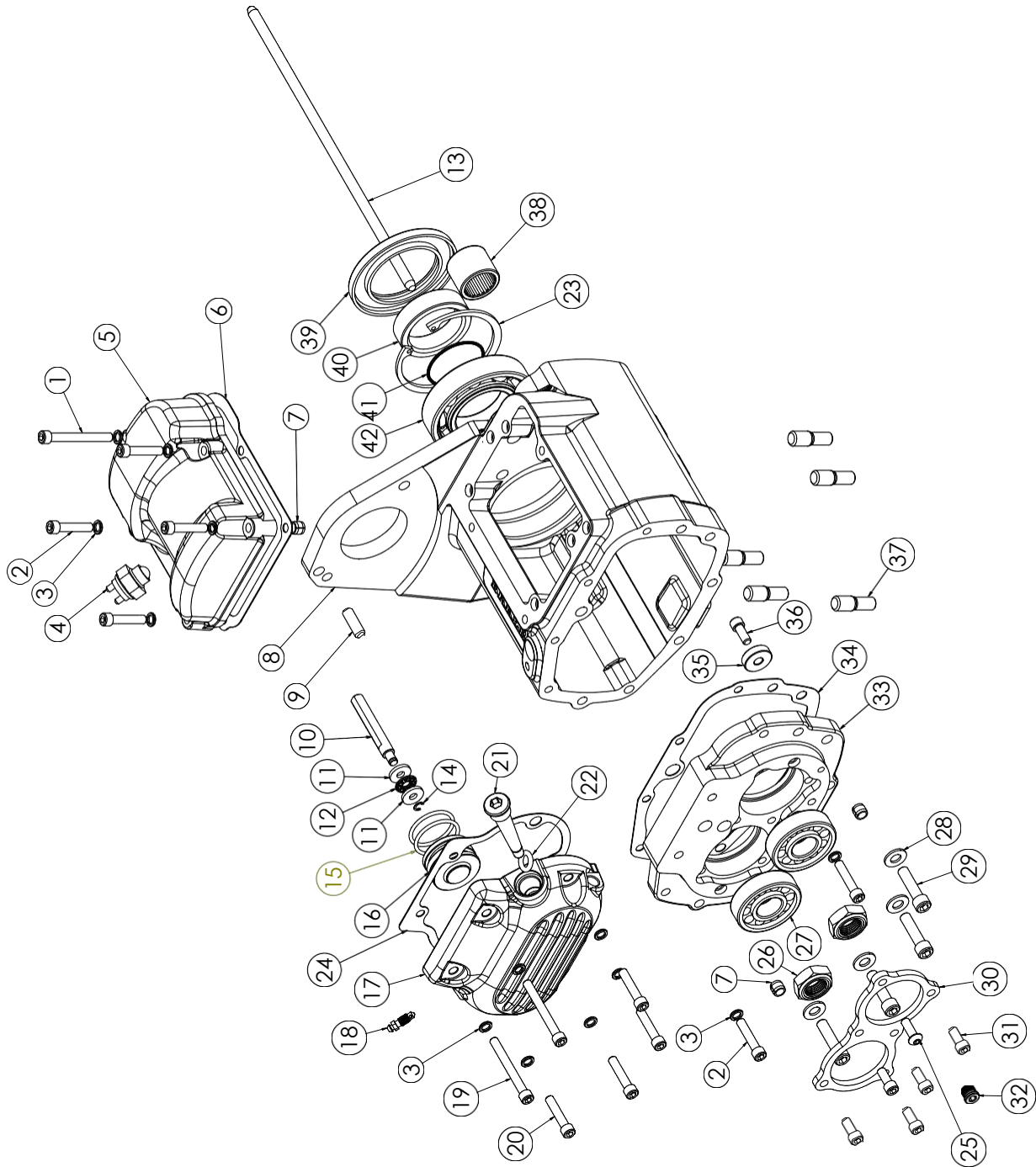
## GEARSET, VIEW 2



NUMBER	PART NUMBER	DESCRIPTION	QTY
1	12035B	Oil Seal, Main Drive Gear	1
2	HK2520	Bearing, Main Drive Gear	2
3	DD6-6M-1	Main Drive Gear, 6 <sup>th</sup> Main	1
4	DD6-2M-1	Gear, 2 <sup>nd</sup> Main	1
5	11067	Retaining Ring	5
6	6003B	Thrust Washer	5
7	DD6-3M-1	Gear, 3 <sup>rd</sup> Main	1
8	8876A	Bearing, Split Cage	5
9	DD6-4M-1	Gear, 2 <sup>nd</sup> Main	1
10	DD6-4C5-1	Dog Clutch, 4 <sup>th</sup> - 5 <sup>th</sup> Gear	1
11	DD6-5M-1	Gear, 5 <sup>th</sup> Main	1
12	TWD1423	Thrust Washer	2
13	DD6-MS	Mainshaft w/ 1 <sup>st</sup> Gear (3.24 Standard)	1
13A	DD6-MS-2.94	Mainshaft w/ 1 <sup>st</sup> Gear (2.94 Optional)	1
14	DD6-CS	Countershaft Cluster (3.24 Standard 1 <sup>st</sup> )	1
14A	DD6-CS-2.94	Countershaft Cluster (2.94 Optional 1 <sup>st</sup> )	1
15	BK2526	Countershaft Bearing (not shown)	1

# EXPLODED VIEW DIAGRAMS

## TRANSMISSION HOUSING VIEW 3



# EXPLODED VIEW DIAGRAMS

## THE FOLLOWING PARTS ARE INCLUDING AS SHOWN IN TRANSMISSION HOUSING VIEW 3

NUMBER	PART NUMBER	DESCRIPTION	QTY
1	25C225KCSS/P	1/4-20 x 2 1/4" SHCS, Polished SS	1
2	25C125KCSS/P	1/4-20 x 1 1/4" SHCS, Polished SS	6
3	6099SS	1/4" Washer, Stainless	13
4	33902-98	Switch, Neutral Indicator	1
5	34468-56A	Top Cover, LSD 91-98 ST	1
6	34904-86E	Gasket, Top Cover	1
7	609B	Alignment Dowel	4
8	214C-56CB	BAKER Transmission Housing	1
9	26770	Dowel, Starter	1
10	37089-84	Actuator Rod	1
11	TWC411	Thrust Washer, Actuator Rod	2
12	TC411	Bearing, Actuator Rod	1
13	37088-90	Clutch Rod	1
14	10705-01149	C-Clip, Actuator Rod	1
15	66853	O-ring	2
16	124-5L38	Piston, 1.375" Bore	1
17	459-6	Clutch Cover, Hydraulic, Indian, Chrome	1
18	45-9404	Bleeder Valve	1
19	25C225KCSS/P	1/4-20 x 2 1/4" SHCS, Polished SS	2
20	25C125KCSS/P	1/4-20 x 1 1/4" SHCS, Polished SS	4
21	130-56BSP	Dipstick	1
22	66825	O-ring, dipstick	1
23	1302-334PP	3 11/32" Snap Ring, Internal, Beveled	1
24	36801-87B	Gasket, Side Cover	1
25	24050	1/4-20 x 5/8" BHCS, Bearing Retainer Plate	1
26	7340BD	3/4-16 Jam Nut	2
27	6304	Bearing, Trap Door	2
28	6100	5/16" Washer, Stainless	4
29	31C125KCSS/P	5/16-18 x 1 1/4" SHCS, Polished SS	4
30	133-DD6	Bearing Retaining Plate	1
31	23202	1/4-20 x 5/8" SHCS, Bearing Retainer Plate	5
32	51740-001	3/8-24 Drain Plug	1
33	132A-DD6	Bearing Door, w/ Ear	1
34	35652-79B	Gasket, Bearing Retainer	1
35	F1409	Door Magnet	1
36	23205	1/4-20 x 1" SHCS	1
37	11733A	Stud, Rigid transmission	5
38	BK2526	Bearing, Countershaft Case	1
39	12067B	Seal, Main Drive Gear	1
40	33344-94S	Pulley Spacer	1
41	11165A	Quad seal	1
42	6209	Bearing, Main Drive Gear	1



# SKILLS, KNOWLEDGE & TOOLS

## REQUIRED READING

Regardless of the skill level or experience of the installer of the Builder's Kit, it is highly recommended that a genuine H-D Motor Company® parts catalog and Factory Service Manual be available for reference on the installation. The installation instructions for the BAKER DD6 will make reference to the Factory Service Manual. Any Factory manual from 1990 to present will be sufficient.

## SPECIAL TOOLS

The only special tools required are the same tools that would be required for any 5-speed installation. For a list of other required tools, please consult your Factory Service Manual.



TOOL A-56

For removing and installing of the main drive gear and main drive bearing, BAKER DRIVETRAIN part number TOOLA-56 is required; an equivalent tool is also available from your local Harley® dealer, part number 35316A.



TOOL B-56

For removing and installing the bearing inner race on the transmission mainshaft, BAKER DRIVETRAIN part number TOOLB-56 is necessary. Harley® also offers an equivalent tool, 34902A.



TOOL C-56

For removing and installing the 1-7/8 transmission pulley nut, BAKER DRIVETRAIN part number TOOLC-56 and TOOLD-56 will be needed. The Harley® part number is 94660-37A.



TOOL D-56

It is recommended that the Countershaft Bearing is replaced at the time of installation, using an approved tool and procedure, such as the Jims Countershaft Cup Bearing Tool. JIMS USA PN#739. (P) 805-482-6913



JIMS USA TOOL

# BAKER DD6 BUILDERS KIT ASSEMBLY

## CASE PREPARATION/ GEARSET REMOVAL

If the Builder's Kit is replacing an existing 5-speed, refer to your Factory Service Manual section 7, Mainshaft/ Countershaft removal. Follow gearset removal procedure.

Next, refer to section 7, Main Drive Gear removal, and follow removal procedure. Be sure to clean the case with Brake Cleaner or another suitable cleaner before continuing with installation.

If the Builder's Kit is going into a new case, no preparation is needed.

## CASE CLEARANCE CHECKS

The BAKER DD6 hardware is designed to fit in stock H-D® transmission cases without modification to the case or the six-speed components. Since most aftermarket cases are styled after the H-D® equivalent, the hardware will fit into aftermarket cases as well. This applies in most situations, but there are exceptions. The internal walls of the cases 'float around' occasionally in H-D® and aftermarket castings, this is not an indication of poor quality, but rather, is inherent of the casting process. Be sure to check for any potential interference before final installation of the gearset. Any necessary case modification can be done with a die-grinder.

## GEARSET INSTALLATION

Special note: 2000 - 06 88B Softail transmissions have a noted shortcoming with the landing that supports the P/N: 6209 bearing. This landing comes from the factory with a very thin wall thickness and cracks in the corner between the landing and the P/N: 6209 bearing bore. Inspect carefully for this situation.

1. Install the new main drive gear bearing provided, O.E. P/N: 6209, NEVER install the bearing into the case by applying pressure to the inner race of the bearing - you will destroy the bearing and it may fail. Install the new retaining ring with the bevel facing out.

2. Remove the main drive gear from the BAKER DD6 gearset/trap door assembly by simply sliding it off the mainshaft. To install the main drive gear into the transmission case use BAKER DRIVETRAIN part number TOOLA-56 and follow the directions as described in the Factory Service Manual.

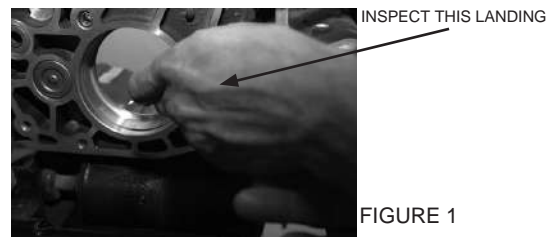


FIGURE 1

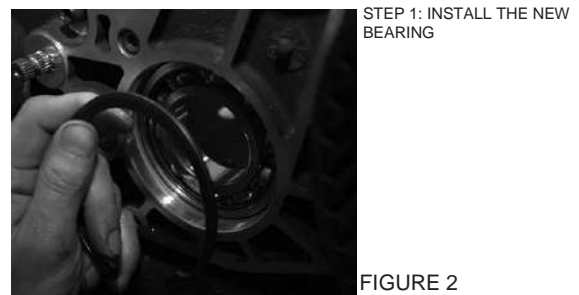


FIGURE 2



FIGURE 3

## BAKER DD6 BUILDERS KIT ASSEMBLY

All models require the changing of the eccentric adjustment screw for proper shift pawl adjustment. 2000-06 Softails and all '01 - '06 FLT and '05 Dyna models will require this change. The adjustment screw and locking nut are provided in the Builder's Kit.

3. At this time it is necessary to install the provided shifter pawl. The pawl included with the Builder's Kit is essential to the proper operation of the shift mechanism. It was specifically designed to improve fork shifting and operate in conjunction with the new shift drum to provide ease and smoothness of shifting. It will be necessary to replace the 7/16" external snap ring and washer that retains the pawl with the ones provided at this time.

4. Hang the door gasket provided onto the case dowel pins and carefully push it down to seat it against the gasket surface.

5. Apply some WD-40 or equivalent lubricant to the main drive gear seal and to the mainshaft (on the portion adjacent to the splines). Install the gearset by sliding the mainshaft through the main drive gear and slowly pushing the gearset assembly until the case dowel pins contact the dowel holes in the side door. Be sure that the threads in the end of the mainshaft do not contact the seal in the main drive gear. If the shaft tears the seal, leakage will occur. A rubber hammer is helpful to tap the bearing door gently. **WARNING: IMPACTING THE ENDS OF THE TRANSMISSION SHAFTS WILL CAUSE THE DOOR BEARINGS TO FAIL.**

6. Install the four 5/16-18 x 1-1/4 SHCS (socket head cap screws) along with the washers in the lower four holes in the bearing door. Use a small amount of Blue thread locker on the end of the threads and torque the bolts to 13-16 ft. lbs.(156-192 in.lbs.) Install the two 1/4-20 x 1 1/14 with washers in the same manner above the dowel pin holes and torque them to 7-9 ft. lbs (84-108 in. lbs).



STEP 3:  
INSTALLING  
THE SHIFTER  
PAWL AND  
SNAP RING.

FIGURE 4



STEP 4.  
HANGING THE  
DOOR GASKET.

FIGURE 5

STEP 5: INSTALLING THE GEARSET.

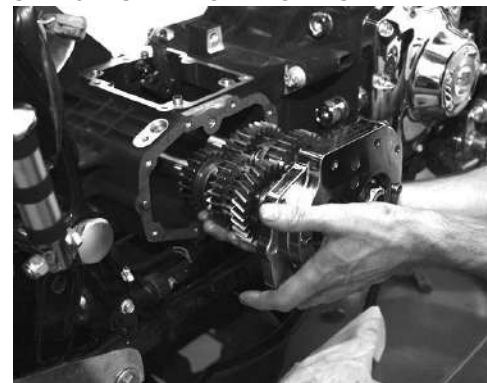


FIGURE 6



STEP 6:  
INSTALLING  
THE FOUR  
SHCS .

FIGURE 7

# BAKER DD6 BUILDERS KIT ASSEMBLY

## SHIFT FORK INSTALLATION

Figure 8 shows the proper placement of the shift forks. Fork number 4 is placed on the shift clutch between the 4th and 5th gears on the mainshaft. It will be necessary to engage the 4th gear on the mainshaft with the shift clutch. This will make installing the number 4 fork easier. Fork number 3 is placed on the 3rd countershaft gear. Fork number 2 is placed on the 2nd mainshaft gear. To simplify installation, slide the 2nd mainshaft gear into the 3rd gear on the mainshaft. This provides adequate room to slide the fork into the fork groove. Install the primary fork rod as you would in a stock 5-speed transmission through the holes in the forks. Once assembled, the shift system should appear as shown in Figure 8.

PROPER SHIFT  
FORK ALIGNMENT.

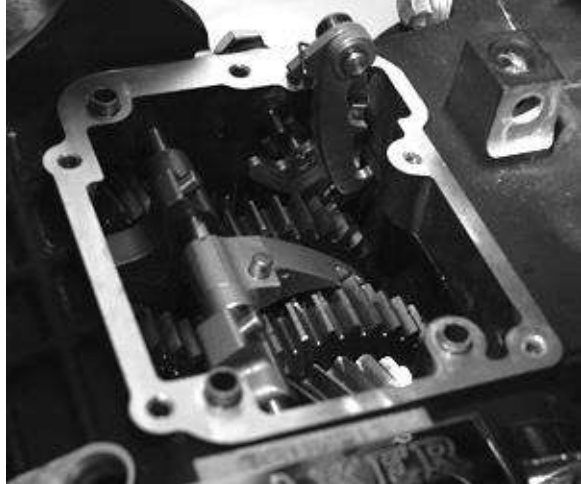


FIGURE 8

## FUNCTION CHECK

The three forks should operate smoothly along the bearing grade fork rod once installed. If binding occurs, check for proper placement and/or obstructions inhibiting the ease of fork movement. At this time, apply a generous amount of WD-40 or transmission oil to the forks and fork rod.

## SHIFT DRUM/DETENT SYSTEM

The shift drum and pillow block system of the BAKER DD6 transmission was designed with low friction and ease of operation in mind. Inside the shift drum is a ball bearing that reduces friction. No shimming or setup is required with the shift drum and pillow block system. The right side pillow block has another provision known as “redundant neutral detent”. The “redundant neutral” feature of the drum aids in finding neutral with less effort.

Install the shift drum assembly as detailed in Figure 10 making sure that the fork pins are properly riding in the drum. Install the provide 1/4-20 x 1/1/4 SHCS along with washers as you would with a stock drum. Put a small amount of Blue threadlocker on the ends of the bolts and torque them down in a circular patten 7-9 ft. lbs. (84-108 in. lbs.).

SHIFT DRUM



FIGURE 9

# BAKER DD6 BUILDERS KIT ASSEMBLY

## SHIFTER PAWL ADJUSTMENT

All models shifter pawl is adjusted in 3rd gear. All kit's will include a replacement eccentric screw and jam nut for pawl adjustment. The eccentric screw must be timed to the shifter pawl so they move on the same axes. The directions will be described as looking at the bike from the left side. When you turn the eccentric screw clockwise the shifter arm should transverse to the rear of the bike. When you turn the screw counterclockwise the arm should move to the front of the bike. If this is incorrect the eccentric is off 180 degrees, turn the eccentric ½ turn clockwise. Now that the eccentric screw and shifter pawl are timed correctly, put the transmission in 3rd gear.

With the transmission in 3rd gear adjust the pawl to have equal free play (do not force against return springs) front to back on the dowel pins. Tighten jam nut, now double check shifter pawl adjustment, as seen in Figure 11.

Reassemble the remaining components of the transmission as you would any stock 5-speed as detailed in the Factory Service Manual.

## NEUTRAL SWITCH

Depending on the year of the motorcycle, it may be necessary to replace the neutral switch. All '00 - '06 Softtail models along with the '01 - '06 FLT and '05 FXD models , with a black body switch, require installation of the neutral switch, silver body, provided for proper neutral light function.

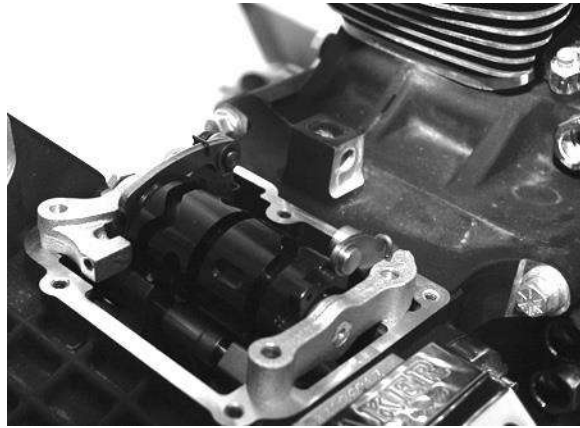


FIGURE 10

PROPER SHIFTER PAWL ADJUSTMENT IN 3RD GEAR

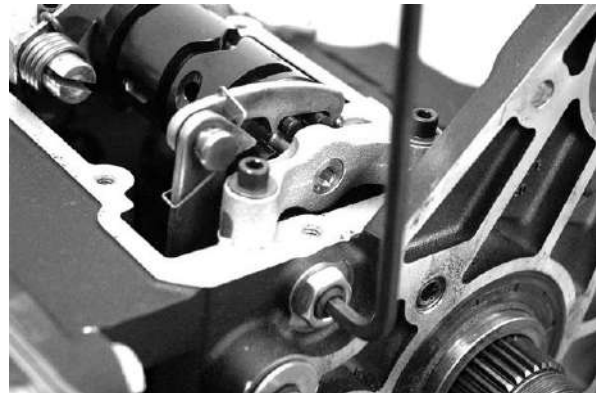


FIGURE 11

REPLACING THE NEUTRAL SWITCH



FIGURE 12

# BAKER DD6 BUILDERS KIT ASSEMBLY

## PRIMARY CHAIN AND SPROCKET INSTALLATION

Provided as part of the DD6 Builder's Kit is a 28 tooth compensating sprocket, primary chain, and tensioner with hardware (with some kits), to be assembled as shown in Figure 13.

Figure 14 displays the parts included in the kit, as follows:

1. P/N: DD6-177 Adjuster Retaining Nut
2. P/N: 24091 3/8-16 - 7/8 Allen Cap Screw
3. P/N: DD6-178 Chain Adjuster Shoe
4. P/N: 39990-01 Chain Tensioner

Some bikes are equipped with the late style chain tensioner, and only require a thicker shoe (P/N: DD6-178). Other bikes will require the late model Chain Tensioner (P/N: 39990-01) as well as using the altered bolt and nut that we include in the kit (See Figure 14 and Figure 17).

On Some models you will have to clearance the 2 pedestals on the inner primary that the chain inspection cover bolts to. In those application situations you will have to heli-coil the outer primary cover for the two bolts that you cleared.

For most older applications you will be able to flip the entire tensioner (Figure 16) upside down (Figure 2) and that will accomplish the difference required. We do not recommend using "auto tensioners" from any manufacturer with our DD6 Builders Kit.

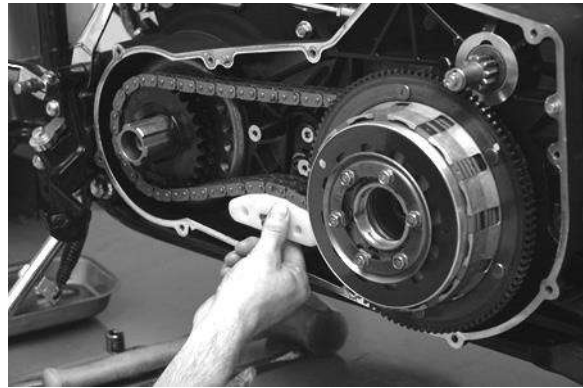


FIGURE 13

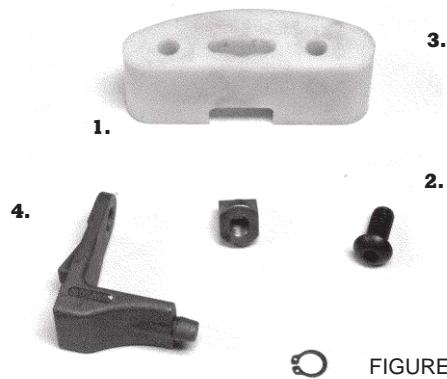


FIGURE 14

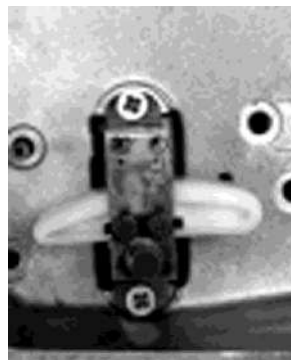


FIGURE 15



FIGURE 16

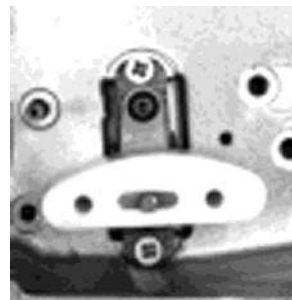


FIGURE 17

# BAKER DD6 BUILDERS KIT ASSEMBLY

## SPEED SENSOR INSTALLATION

Provided in the kit is a speed sensor spacer. Remove the speedometer sensor from the transmission case and place the spacer plate (paper gasket) under the stock sensor. This is important to maintain proper spacing to the 5th gear on the mainshaft. The gasket is only .060 thick, so be careful not to over-torque it. You may require a speed sensor signal conversion box to correctly re-calibrate the speedo head. This unit and is available from BAKER DRIVETRAIN, part number 95E-56.



BAKER SPEED SENSOR SIGNAL CONVERSION BOX. PART NUMBER 95E-56.

## FLUID FILL

Fluid capacity is 20-24 fluid oz. of oil.

BAKER recommends using Spectro Heavy Duty 6 Speed Gear Lube, however any of the following oils can be used:

- Spectro - 75W 140SPL
- Bel Ray - 80W 90
- Torco - 85W 140
- AMSOIL - 75W 90



BAKER DRIVETRAIN RECOMMENDS USING SPECTRO HEAVY DUTY 6 SPEED GEAR LUBE.

# TERMS & CONDITIONS

## SPECIAL ORDERS

A minimum \$500 deposit is required with all special orders. Special orders include unique case finishes, unique side door requests (i.e.; wrinkle black door or no logo).

## ALL OTHER ORDERS

Orders can be pre-paid using VISA, Mastercard or American Express.

Prices shown are F.O.B. Haslett, MI. BAKER™ provides free UPS ground shipping on all retail orders for complete transmissions or transmission kit. UPS air shipment is available upon request. Customer is responsible for air shipment premiums.

## LIMITED WARRANTY

BAKER™ Inc. transmission assemblies, transmission kits, and wide tire kits are guaranteed to the original purchaser to be free of manufacturing defects in materials and workmanship for a period of 5 years from the date of purchase or up to 50,000 miles - whichever is sooner.

If the product is found by BAKER™ to be defective, such products will, at the option of BAKER™, be replaced or repaired at cost to BAKER™.

In the event warranty service is required, the original purchaser must call or write BAKER™ immediately with the problem.

If it is deemed necessary for BAKER™ to make an evaluation to determine whether the transmission assembly or transmission kit is defective, the entire transmission assembly, whether originally purchased as an assembly or kit, must be properly packaged and returned prepaid to BAKER™ with a copy of the original invoice of purchase.

If after an evaluation has been made by BAKER™ and a defect in materials and/or workmanship is found, BAKER™ will, at BAKER's option, repair or replace the defective part of the assembly.

Warranty card must be returned within 45 days of purchase to be valid.

## ADDITIONAL WARRANTY PROVISIONS

This limited warranty does not cover labor or other costs or expenses incidental to the repair and or replacement of BAKER™ products. This warranty does not apply if one or more of the following situations is judged by BAKER™ to be relevant: improper installation, accident, modification (including but not limited to use of unauthorized parts), racing, high performance application, mishandling, misapplication, neglect (including but not limited to improper maintenance), or improper repair.

BAKER™ shall not be liable for any consequential or incidental damages arising out of or in connection with a BAKER™ transmission assembly, transmission kit, swingarm, fender, component or part. Consequential damages shall include without limitation, loss of use, income or profit, or losses sustained as the result of injury (including death) to any person or loss of or damage to property.

BAKER™ transmissions, transmission kits, and Wide Tire Kits are designed exclusively for use in Harley-Davidson® motorcycles. BAKER™ shall have no warranty or liability obligation if a BAKER™ part is used in any other application.

If it is determined that a BAKER™ transmission assembly has been disassembled during the warranty period for any reason, this limited warranty will no longer apply.



## **DISCLAIMER**

The words Harley, and H-D are registered trademarks and are for reference only. Use of H-D model designations and part numbers are for reference only. BAKER Drivetrain has no association with, and makes no claim against, these words, trademarks, or companies.

It is the sole responsibility of the user to determine the suitability of this product for his or her use, and the user shall assume all legal, personal injury risk and liability and all other as well as all other obligations, duties and risks associated therewith.