

Fig. 160

Set the auxiliary pump "A" gear in the front cover.

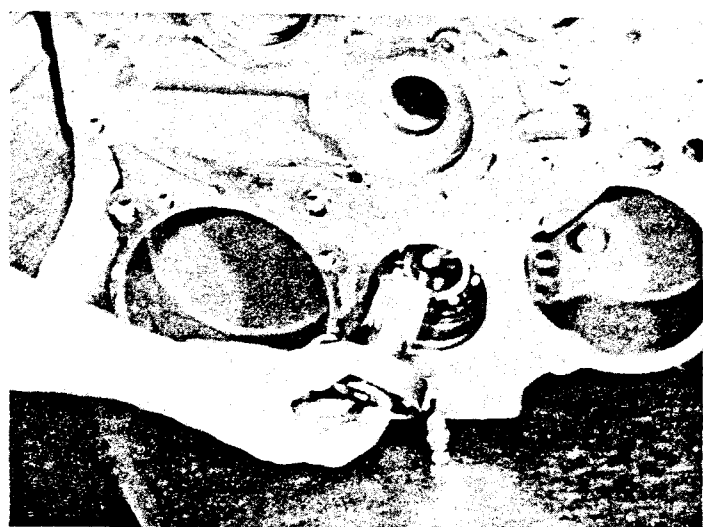


Fig. 161

Press the other auxiliary pump bearing on the auxiliary pump shaft. Turn the front cover around and install the auxiliary pump shaft.

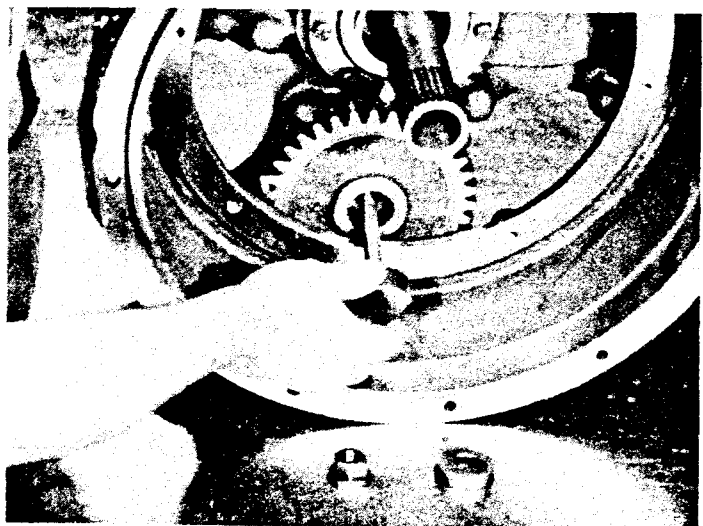


Fig. 162

Use a 3/8" all thread bolt 6" long with one thick 3/8" flat washer, and a bushing that will fit over the auxiliary pump gear hub.

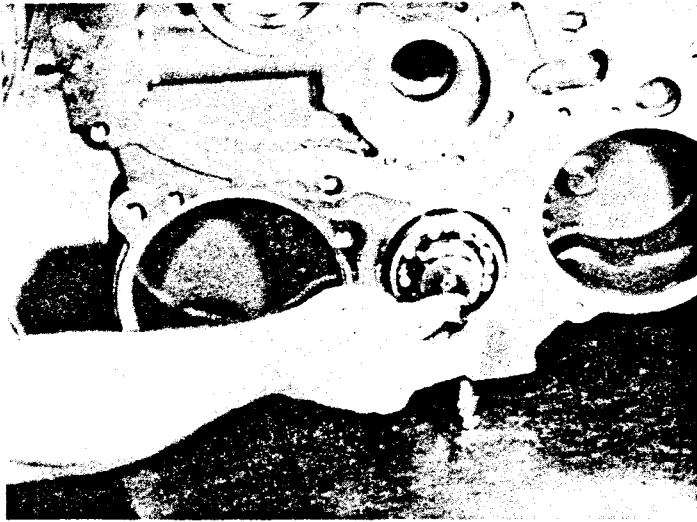


Fig. 163

While pulling the auxiliary pump shaft bearing and auxiliary pump gear, caution should be used as not to damage any of the parts.

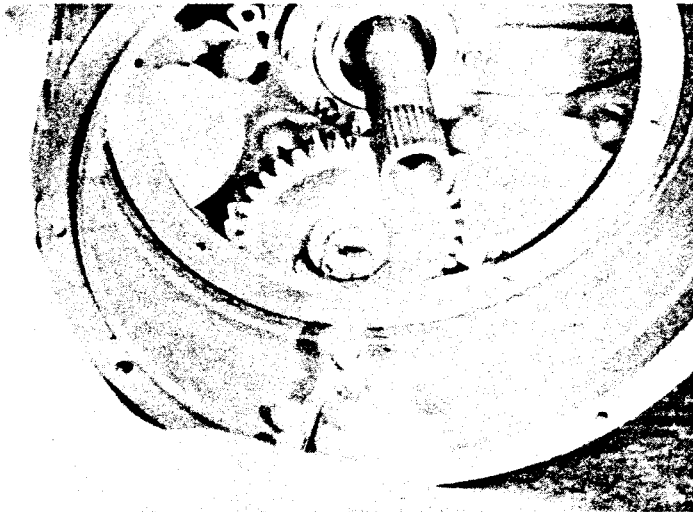


Fig. 164

After the auxiliary pump gear has been installed on the auxiliary pump shaft, install the snap ring on the auxiliary pump shaft.

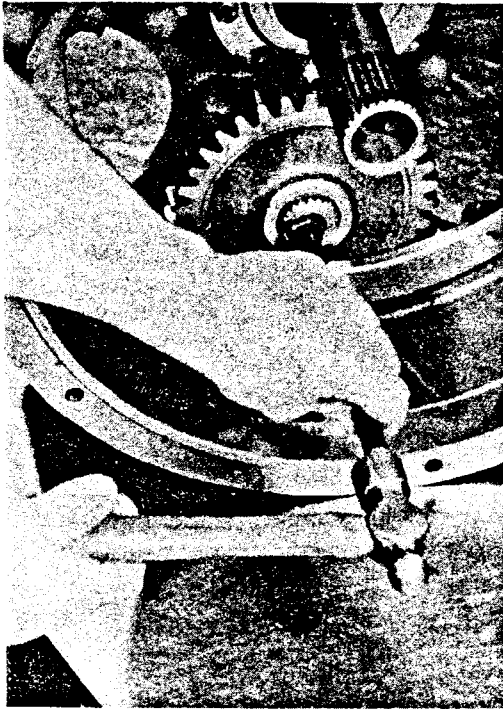


Fig. 165

Use a brass drift and seat the snap ring by driving the auxiliary pump shaft back against the snap ring. Use caution not to drive it too far and damage the snap ring.

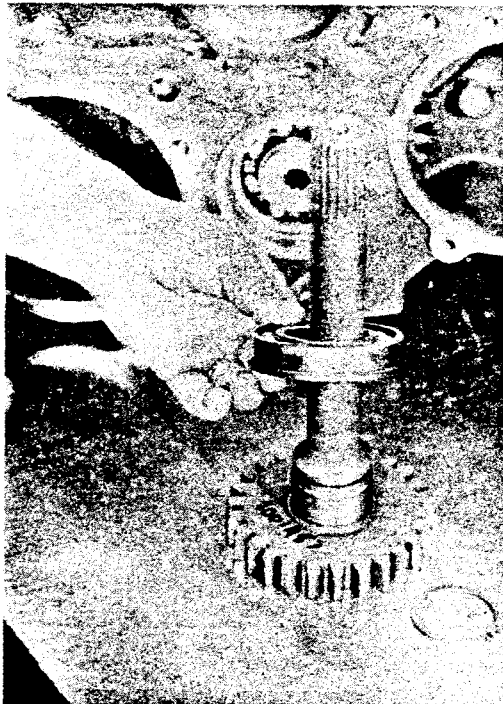


Fig. 166

Press the bearing on the input shaft with the snap ring groove next to the gear.

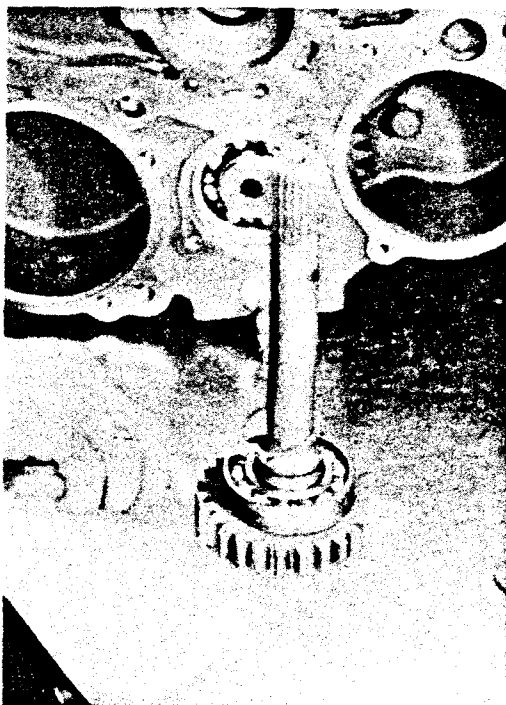


Fig. 167

Install the input shaft bearing retainer snap ring.

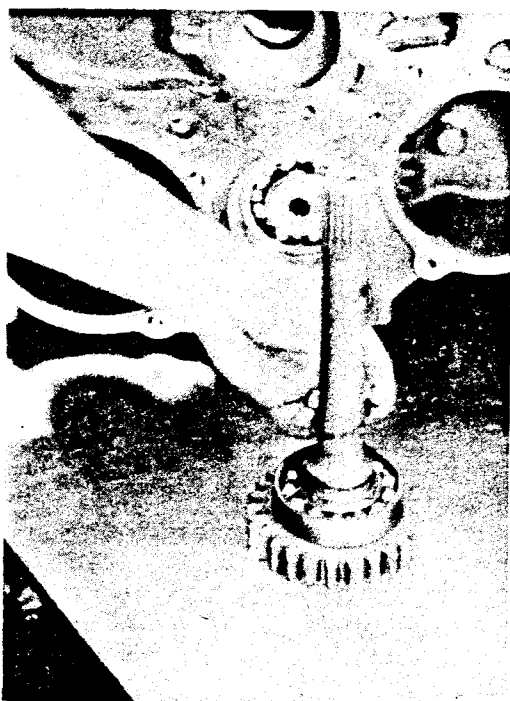


Fig. 168

Install the seal ring on the input shaft.

NOTE: Use caution when installing the seal ring not to break it.

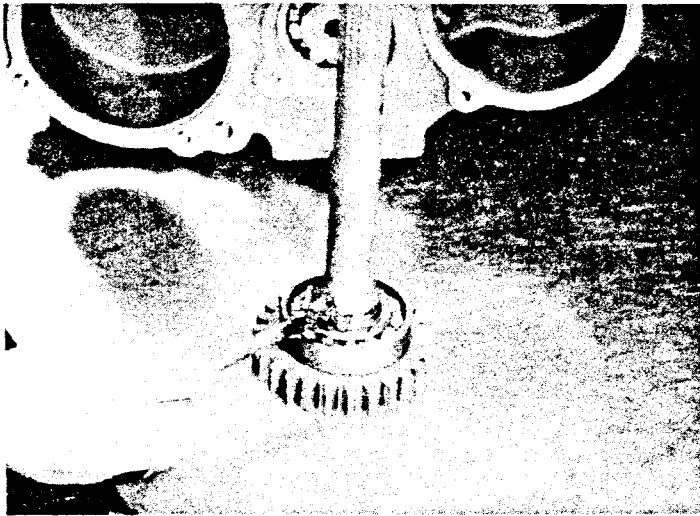


Fig. 169

Apply a coat of a 'good grade of greae on the seal ring and center it on the shaft. The grease will aid in keeping it centered on the shaft during installation.

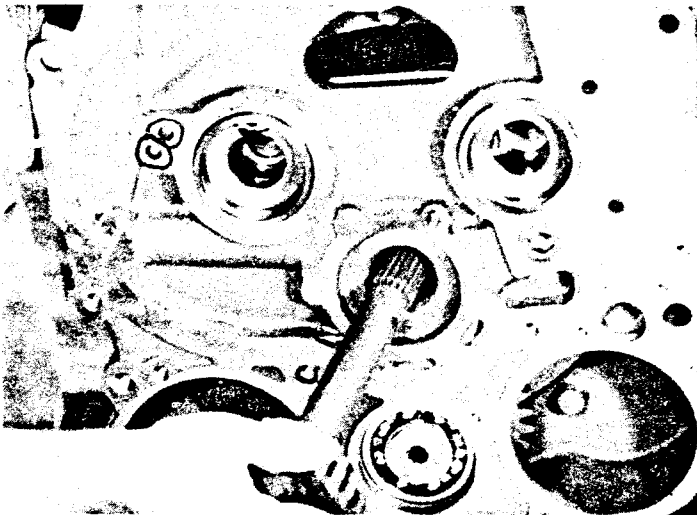


Fig. 170

Install the input shaft in the front cover. Be careful no to damage the seal ring during installation.

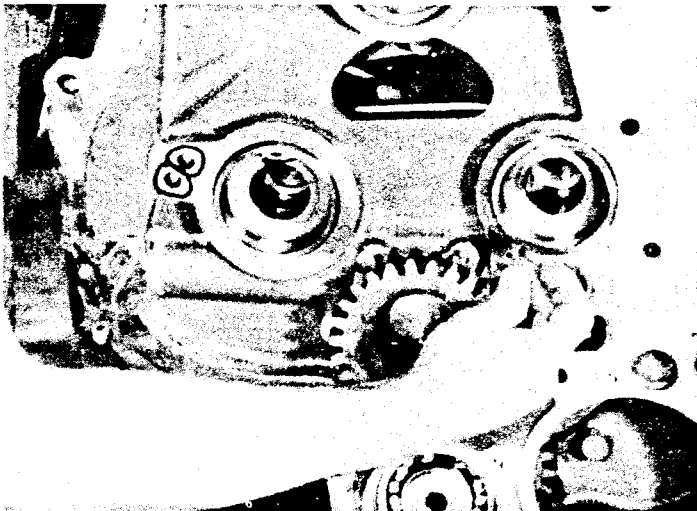


Fig. 171

Install the bearing retainer clips using the two 5/16-18X2 1/4 " capscrews. The clips will install into the groove on the input bearing, with the flat side toward the housing.



Fig. 172

Install the auxiliary cover plate with the gasket and torque the capscrews to 30 ft. lbs.

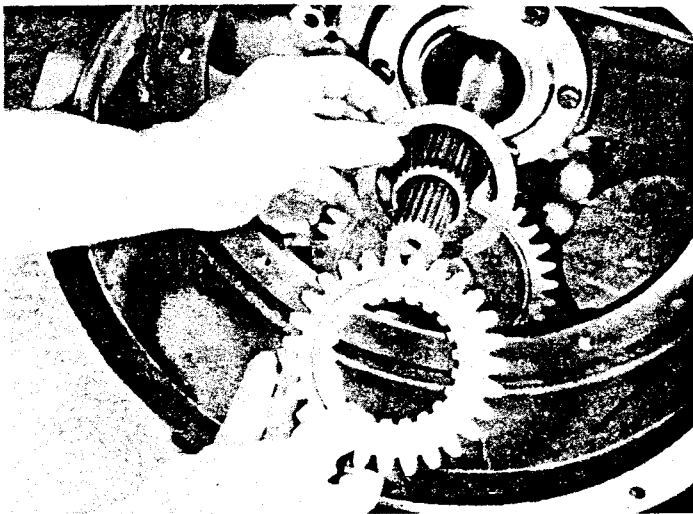


Fig. 173

Turn the front cover around and install the pump thrust washers with a thin coat of oil and install the impeller hub gear.



Fig. 174

Apply a thin coat of permatex gasket sealer on the seal area of bearing retainer.



Fig. 175

Install the oil seal with the seal lip facing down or toward the transmission. Use a good type pf seal driver to prevent damage to the seal during installation.



Fig. 176

Turn the bearing retainer over and install the bearing snap ring.

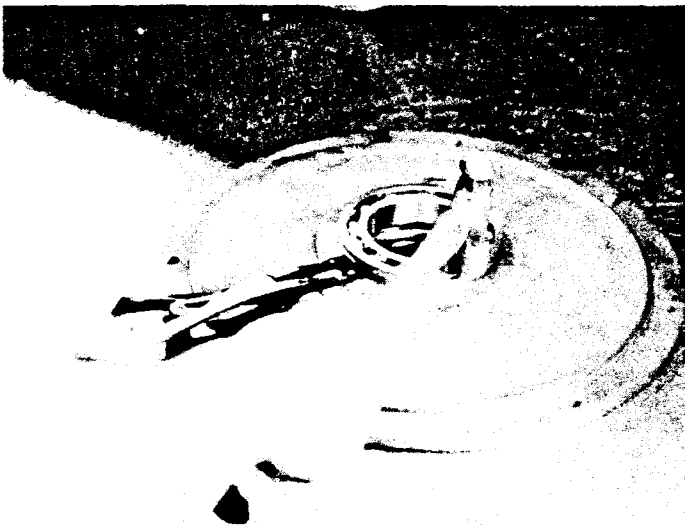


Fig. 177

Using a pair of duck bill type snap ring pliers, spread the snap ring and start the bearing into the retainer using a small hammer to lightly tap the bearing, starting it into the snap ring.

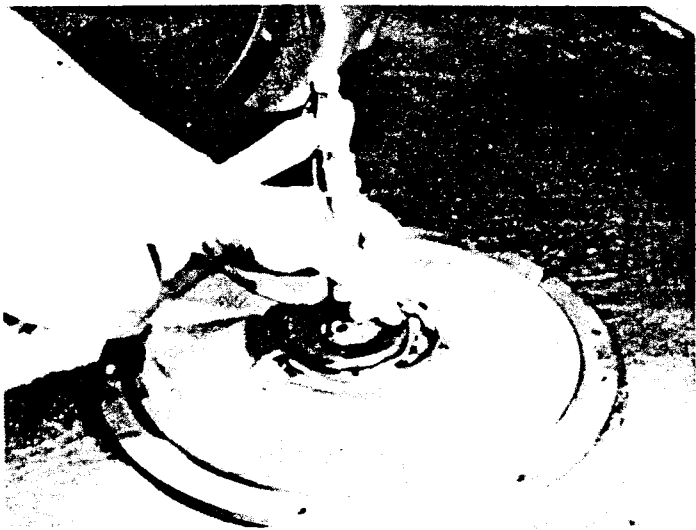


Fig. 178

Using a good type of bearing driver, drive the bearing into the retainer until it seats into the snap ring.



Fig. 179

Install two 3/8-16 guide pins into the front cover.



Fig. 180

Install the bearing retainer gasket on the 3/8-16 guide pins.



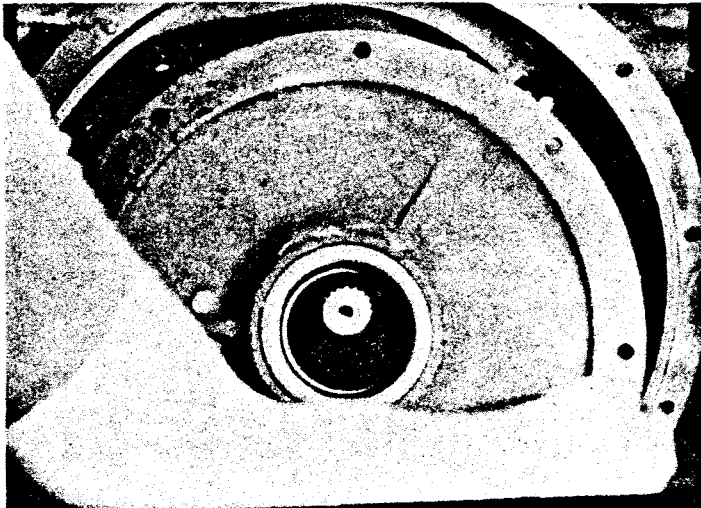


Fig. 181

Install the bearing retainer onto the guide pins. Insert the 3/8-16 capscrews. Remove the guide pins.

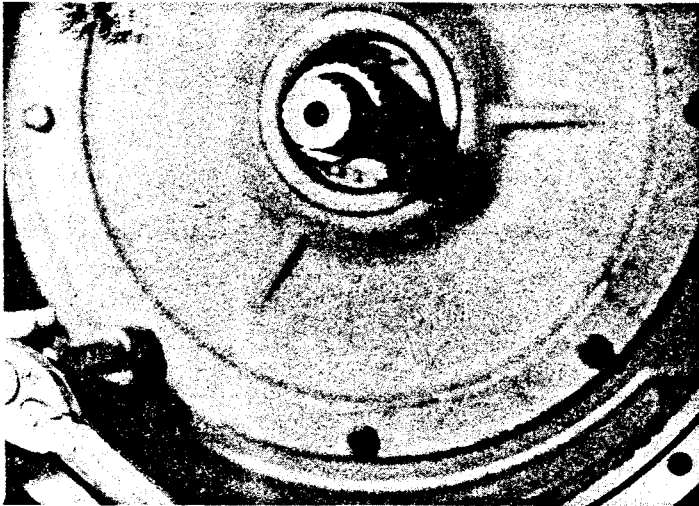


Fig. 182

Torque the 3/8-16 capscrews to 30 ft. lbs. using a criss-cross pattern.

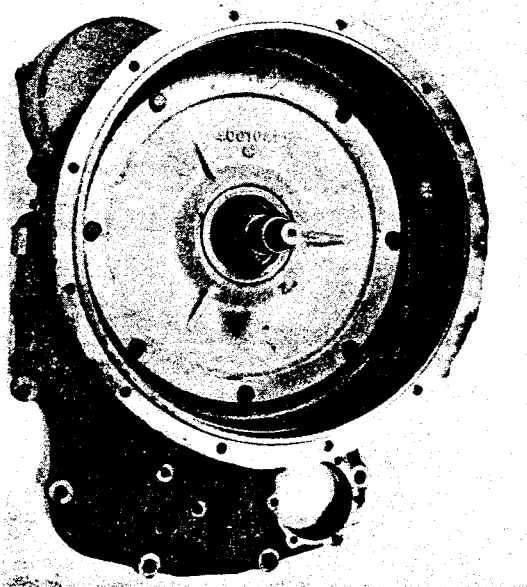


Fig. 183

This is the completed front cover assembly.

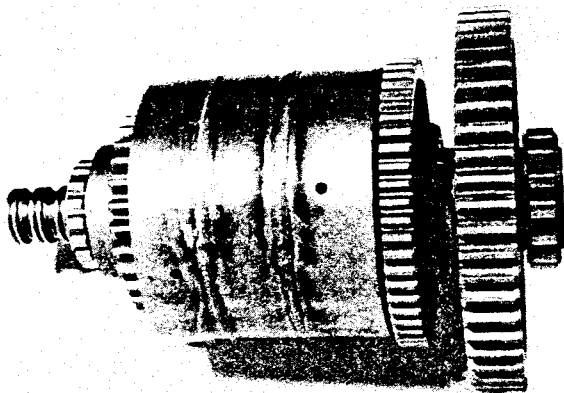


Fig. 184

The assembly for the clutch stack will be from figure 185 thru figure 229.

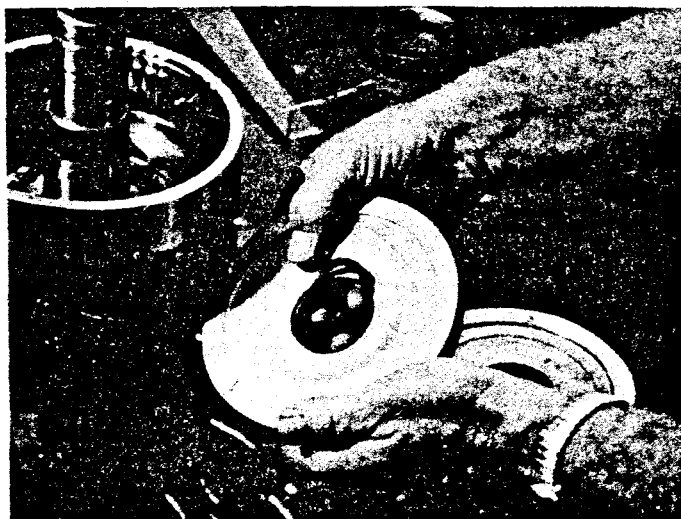


Fig. 185

Install the piston "O"ring into the piston.

NOTE: This is the thick piston

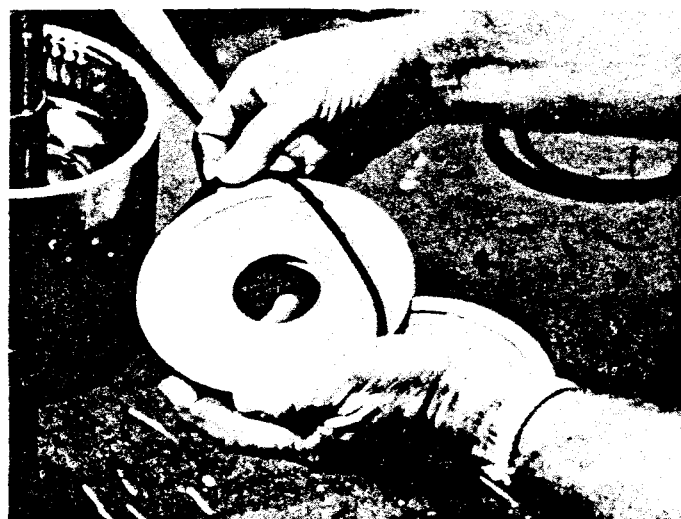


Fig. 186

Install the seal ring onto the piston.



Fig. 187

Apply clean automatic transmission fluid to the input shaft.



Fig. 188

Apply clean automatic transmission fluid to the seal ring on the piston.

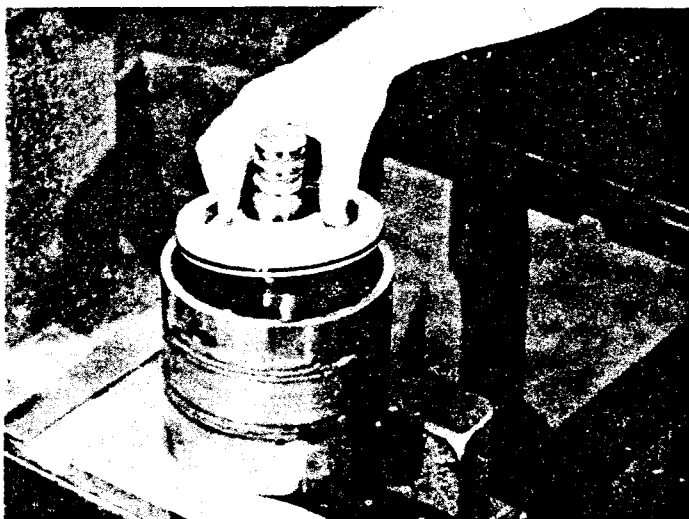


Fig. 189

Install the piston as shown.

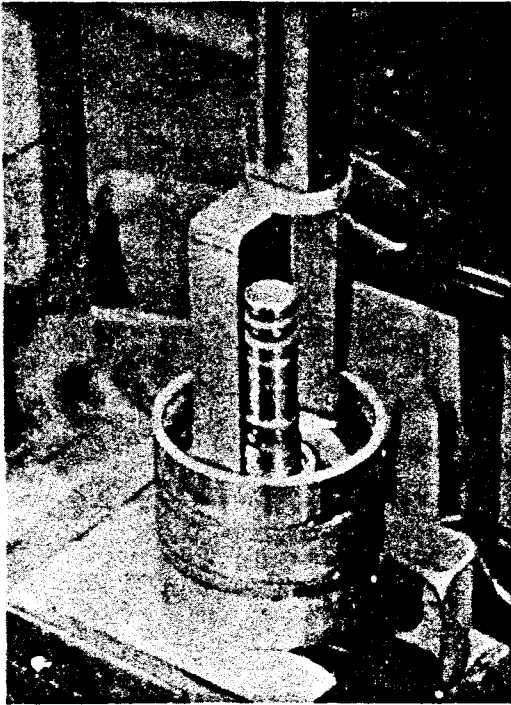


Fig. 190

Press the piston into the welded clutch assembly, using the special tool.

CAUTION: Be careful during installation of the piston. Never use a hammer to install the piston. A broken seal can be the result.

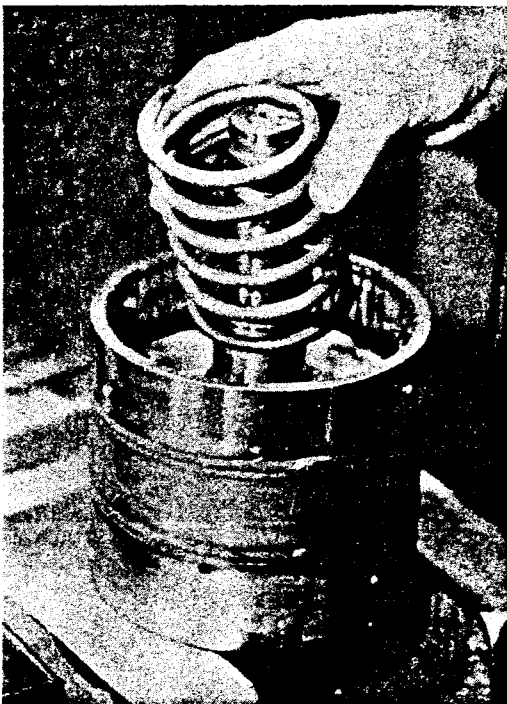


Fig. 191

Install the clutch spring as shown.

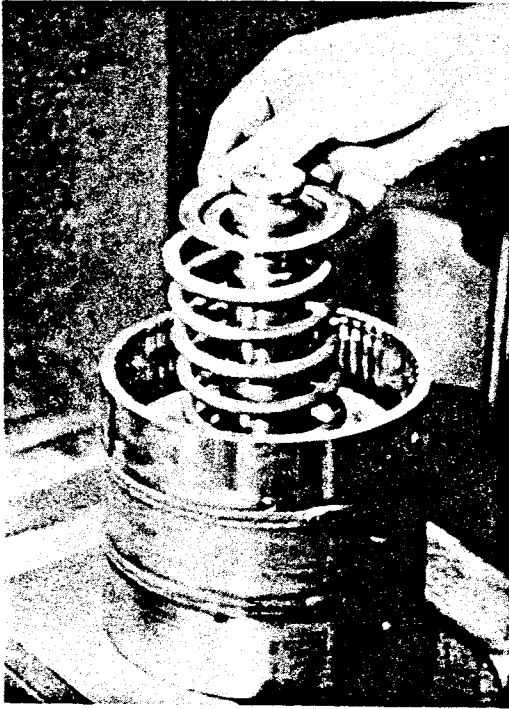


Fig. 192

Install the clutch spring retainer as shown.

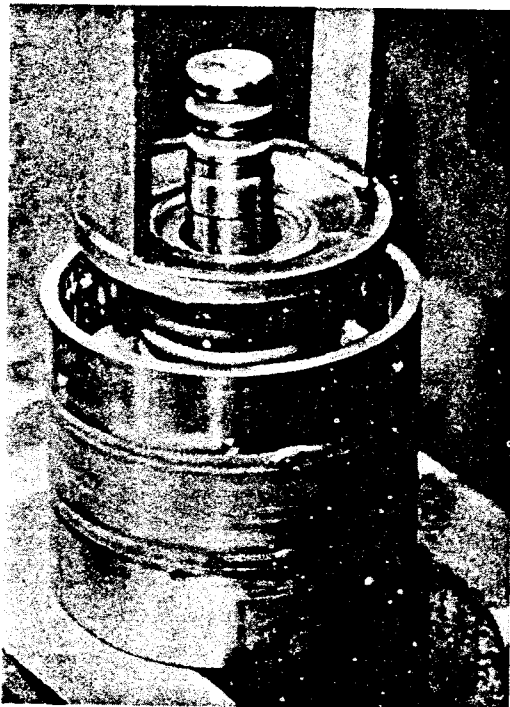


Fig. 193

Use a hand press and the special pressing tool to depress the clutch spring.

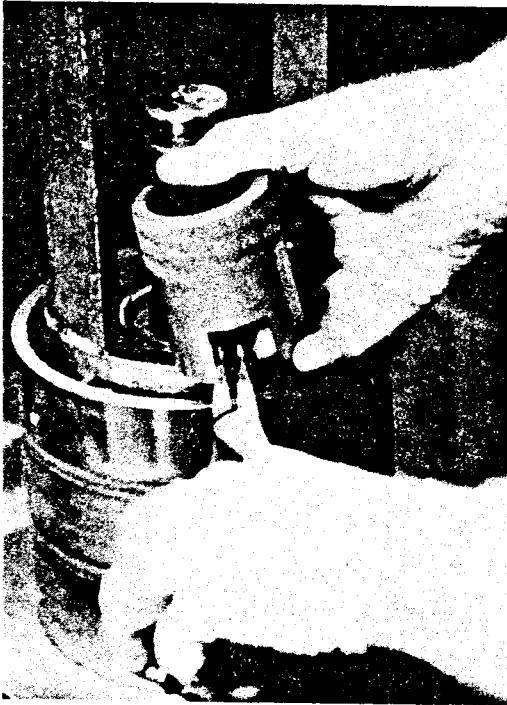


Fig. 194

Install the retainer snap ring.



Fig. 195

Make sure the retainer snap ring  
is in the snap ring groove.

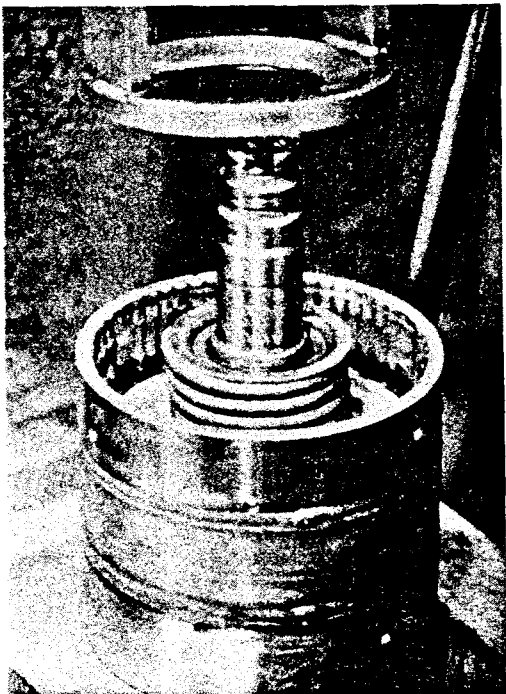


Fig. 196

Remove the special pressing tool.  
Be careful when this is done. If  
the snap ring is not properly seated  
serious injury could be the result.

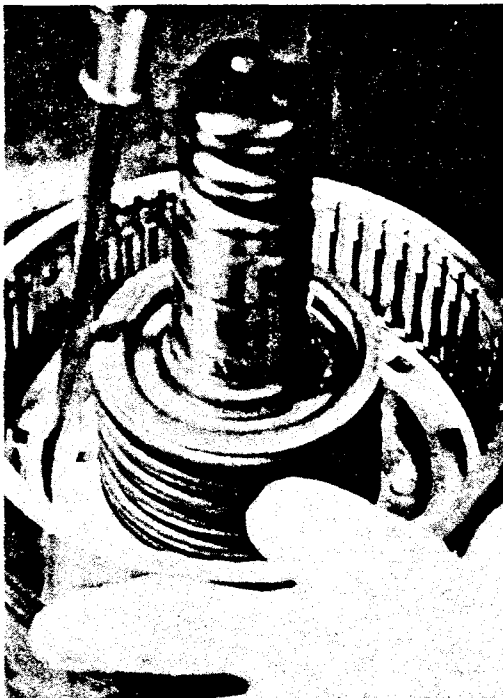


Fig. 197

Make sure the clutch spring is  
centered on the clutch spring  
retainer.

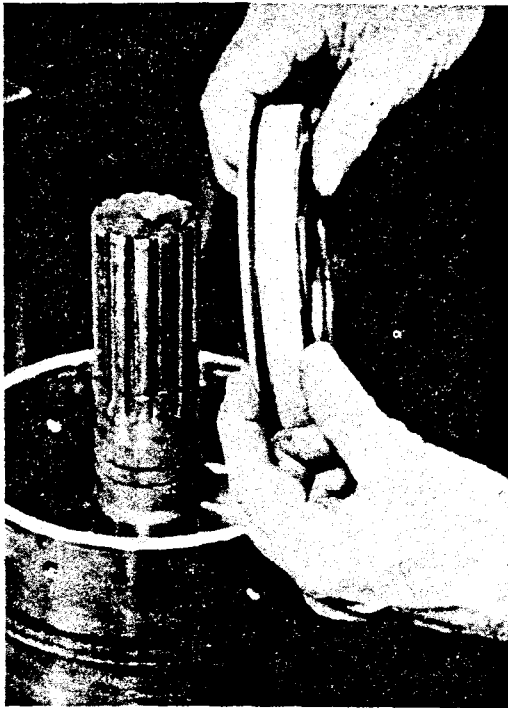


Fig. 198

Turn the welded clutch assembly over and install the thin clutch piston with the "O"ring and seal ring. Refer to figures 185 thru 197.

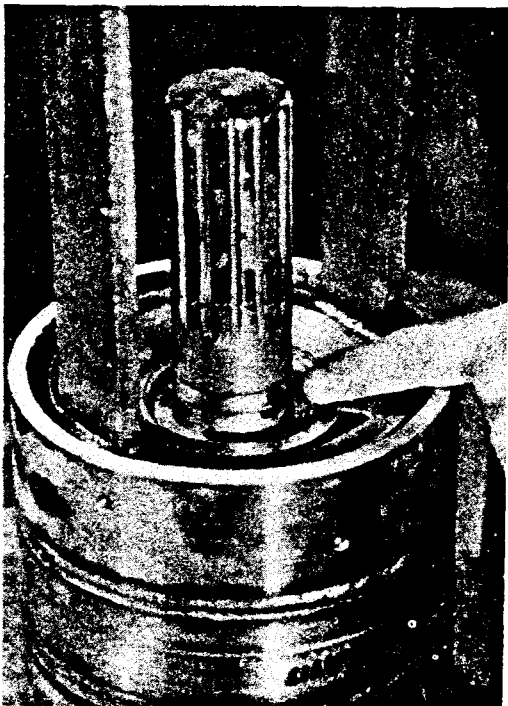


Fig. 199

Install the snap ring. Refer to figures 194 thru 196.



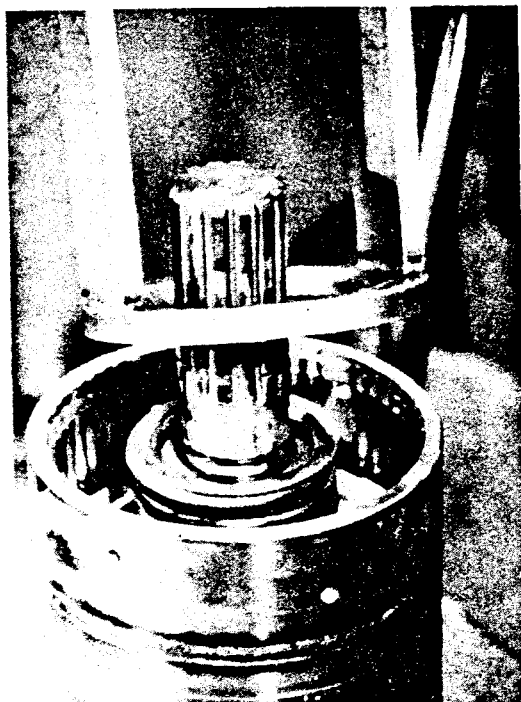


Fig. 200

Remove the special pressing tool. Center the spring as in figure 197.

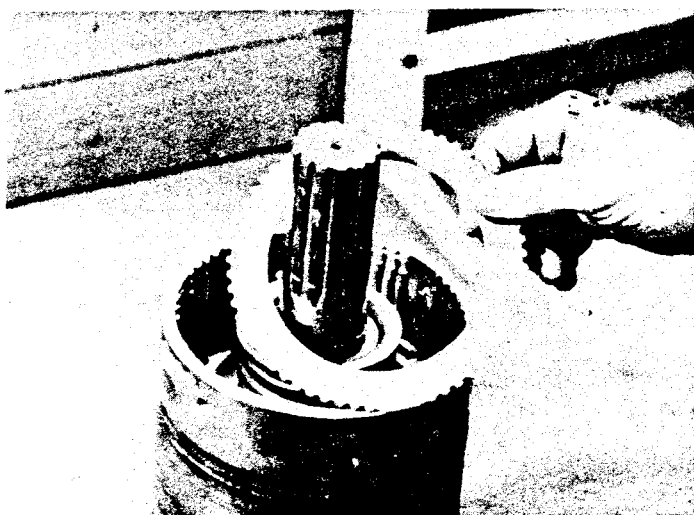


Fig. 201

Install a metal separator plate as shown with the coating of clean automatic transmission oil, next to the clutch piston.

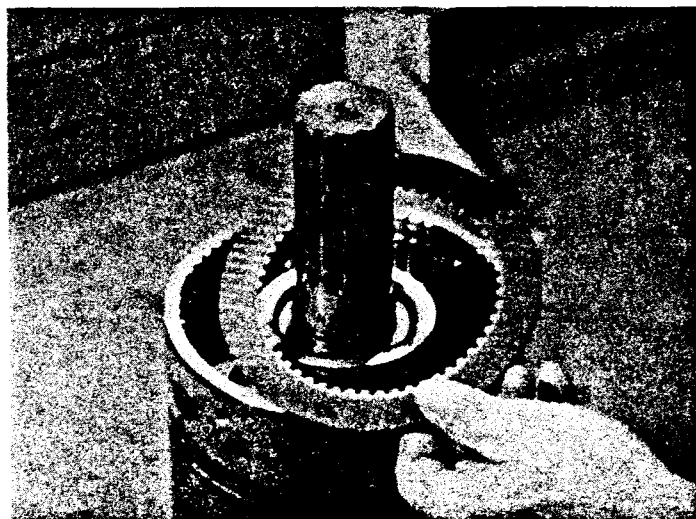


Fig. 202

Install a clutch plate as shown with a coating of clean automatic transmission oil.

**CAUTION:** When necessary to clean the clutch plates, do not use compressed air to dry. Drip dry only. Using compressed air may cause graphitic clutch plates to flake off.

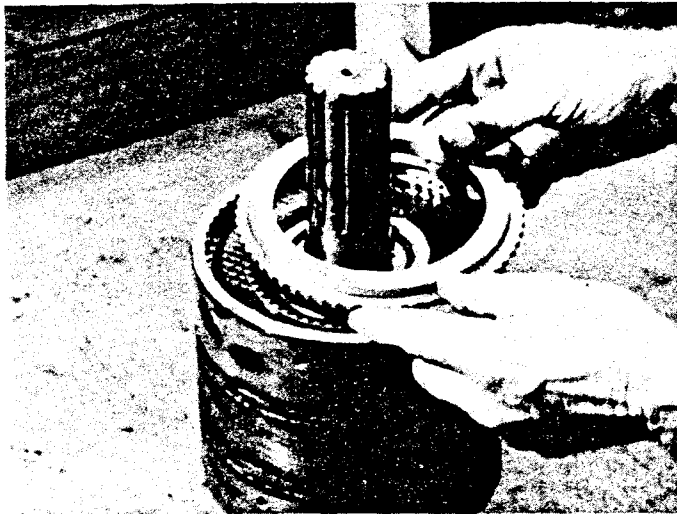


Fig. 203

Install a separator plate, then a clutch plate. By following this same sequence through the assembly the last plate into the cylinder will be a clutch plate. Install the clutch retainer plate as shown.



Fig. 204

Install the snap ring as shown.



Fig. 205

Be sure the snap ring is properly seated in the snap ring groove.

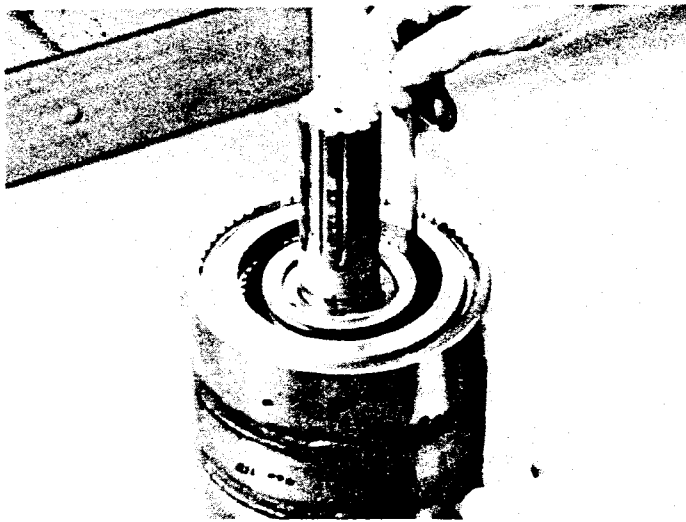


Fig. 206

Align all the clutch discs as shown.  
Using a thin blade screwdriver, etc.

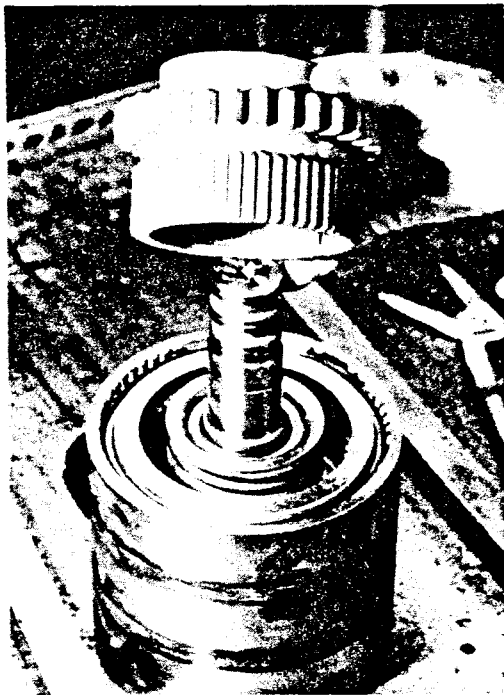


Fig. 207

Turn the clutch weld assembly over  
and install the gear and hub weld  
assembly.

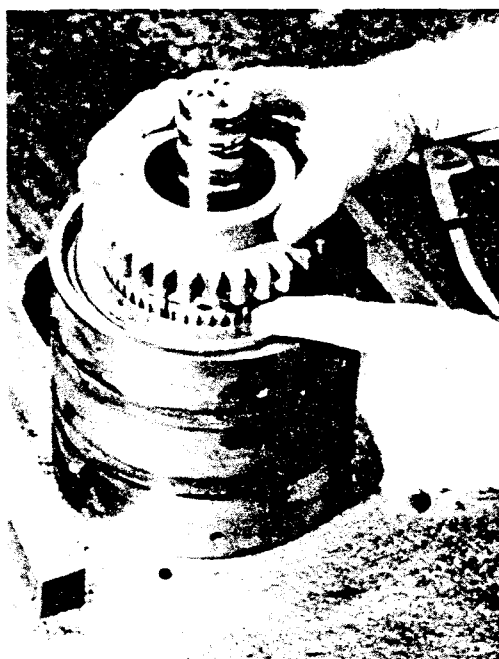


Fig. 208

Gently lower the gear and hub weld  
assembly, making sure the gear  
teeth pass through the clutch plate  
gear teeth.

CAUTION: Do not force or drive with  
a hammer.

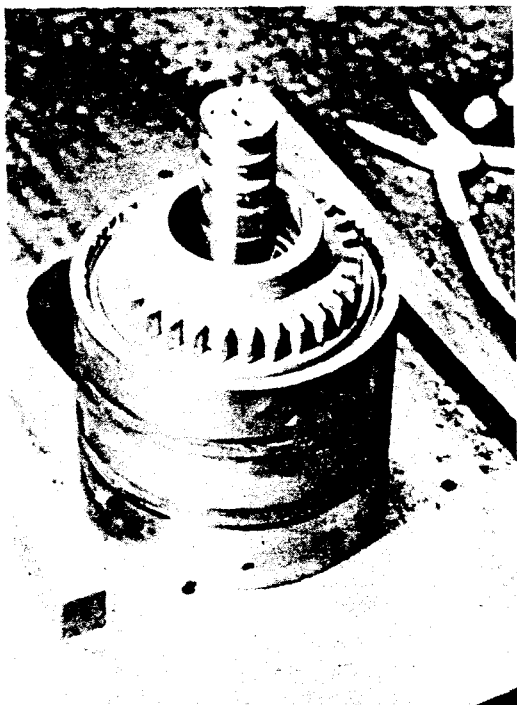


Fig. 209

Be sure gear and hub weld assembly seats all the way into the clutch plates.

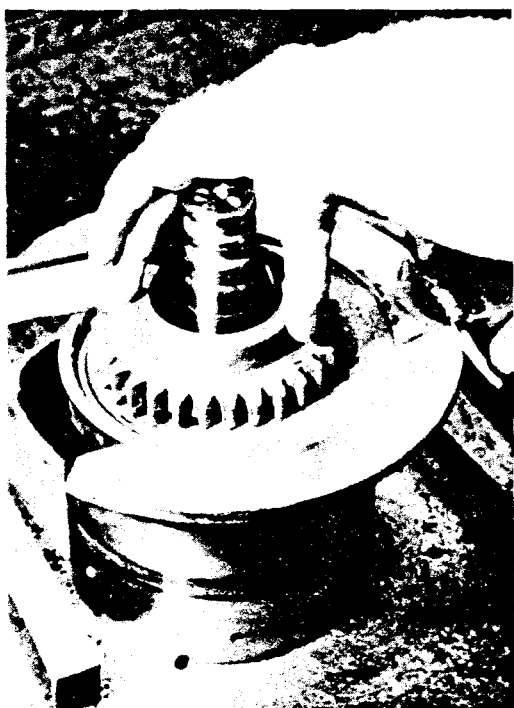


Fig. 210

Raise the gear and hub weld assembly @  $\frac{3}{8}$ " and install the  $\frac{1}{4}$ " thick special holding tool.

NOTE: The special holding tool is used to hold gear hub up to prevent damage to the clutch plates, while bearings are being pressed into hub.

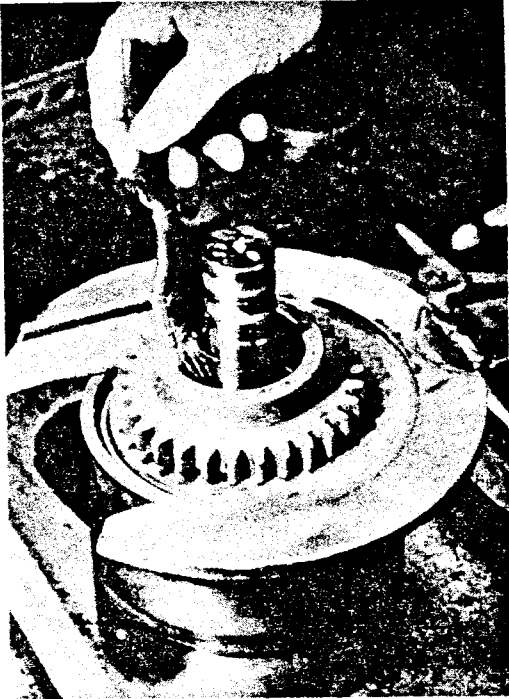


Fig. 211

Apply a small amount of clean automatic transmission fluid to the bearing bore and input shaft.



Fig. 212

Install the inner bearing as shown.

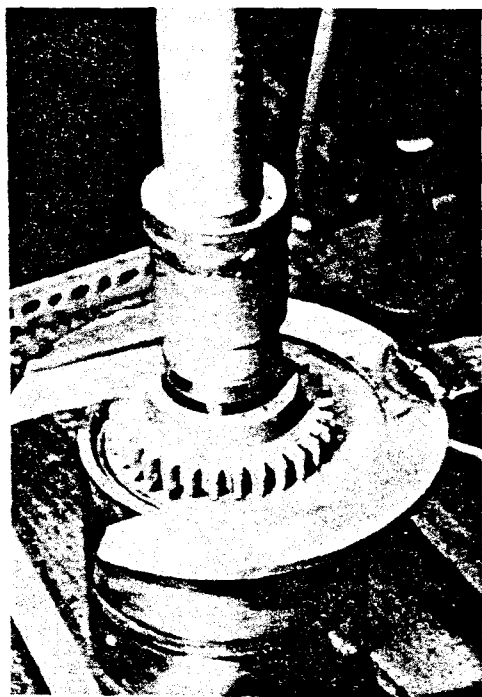


Fig. 213

Using a good type of bearing driver, press the bearing onto the shaft and into the gear and hub weld assembly bore.

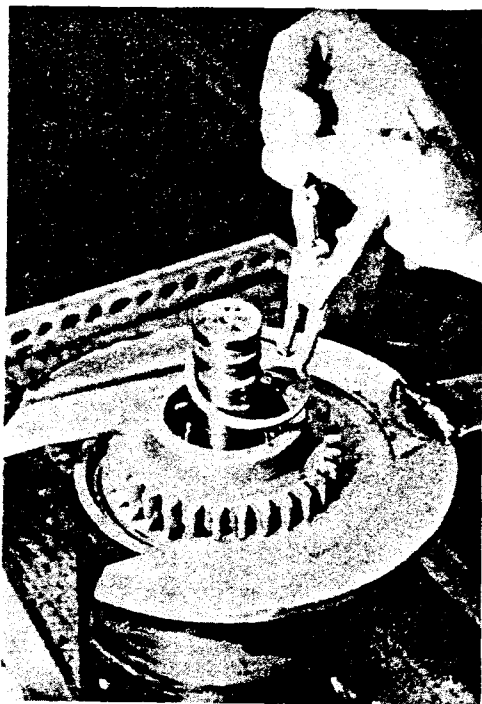


Fig. 214

Install retainer snap ring.

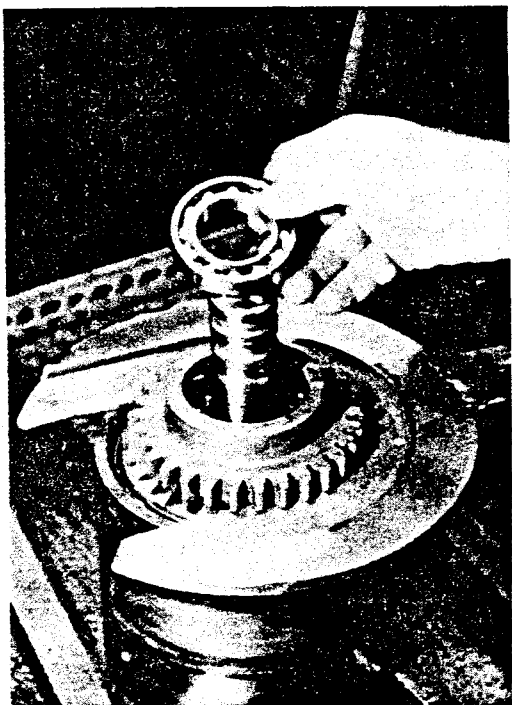


Fig. 215

Install the outer bearing.

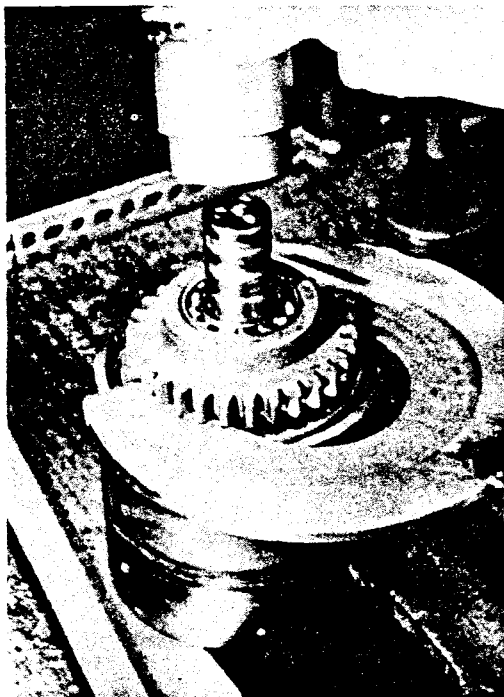


Fig. 216

Press the outer bearing into the bore until it seats onto the retainer snap ring.

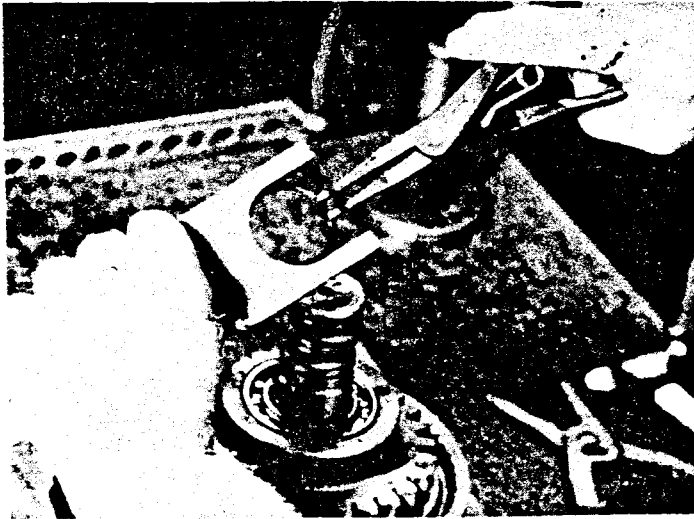


Fig. 217

Install the retainer snap ring.

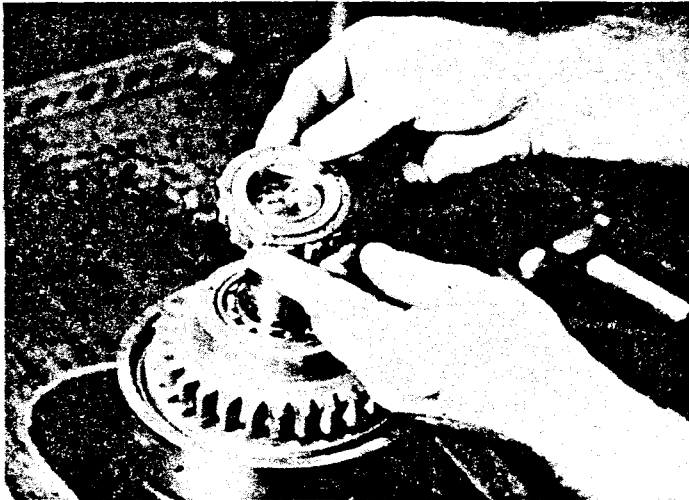


Fig. 218

Install the rounded or beveled edge in the I.D. of the bearing toward the clutch assembly.

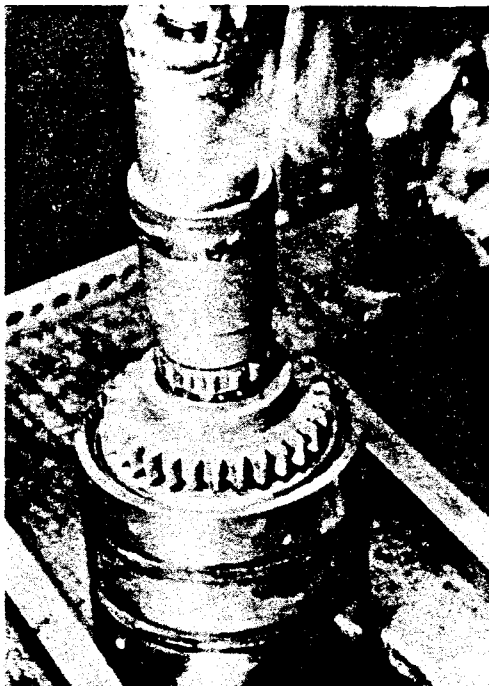


Fig. 219

Press the bearing on the shaft down to the snap ring.



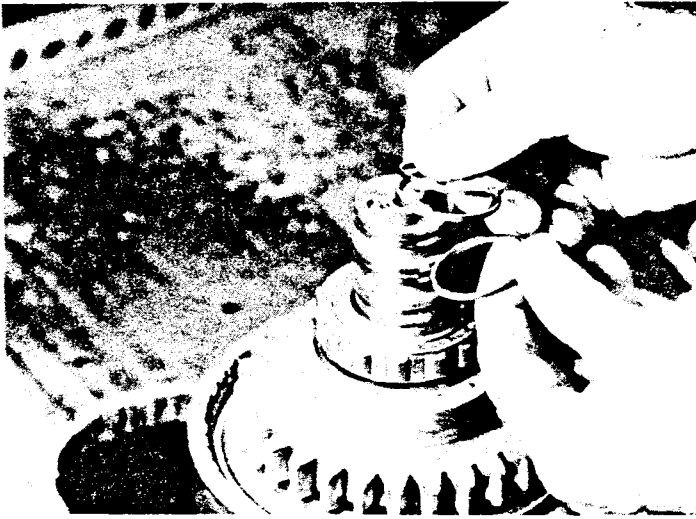


Fig. 220

Install the first seal ring next to the bearing.



Fig. 221

Install the second seal ring in the middle groove.

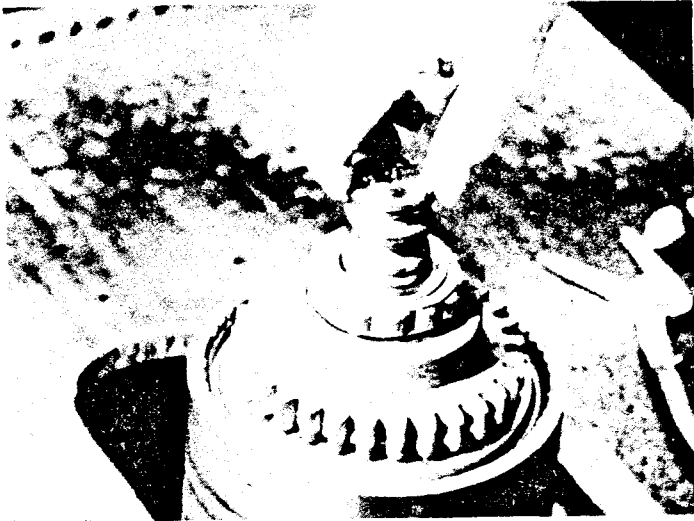


Fig. 222

Install the third seal ring in the outer groove.



Fig. 223

Lock all three seal rings. Make certain all three seal rings will turn freely in groove.



Fig. 224

Turn the clutch assembly over.

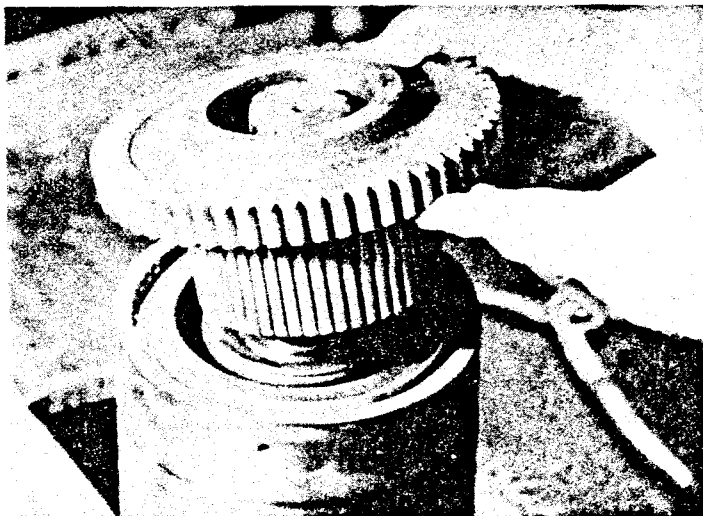


Fig. 225

Install the gear and hub weld assembly as described in figure 206 thru 217, with this exception.

This will require a  $\frac{7}{8}$ " thick special tool instead of  $\frac{1}{4}$ ".

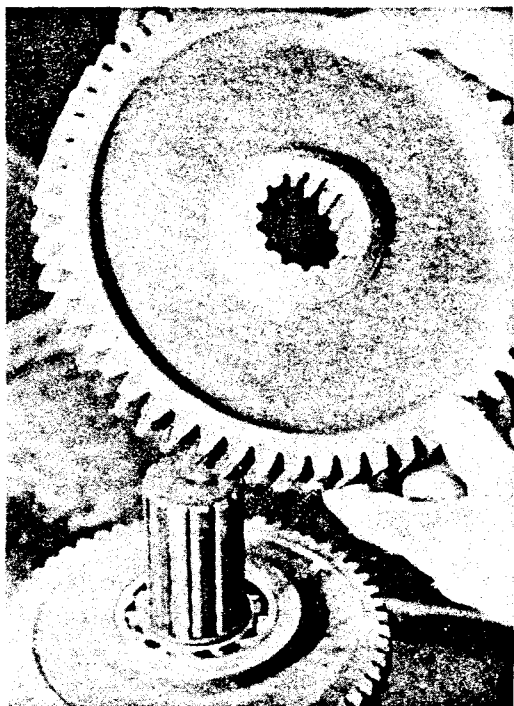


Fig. 226

Install the gear on the spline as shown.

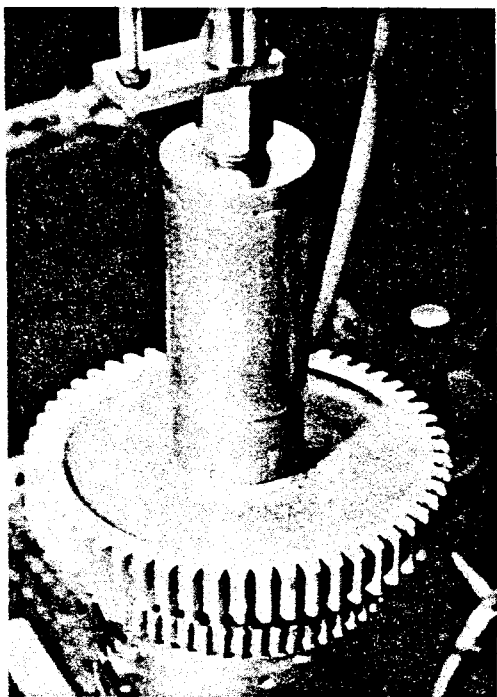


Fig. 227

Using a good type of bearing driver, press the gear onto the shaft until it seats on the snap ring.

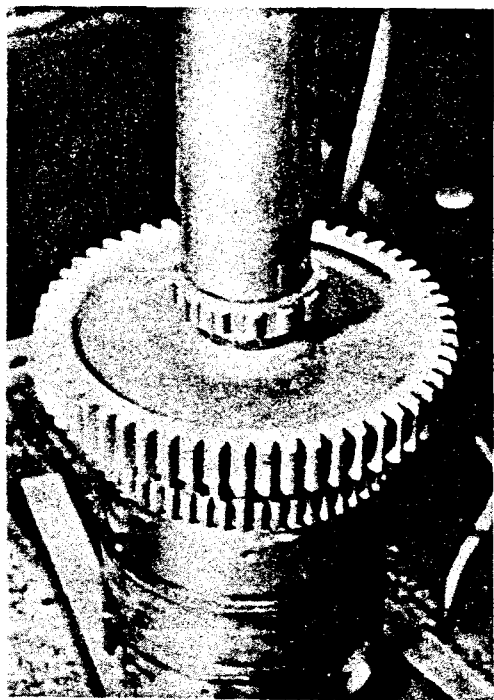


Fig. 228

Install the bearing in the same manner as described in paragraph 218 and 219.

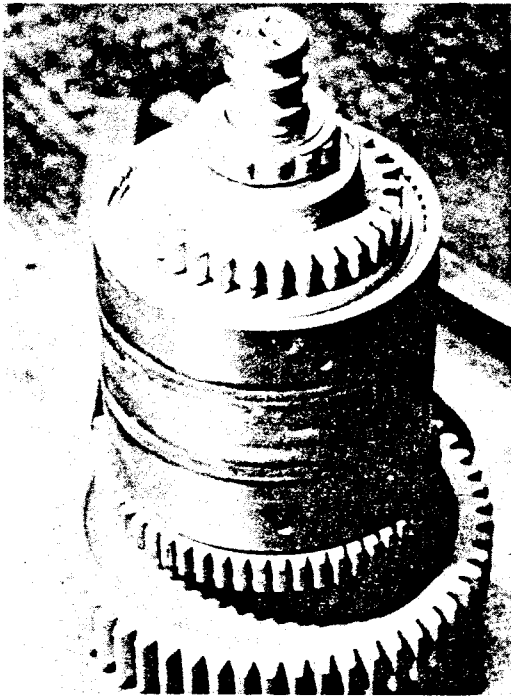


Fig. 229

This is the assembled clutch stack.

NOTE: The remaining assemblies will be assembled in the same manner, xcept the high gear which has less clutch and seperator plates and uses a thinner piston.

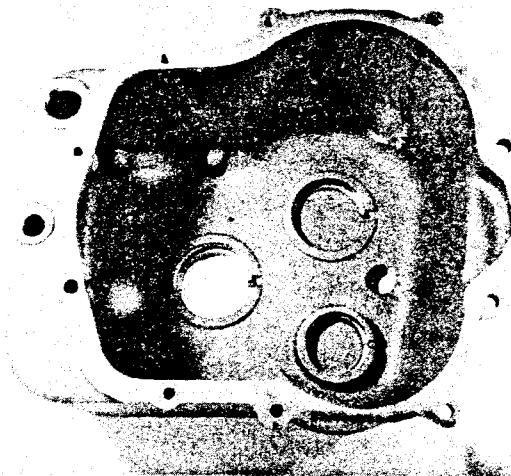


Fig. 230

This is the main case for the 9 5/8" drop transmission. Assembly instructions will be from figure 231 thru 266,

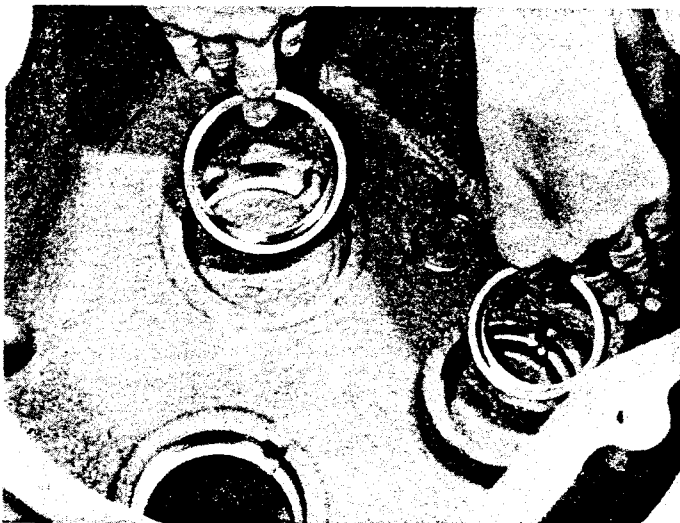


Fig. 231

Install the bearing races in the main case as shown.



Fig. 232

Use a bearing driver and seat the bearing races in the main case.

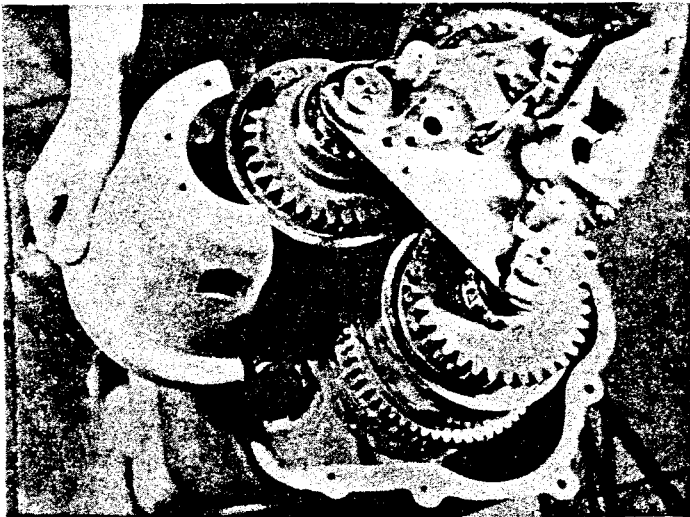


Fig. 233

Assemble the clutch stacks in the special lifting bracket. NOTE: Refer to page 15 for clutch stack layout. Install the baffle plate with clutch stacks short drop 9" only.

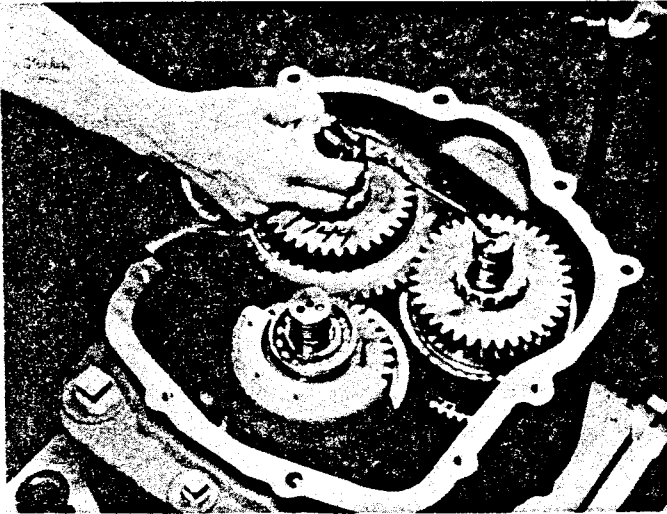


Fig.234

Install the clutch stacks in the main case. Have the case in position as shown. Apply clean automatic transmission oil to the input shafts.

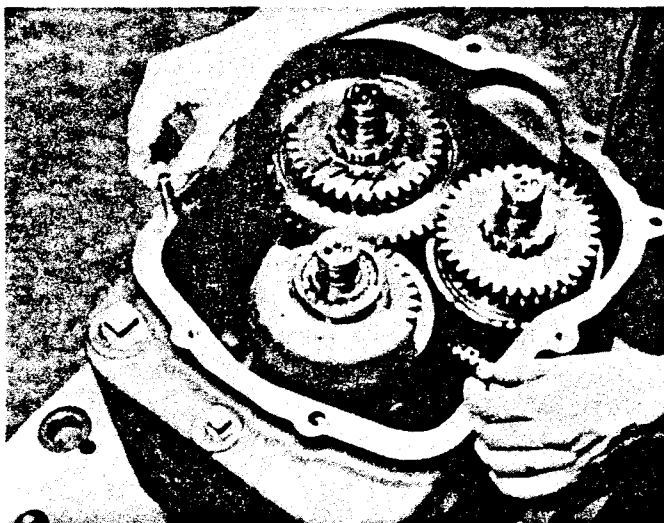


Fig.235

Install two  $2\frac{1}{2} \times \frac{1}{2} - 13$  guide pins as shown.

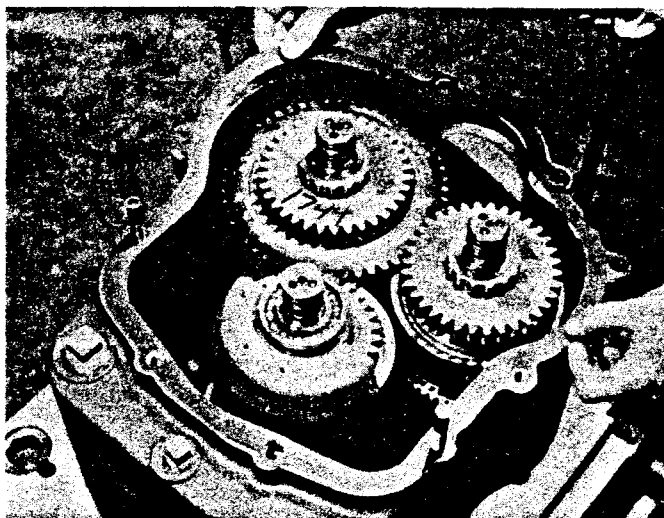


Fig.236

Install the main housing gasket as shown on the guide pins.



Fig. 237

For safety during installation, use a lift chain bolted to the front cover.

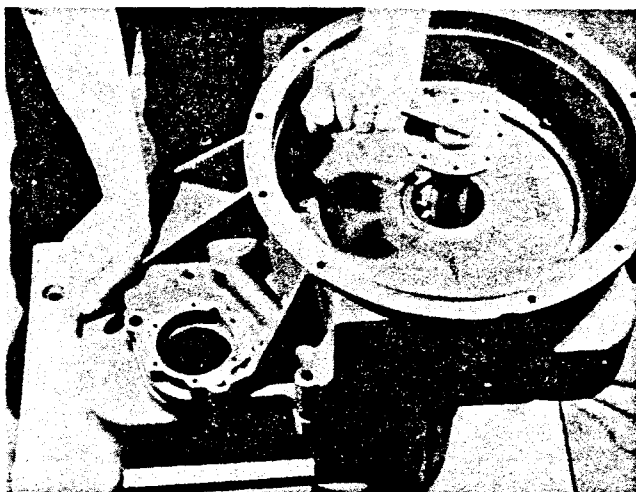


Fig. 238

Install the front cover on the main case.

CAUTION: Be extra careful as not to damage the seal rings on the clutch stacks. Rotate the input shaft to align the gears.

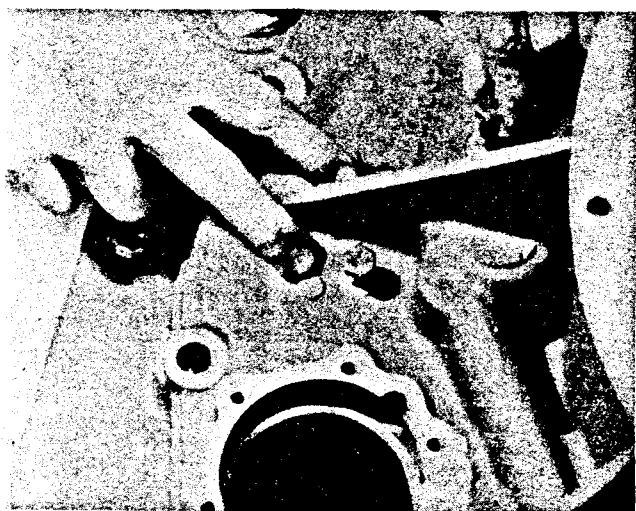


Fig. 239

Align and install the capscrews for the baffle plate on short 9" drop. CAUTION: Do not over-torque the capscrews, as this may result in damage to the baffle plates.



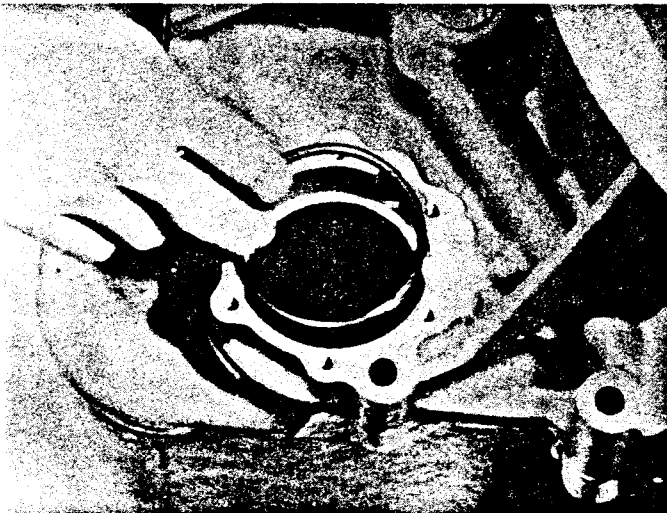


Fig. 240

Install the sump tube "O" ring as shown.

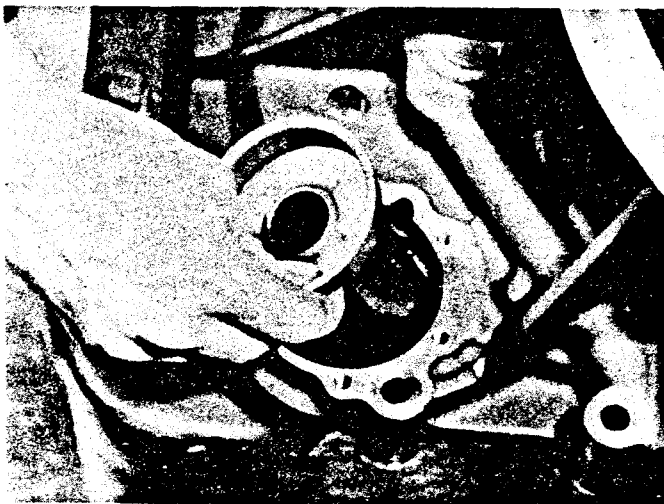


Fig. 241

Install the oil sump tube. The ear on the sump will fit in the notch on the front cover.

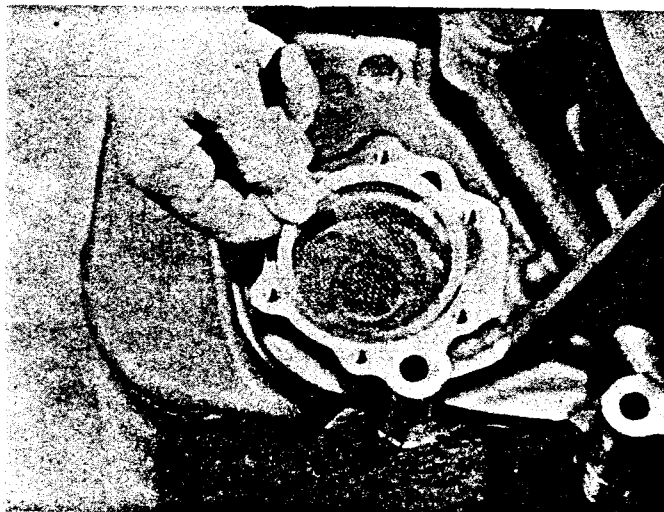


Fig. 242

Install the oil strainer screen.

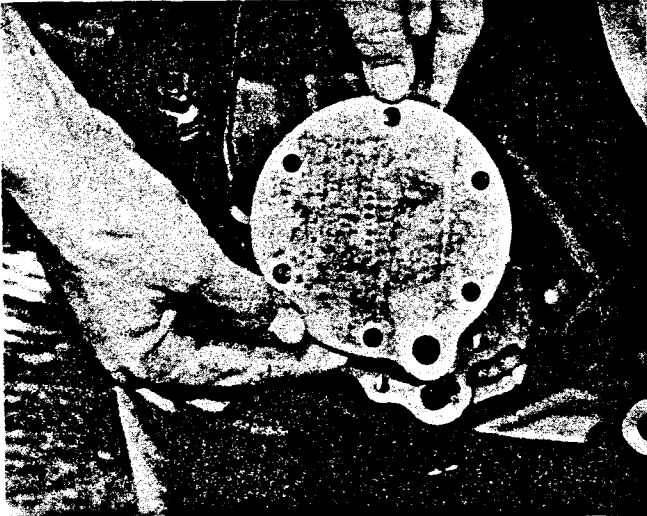


Fig. 243

Install the oil strainer cover plate with a gasket.

NOTE: This gasket must be replaced any time the cover plate is removed. Install the capscrews and torque to 17 ft. lbs.

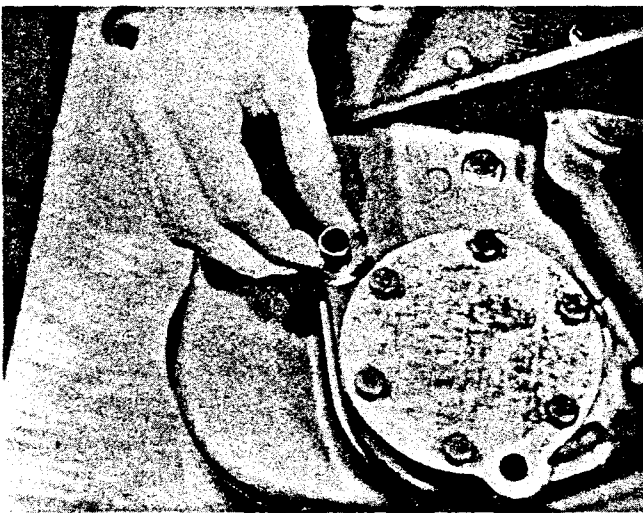


Fig. 244

Install the locating bushing as shown.

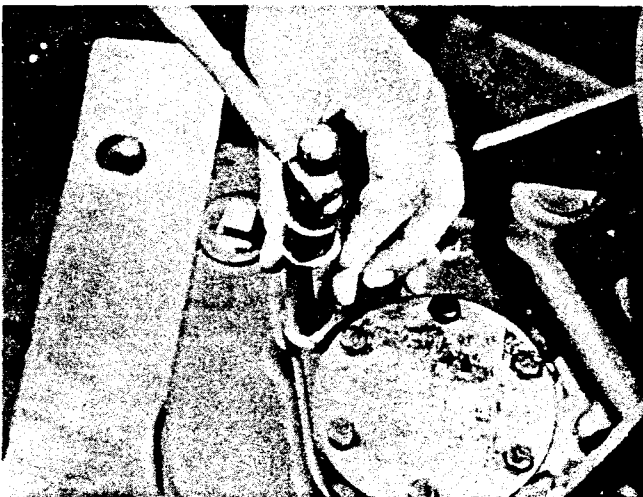


Fig. 245

Use a bushing driver and drive the bushing into the main case.

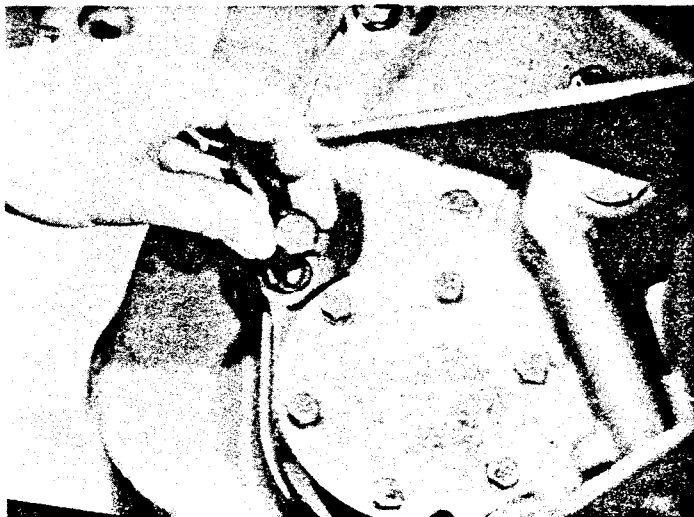


Fig. 246

Install one  $\frac{1}{2}$  - 13 x 2 cap screw into the locating bushing.



Fig. 247

Install the locating bushing as shown.



Fig. 248

Use the same procedure for installation as described in figure 245.

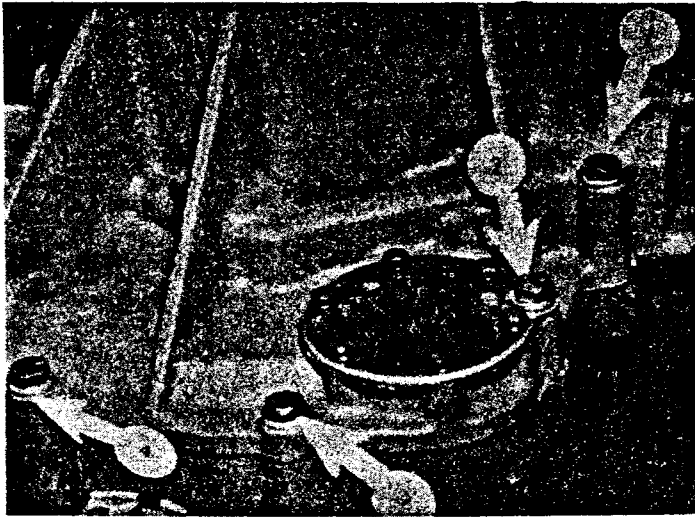


Fig. 249

This shows the bolt length and locations.

- #1.  $\frac{1}{2}$  - 13 x  $3\frac{1}{4}$
- #2.  $\frac{1}{2}$  - 13 x  $2\frac{1}{2}$
- #3.  $\frac{1}{2}$  - 13 x 2
- #4.  $\frac{1}{2}$  - 13 x  $1\frac{1}{2}$

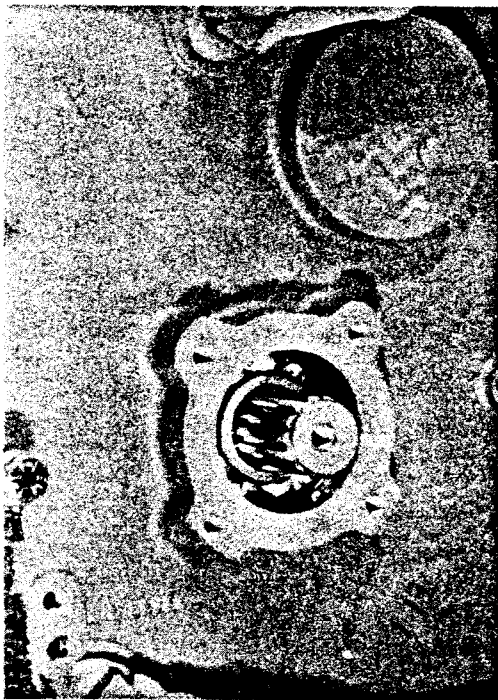


Fig. 250

Turn the power shift transmission over and in stall the two  $1\frac{1}{4}$  " N.P.T. plug.



Fig. 251

Install the two  $\frac{1}{4}$ " N.P.T. oil level check plugs.



Fig. 252

Apply a small amount of permatex sealer to the main case at the seal location as shown.

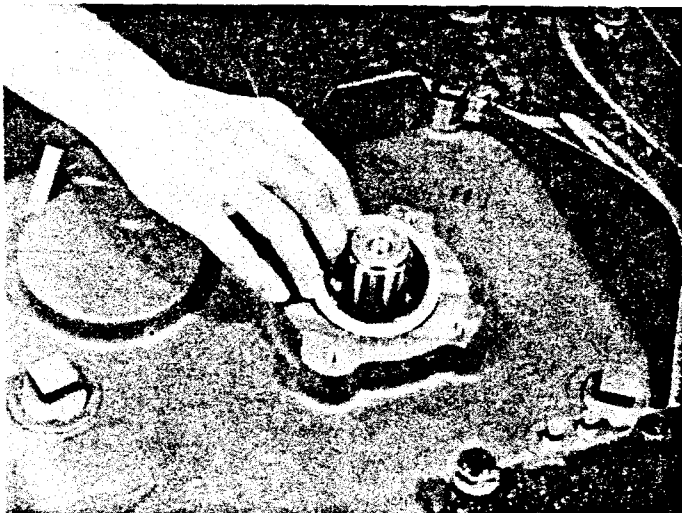


Fig. 253

Install the seal with the lip down or toward the transmission as shown.



Fig. 254

Use a seal driver and drive the seal into the case. Take care not to damage the seal.

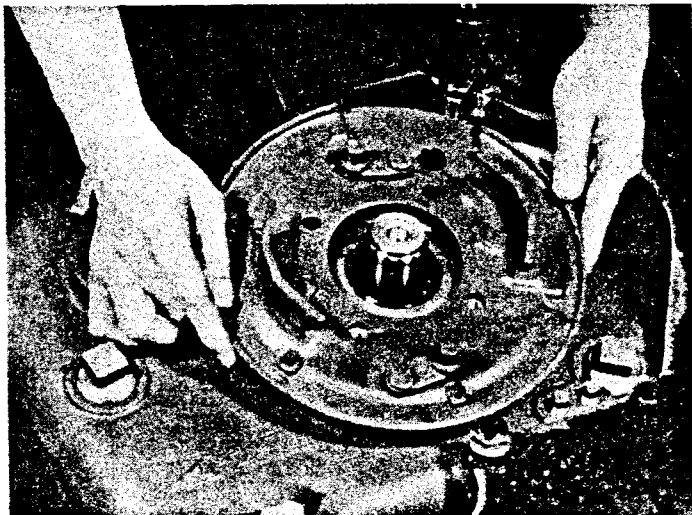


Fig. 255

Install the brake backing plate and capscrews as shown. Torque the capscrews to the proper torque setting.

NOTE: See grade 5 bolt torque valve chart.

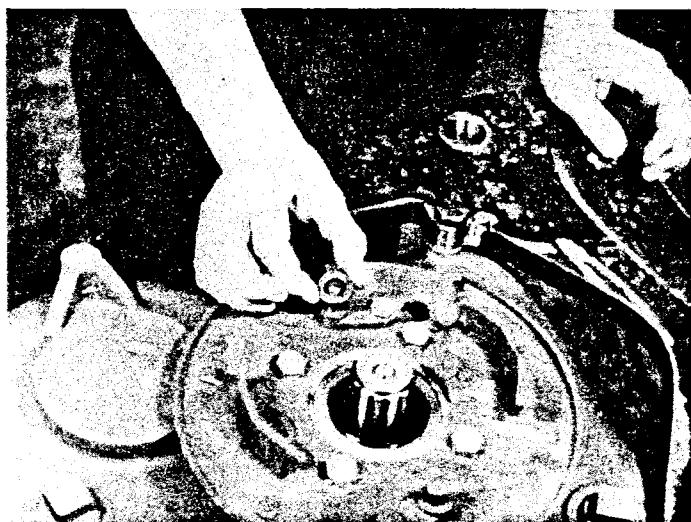


Fig. 256

Install the spacer.

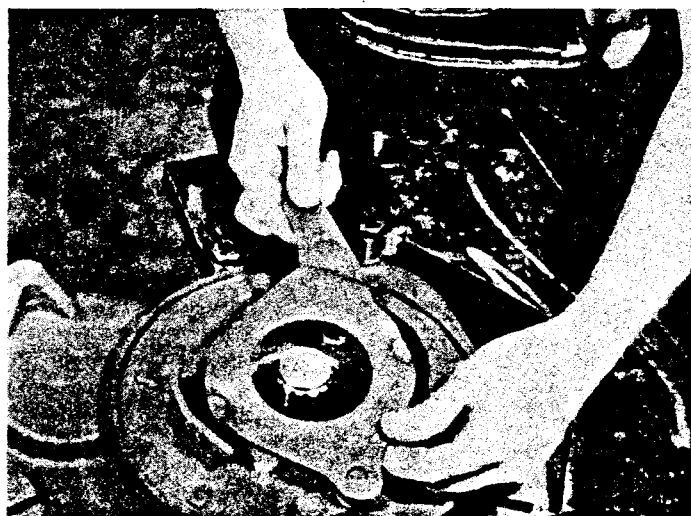


Fig. 257

Install the bell crank.

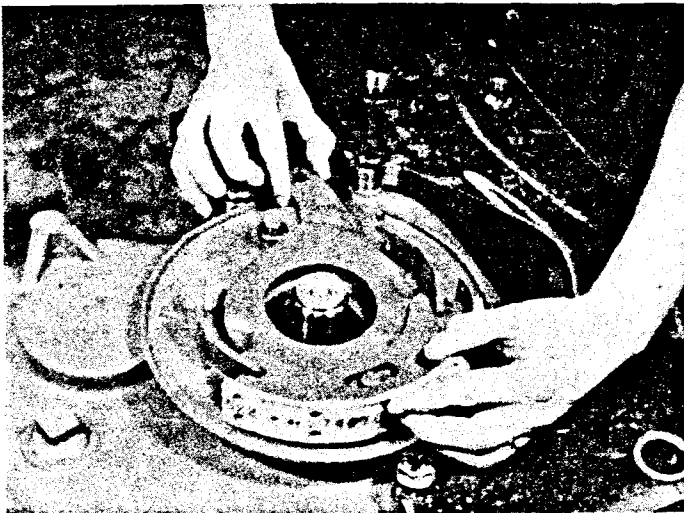


Fig. 258

Install one brake shoe.

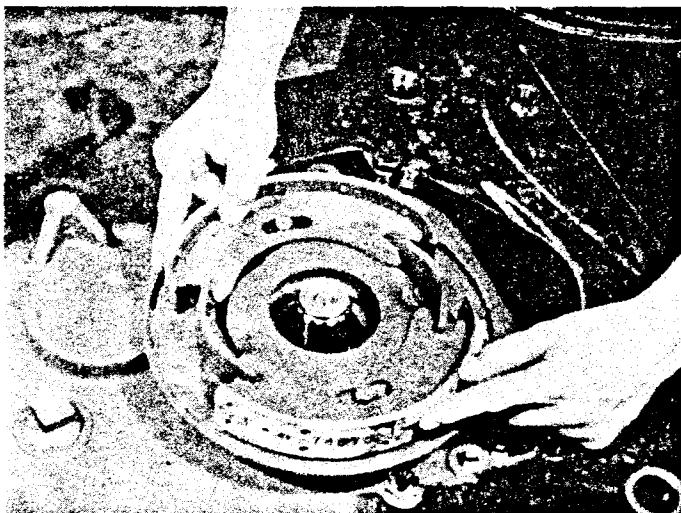


Fig. 259

Install the other brake shoe.

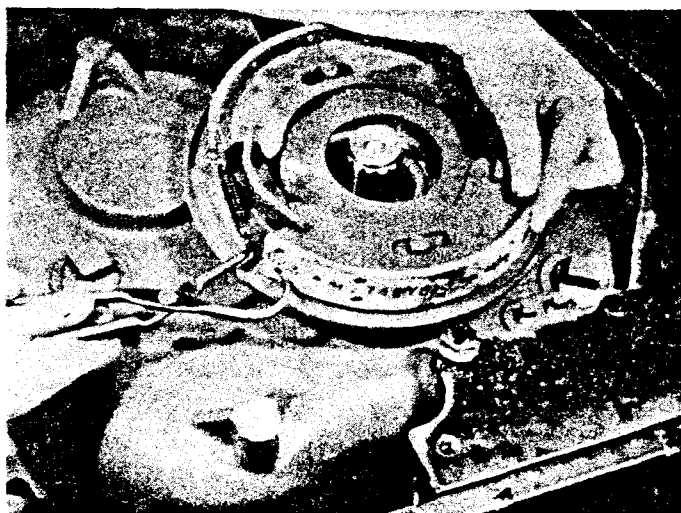


Fig. 260

Install the two return springs.

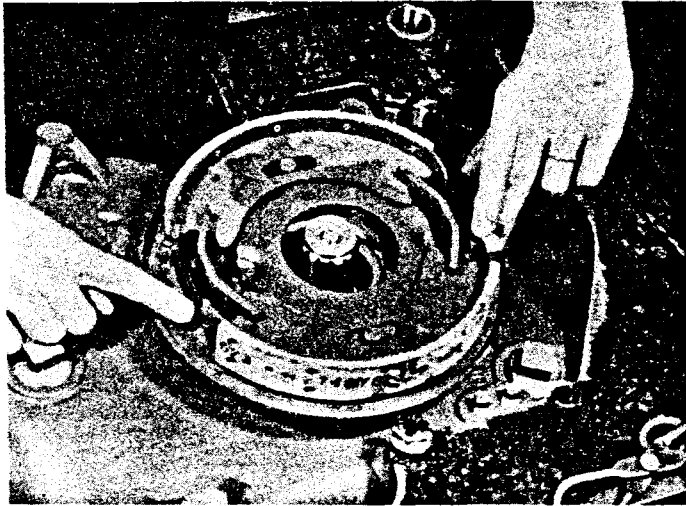


Fig. 261

Center the brake shoes on the backing plate.



Fig. 262

Install the brake drum.



Fig. 263

Install the "O"ring.



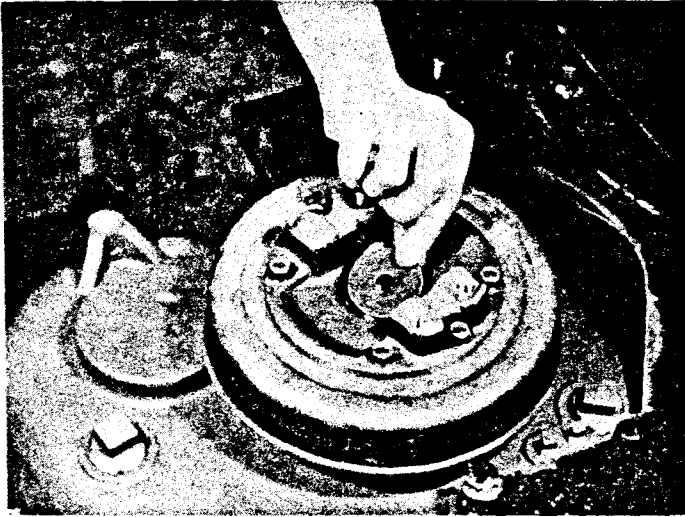


Fig. 264

Install the flat washer.

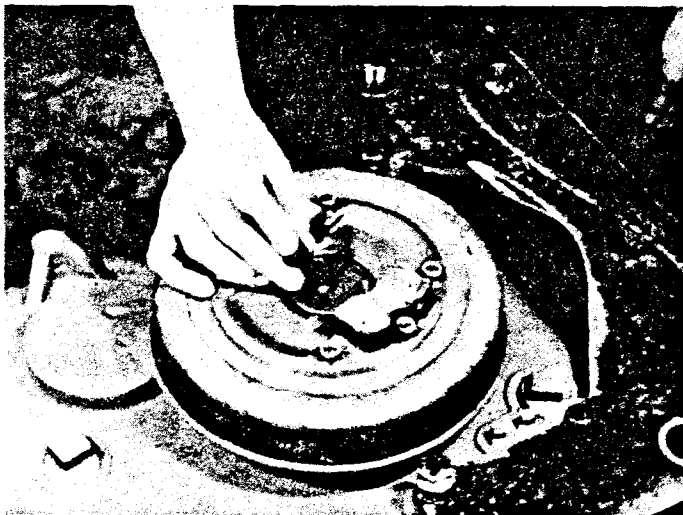


Fig. 265

Install the place bolt. Torque to 85 ft. lbs.

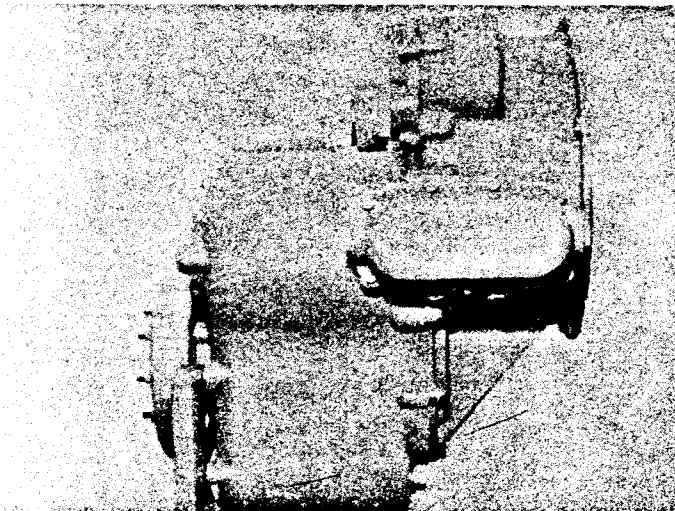


Fig. 266

This is the complete assembled 9 5/8 short drop transmission.

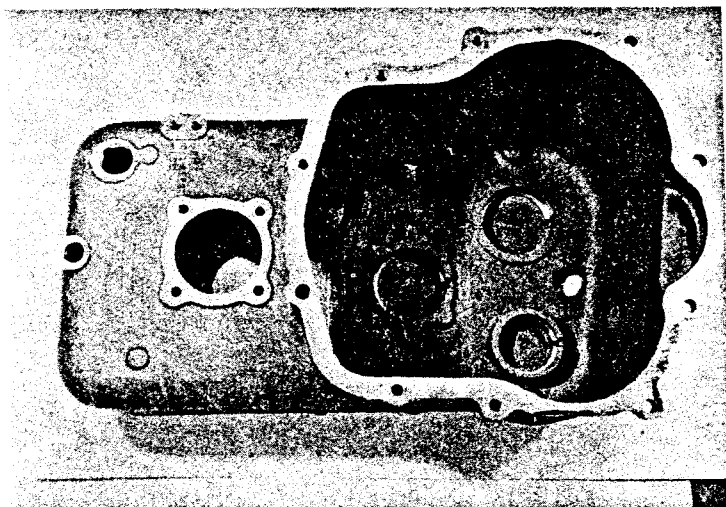


Fig. 267

This is the main case for the 18 5/8 long drop transmission. Assembly instructions will be from figure 268 thru 312.

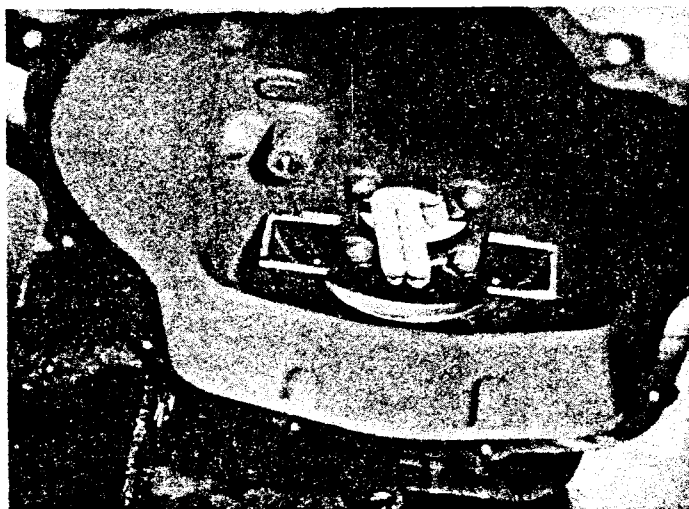


Fig. 268

Install the oil trough as shown.

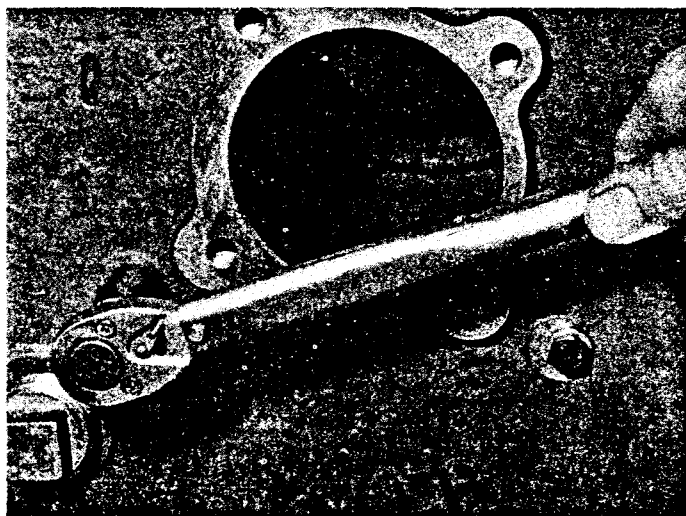


Fig. 269

Install the oil trough capscrews and tighten.

CAUTION: Do not over torque. To do so could result in damage to the oil trough.

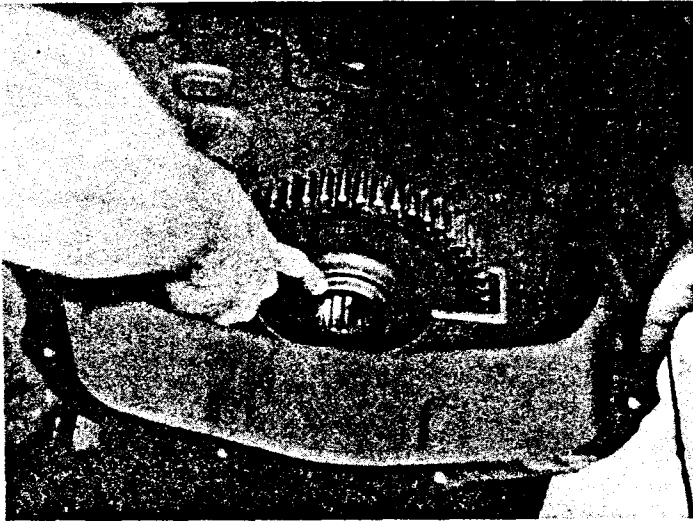


Fig. 270

Install the gear in the oil trough as shown.

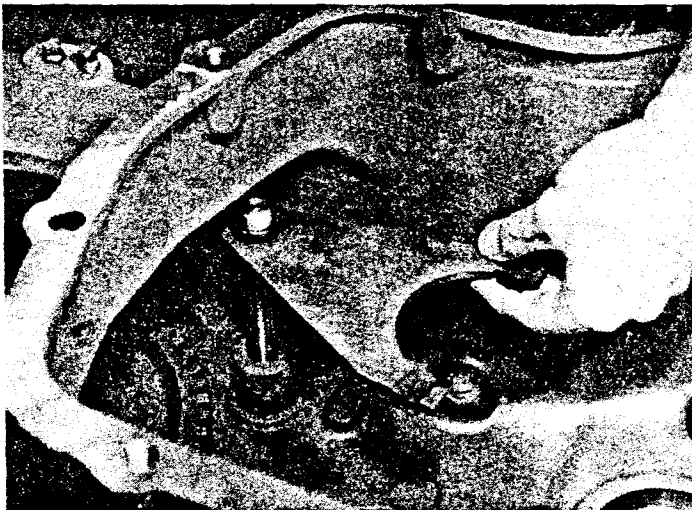


Fig. 271

Turn the main case facing up and install the hi-lo range shifter fork.

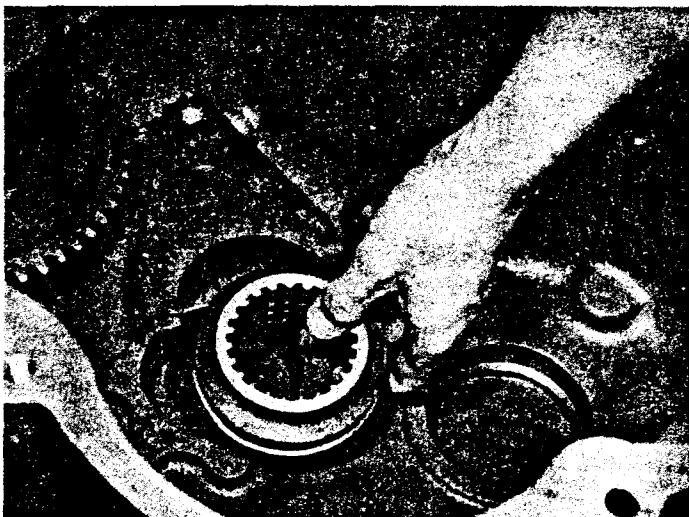


Fig. 272

Install the shifting collar in the hi-lo range fork.

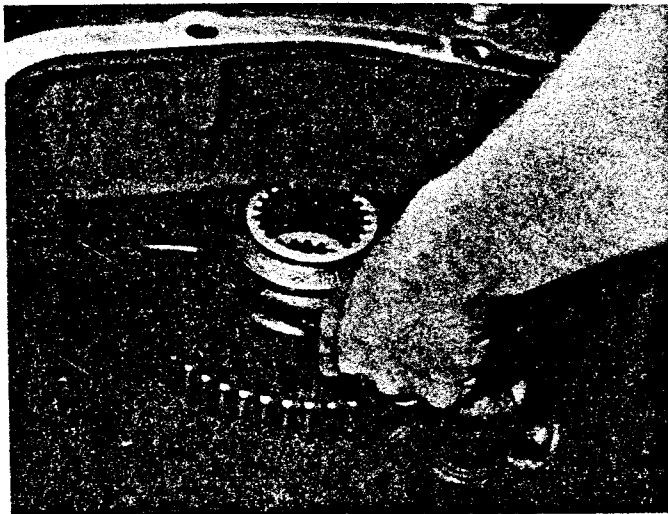


Fig 273

Rotate the shifting fork and shifting collar with the shifting collar resting on the gear as shown.

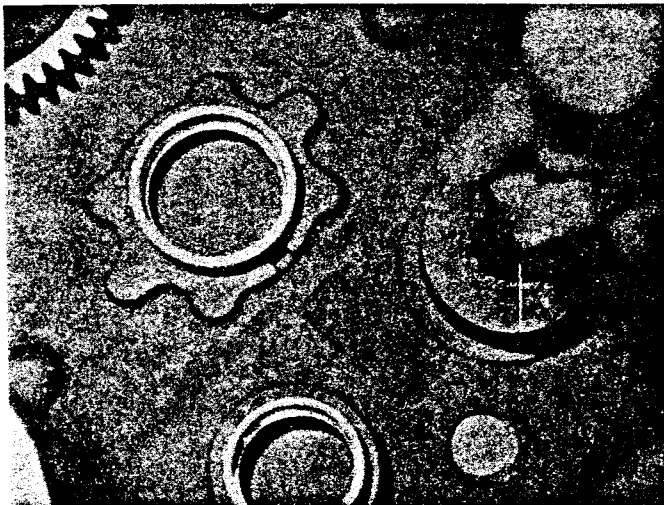


Fig. 274

Install the bearing clutch stack cups. Use a bearing driver to seat into place. Refer to figures 231 and 232



Fig. 275

This is the output shaft and disconnect hub with the detent ring installed in the disconnect hub and the snap ring installed on the shaft.

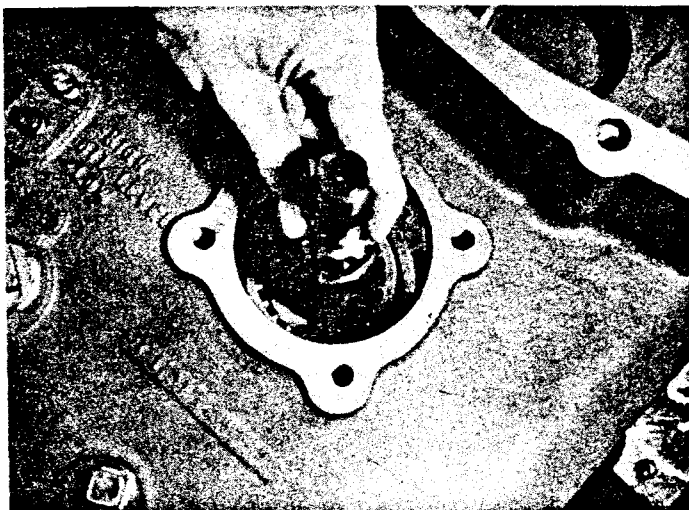


Fig. 276

Install the output shaft and disconnect hub with the pilot on the output shaft facing up as shown.

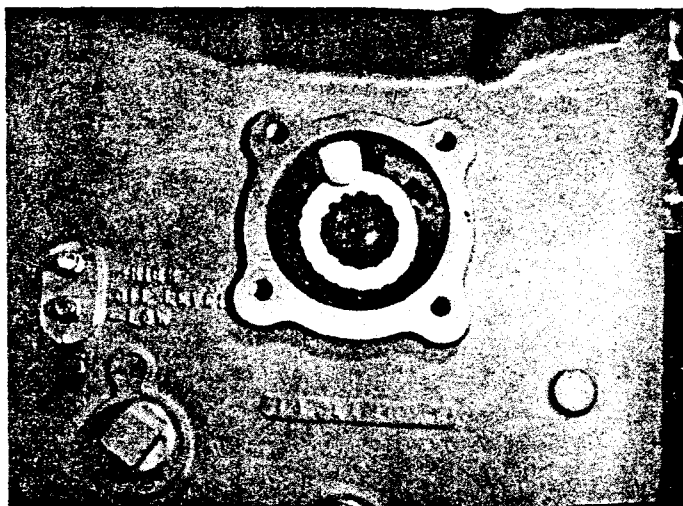


Fig. 277

Align the disconnect hub with the shifting collar as shown.

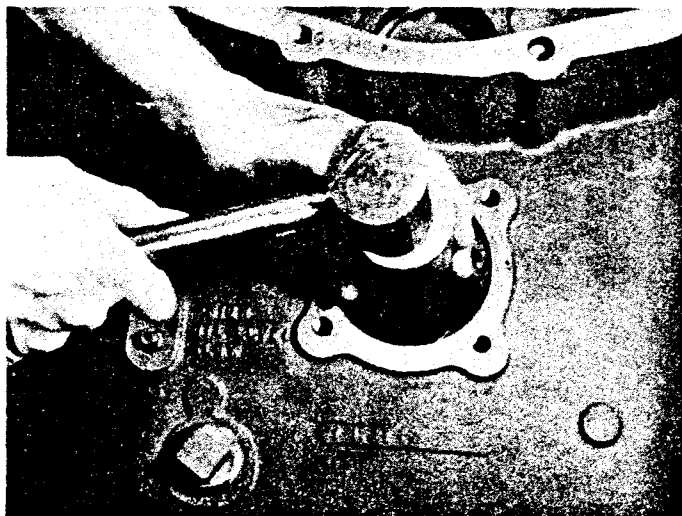


Fig. 278

Use a long bearing driver and gently tap the disconnect hub into the shifting collar.

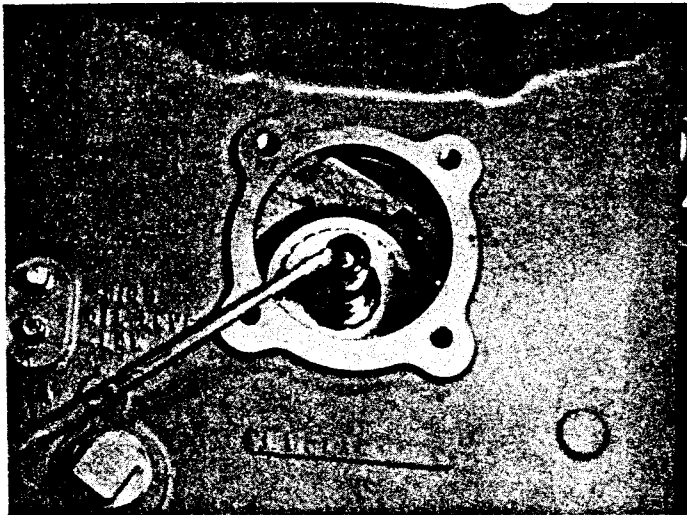


Fig. 279

Apply a small amount of grease to the pilot shaft.

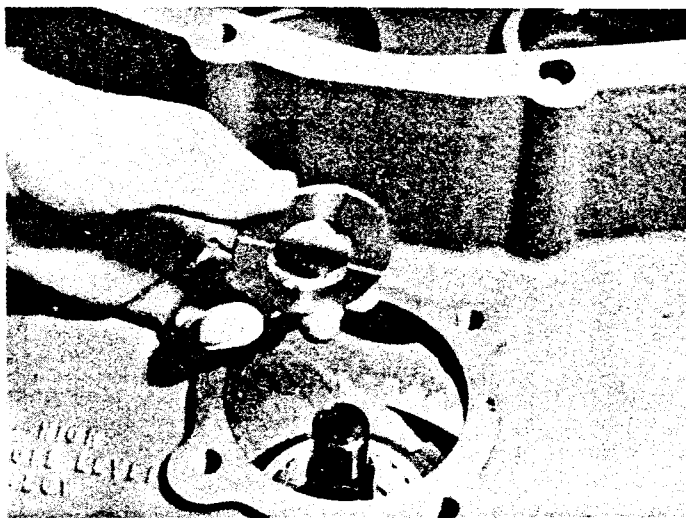


Fig. 280

Install the bronze thrust washer.

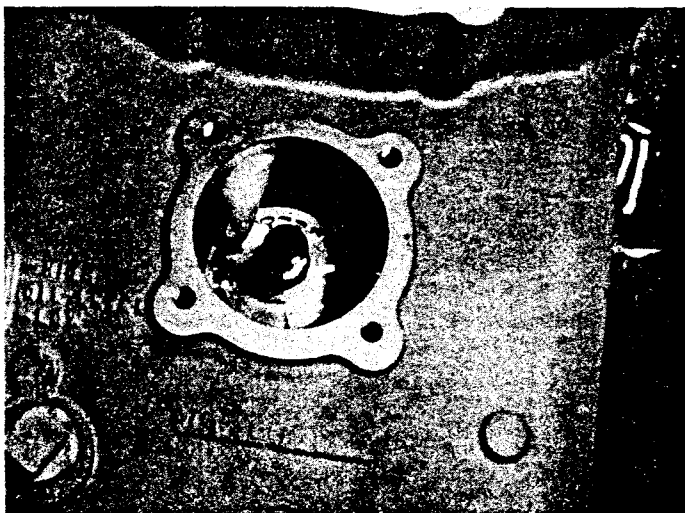


Fig. 281

Be sure the bronze washer is installed all the way on the pilot shaft.

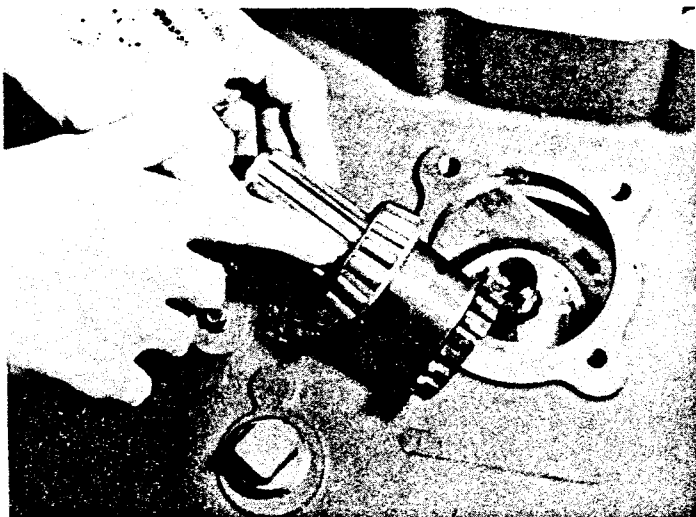


Fig. 282

Press the bearing on the shaft as shown.

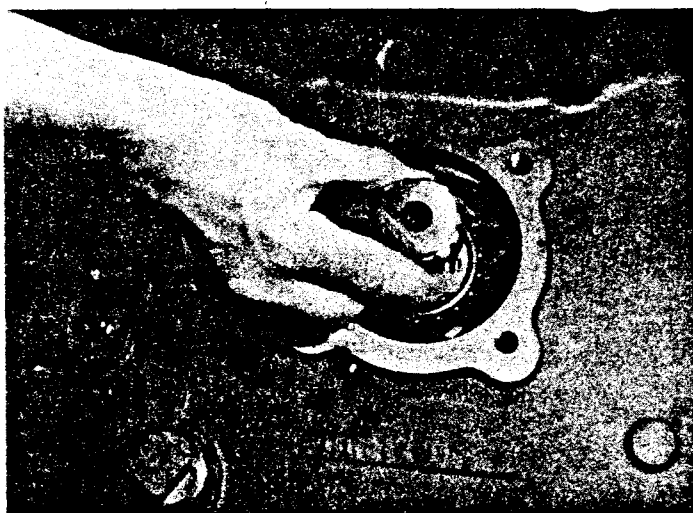


Fig. 283

Install the shaft as shown.

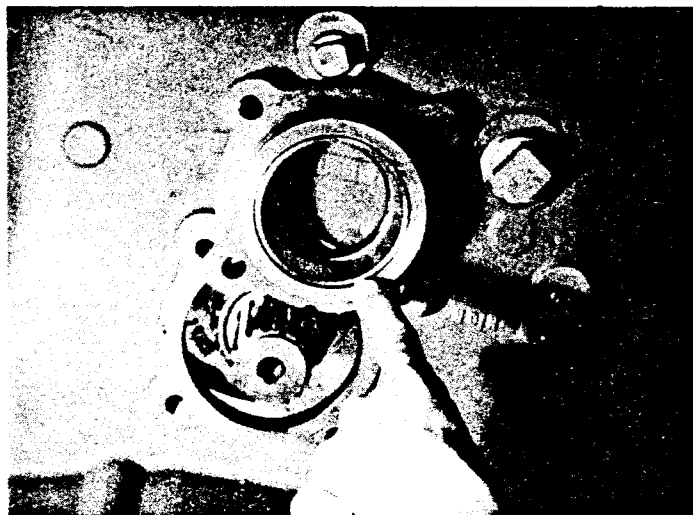


Fig. 284

Press the bearing cup into the bearing retainer as shown.

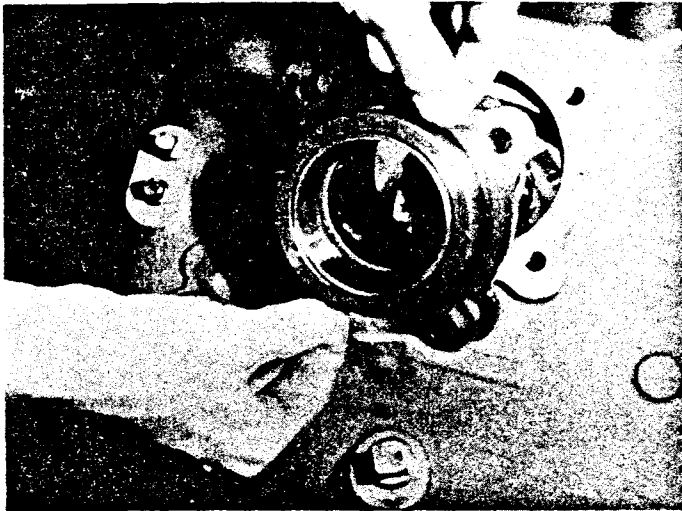


Fig. 285

Install a .015 bearing retainer shim gasket as shown.

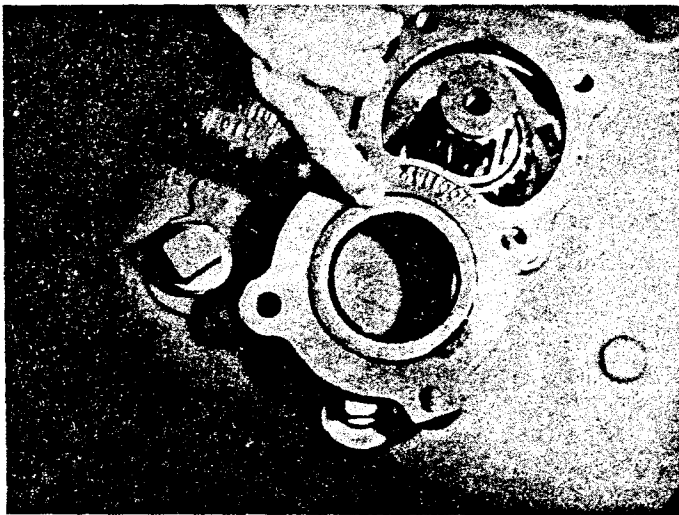


Fig. 286

Press the oil seal in the bearing retainer by using a seal driver, being careful not to damage the seal. Install the seal as shown with the lip down.

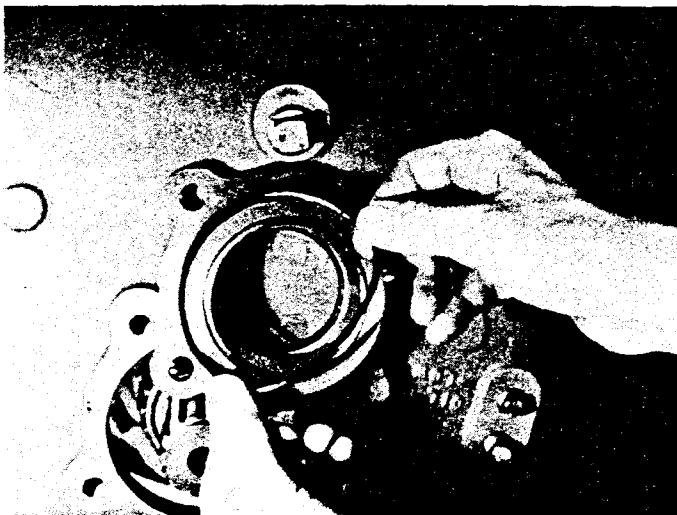


Fig. 287

Install the bearing retainer "O"ring as shown.



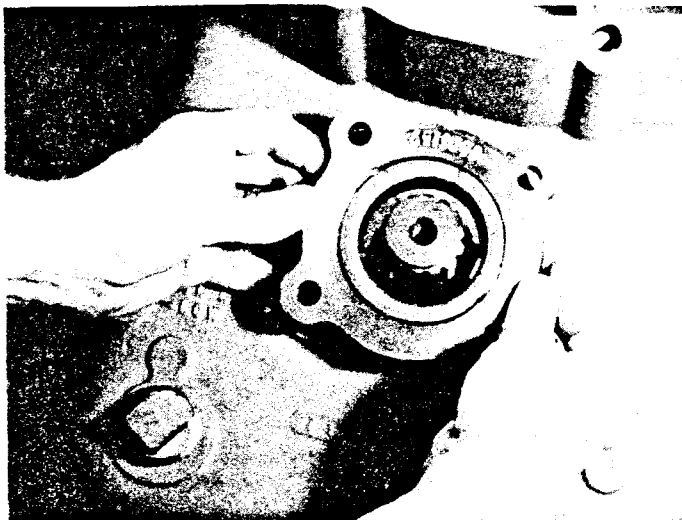


Fig. 288

Install the bearing retainer and snap rings.

NOTE: Make certain the bearing retainer is completely down. Do not pull down with capscrews. To do so will result in severe damage to the retainer.

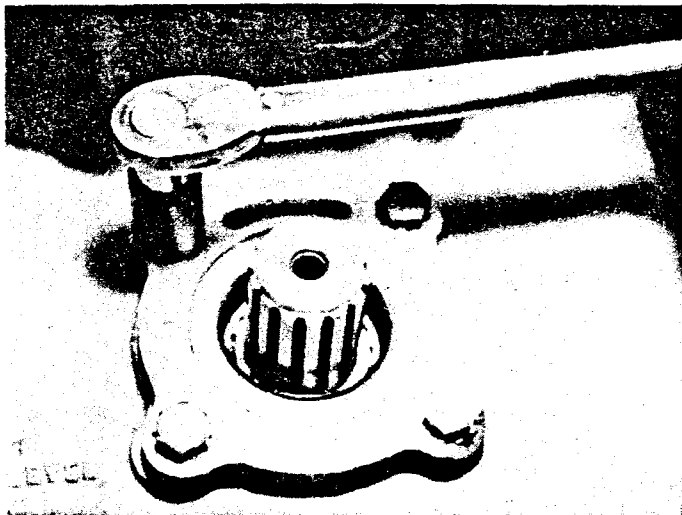


Fig. 289

Torque the capscrews to 75 ft. lbs.

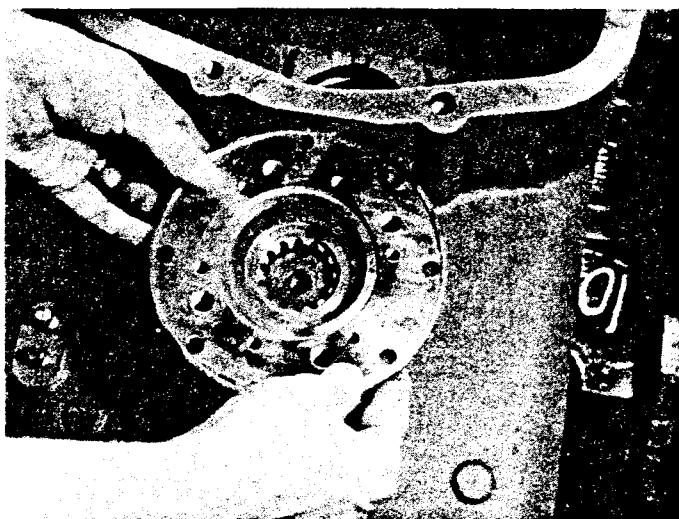


Fig. 290

Install the companion flange.

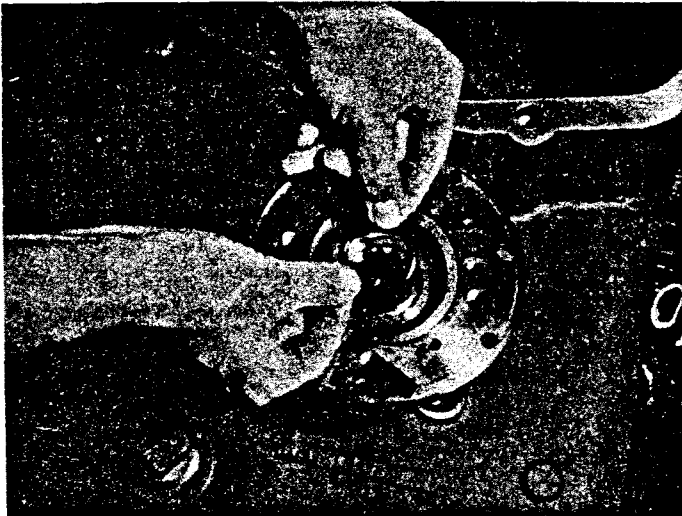


Fig. 291

Install the "O"ring.

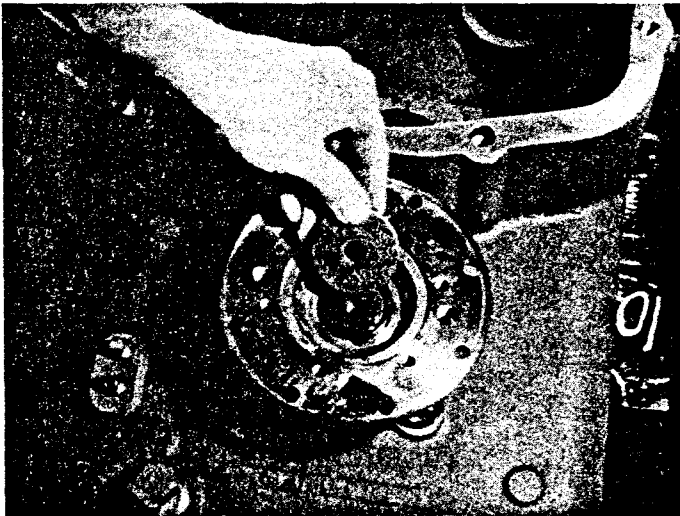


Fig. 292

Install the flat washer.



Fig. 293

Install the place bolt.

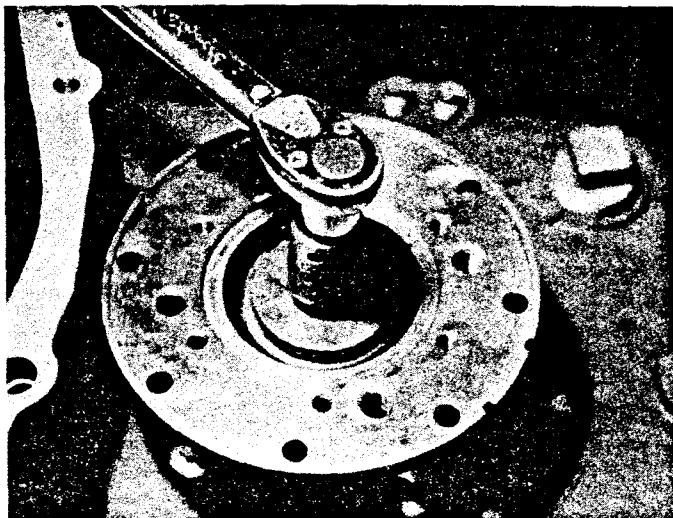


Fig. 294

Torque the place bolt to 85 ft. lbs.



Fig. 295

Turn the case over.

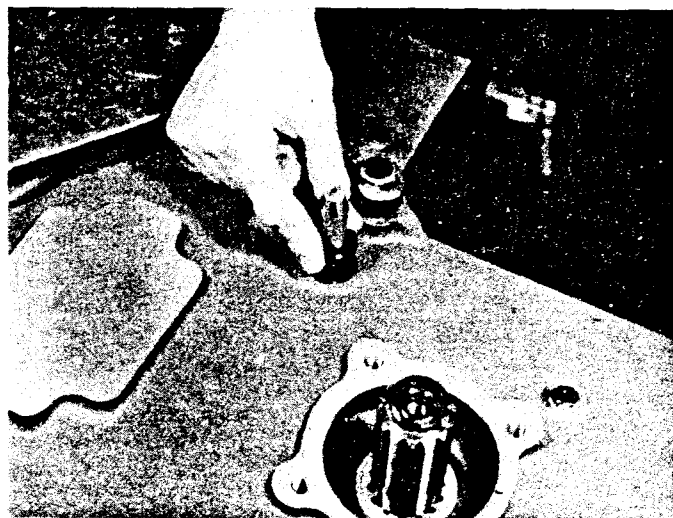


Fig. 296

Install the shifter shaft oil seal,

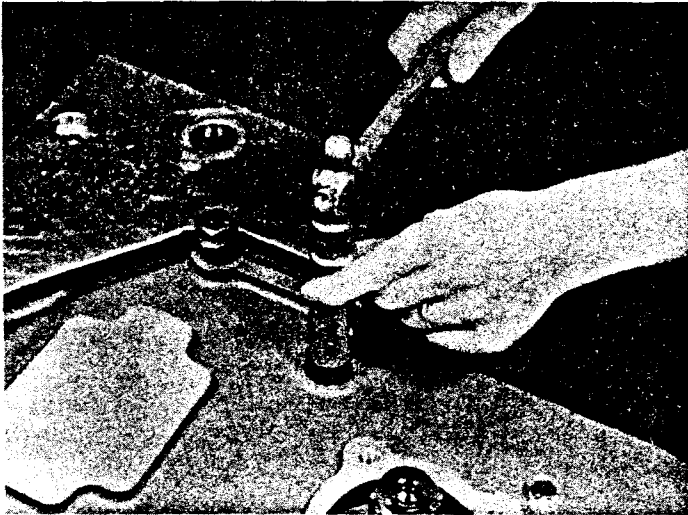


Fig. 297

Use a seal driver and drive the oil seal in as shown.

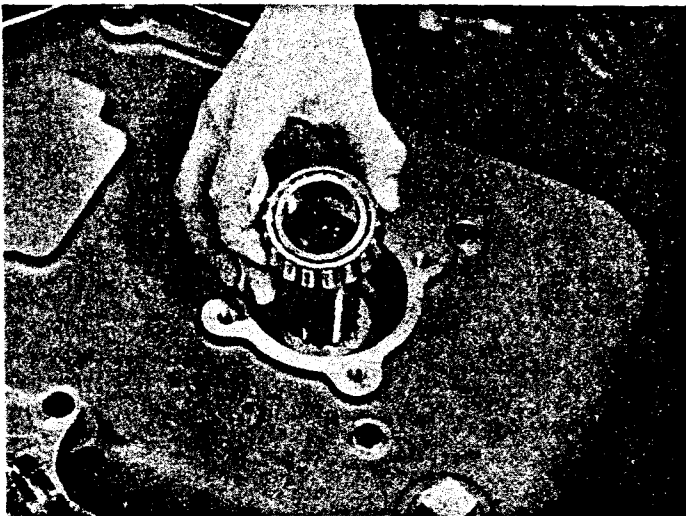


Fig. 298

Install the bearing on the shaft.

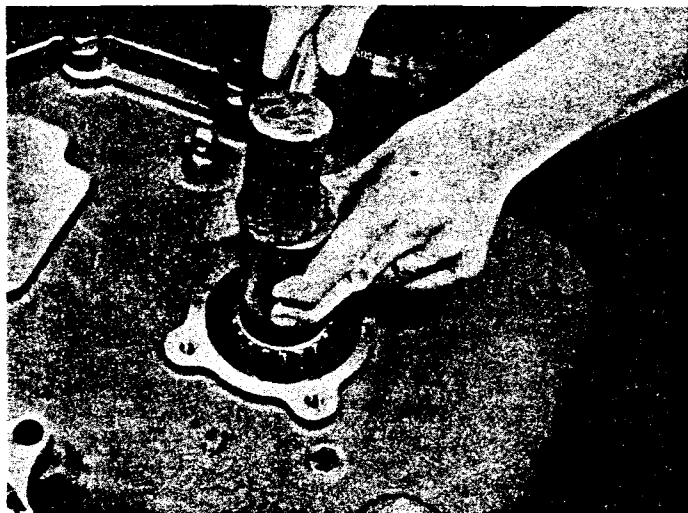


Fig. 299

Drive the bearing on the shaft as shown.

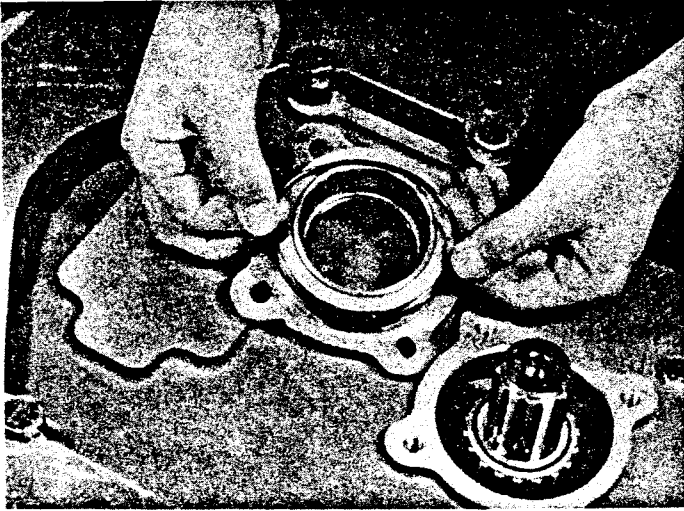


Fig. 300

Install the bearing cup and the retainer "O"ring.

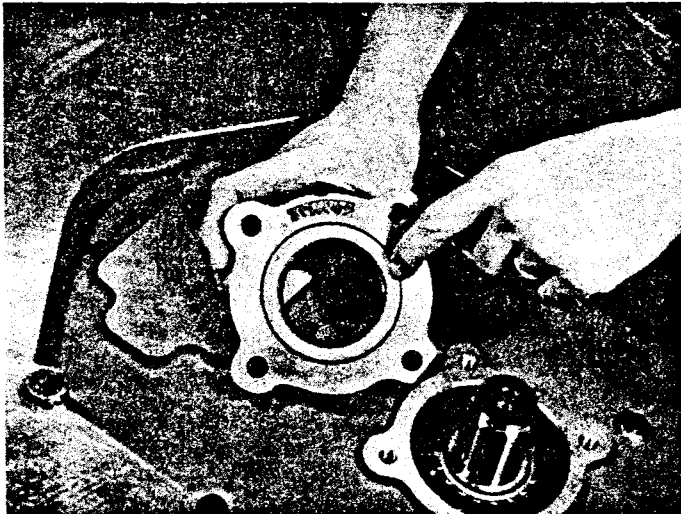


Fig. 301

Install the oil seal in the bearing retainer. Refer to figure 286.

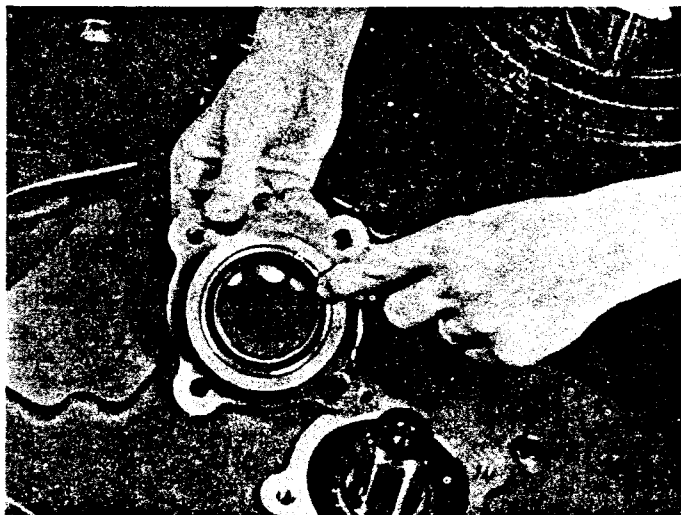


Fig. 302

The oil seal must be installed with the lip as shown.

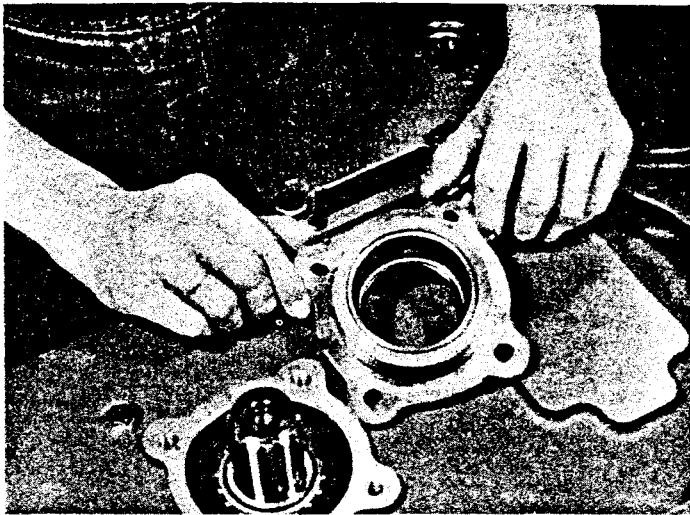


Fig 303.

Install between .035 to .040 shims as a starting point for the bearing adjustment.

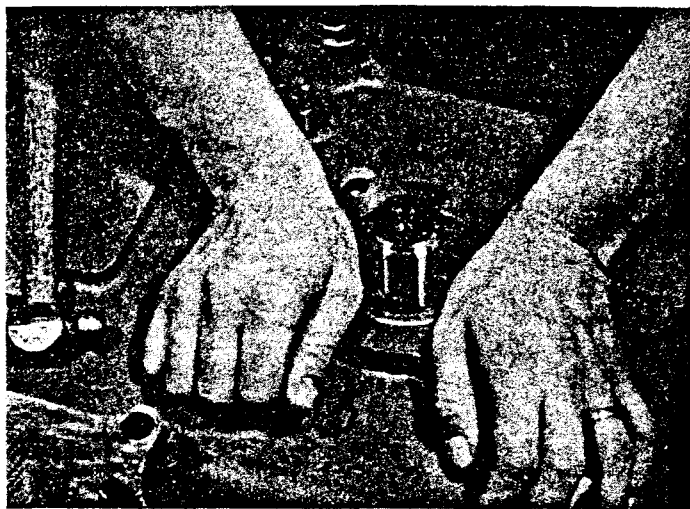


Fig. 304

Install the bearing retainer, shims and capscrews.

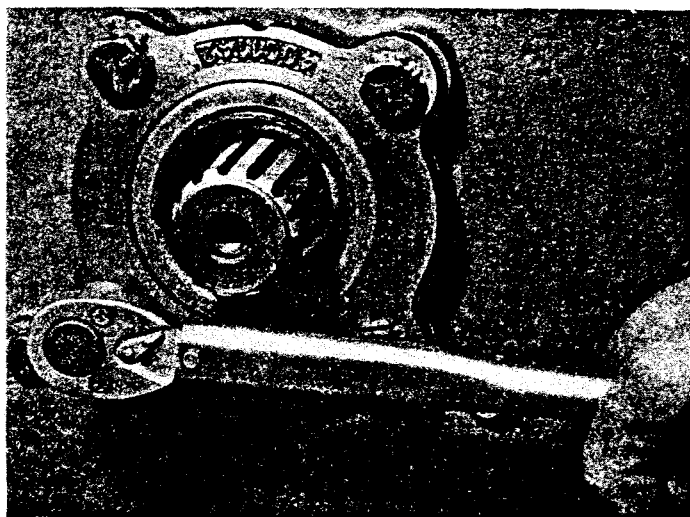


Fig. 305

Install the capscrews and torque to 75 ft. lbs. Refer to figure 288.

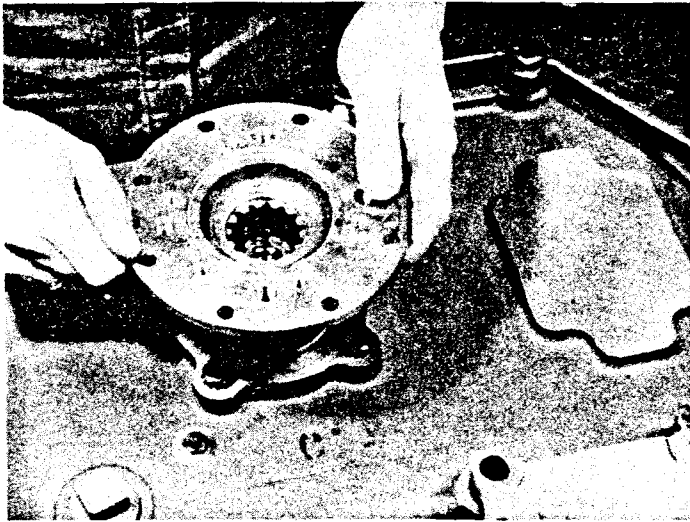


Fig. 306

Install the companion flange.

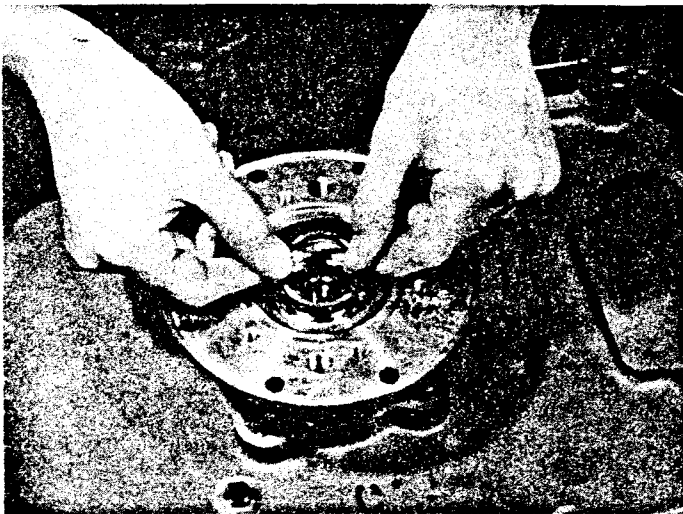


Fig. 307

Install the "O"ring.

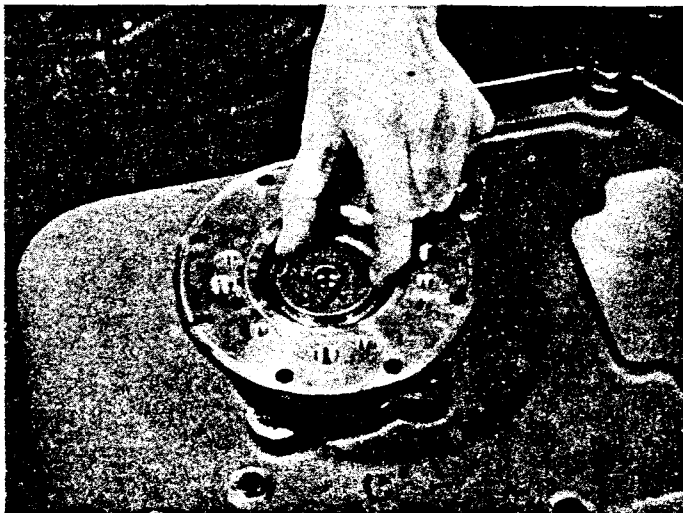


Fig. 308

Install the flat washer.



Fig. 309

Install the place bolt and torque to 85 ft. lbs.

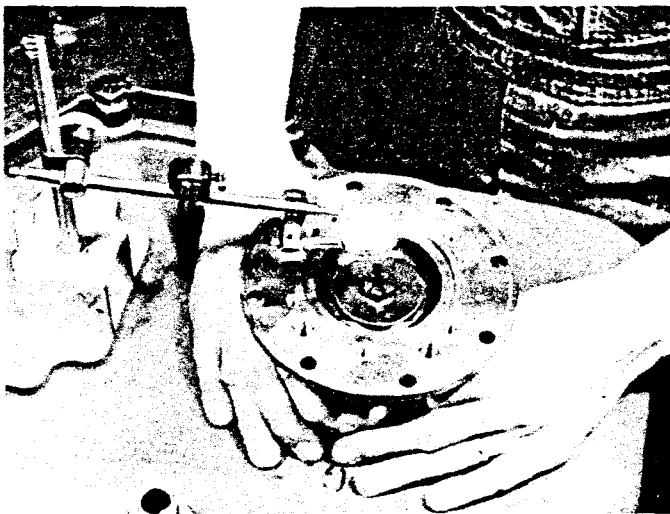


Fig. 310

Use a dial indicator to check the shaft for .003 to .005 end play, by pulling up on the companion flange by hand.

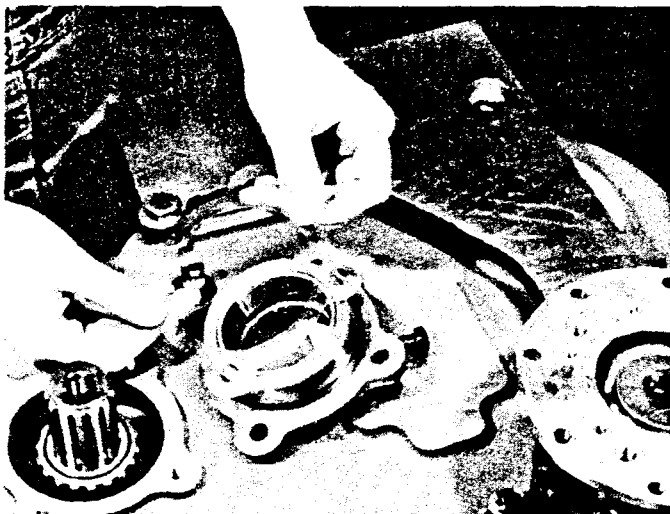


Fig. 311

If the end play reading is correct, remove the companion flange bearing retainer and add or subtract until required shim setting is obtained. After shim thickness is obtained for proper end play setting, follow steps as outlined in figures 306 thru 309.



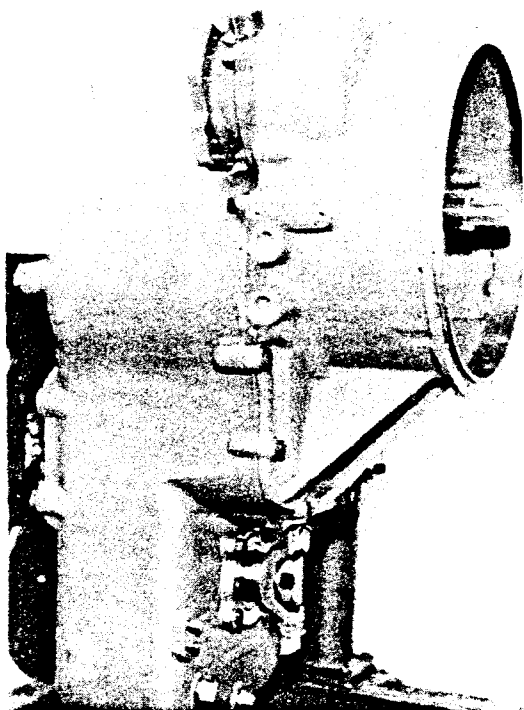


Fig. 312

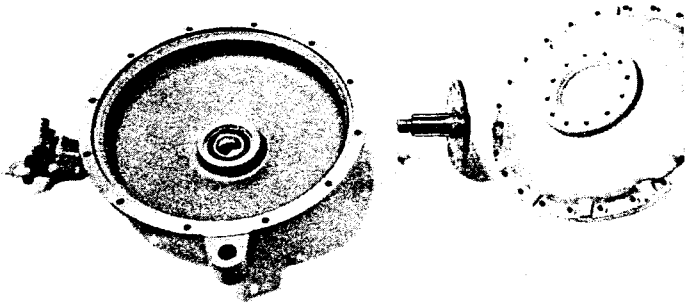
This is the complete assembled  
18 5/8 long drop transmission.



Fig 313

This shows the transmission vent  
location located on the right side  
above the heat exchanger ports.

Fig. 314



These are the component parts used for the midship mounted transmission. The 11 3/4 " or the 12 3/4" converter can be used. The difference from the standard converter is the front cover.

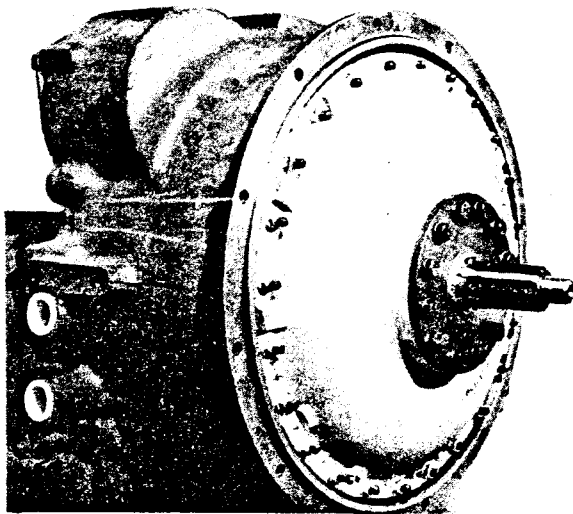


Fig. 315

This is the midship mounted converter installed on the unit.

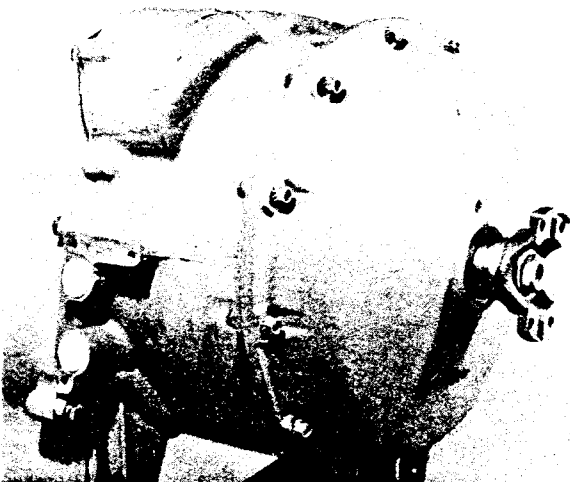


Fig. 316

This is the complete assembled midship mounted front cover assembly.

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