

SECTION 2-G

ENGINE MOUNTING ADJUSTMENT, FLYWHEEL REPLACEMENT, ENGINE BALANCING

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2-25 ENGINE MOUNTING ADJUSTMENT

The engine and transmission when properly aligned with the frame of the car, must rest in a normal position which does not impose any shear strain on any of the rubber mounting pads. The following procedure should be used when tightening mounts to obtain proper adjustment. Prior to adjusting the engine mounts, disconnect the exhaust pipes from the exhaust manifolds and loosen the front muffler joints.

a. Variable Pitch Dynaflow and SM Engine Mount Adjustments

1. Make sure that transmission support to frame shims are in original position and that support to frame bolts are tight. Make sure that bolts holding thrust bracket to rear bearing retainer are tight. See figure 2-41.

2. Before tightening any other mounting bolts, check position of transmission thrust bracket; if it is tight against its thrust pad, engine and transmission fore-and-aft location is perfect and all other mounting bolts can be tightened.

3. However, if there is a gap between the thrust bracket and its pad, proceed as follows:

(a) Loosen 4 bolts holding engine mounts to frame.

(b) Tighten 3 nuts holding thrust bracket to its pad. This will impose a forward strain on engine mounts.

(c) Raise engine slightly to allow engine mounts to normalize. Then lower engine.

4. Tighten 2 nuts holding transmission mounting pad to support.

5. Tighten engine mounts to engine and to frame.

6. Reassemble the exhaust system, making sure that pipes are centered in the frame mem-

ber holes and that the system is free from binds.

NOTE: When installing an engine or an engine-transmission assembly, the front engine mounting pad to frame bolts should be the last mounting bolts to be tightened.

b. Flight Pitch Dynaflow Engine Mount Adjustments

1. Make sure that all bolts from the transmission pads to transmission case are tight.

2. Be sure all transmission support to frame shims are in their original positions, and all support to frame bolts are securely tightened.

3. Lower transmission onto support and note if the rear face of the transmission support is in close contact with the corresponding face on the mounts.

(a) If so, insert the four thrust bolts and tighten securely.

(b) Install nuts and hole reinforcements on two support studs and tighten securely.

4. If the rear face of the transmission support and the corresponding face of the pads are *not* in close contact, loosen four front engine pads to frame bolts.

(a) Install the four transmission support to mount bolts and tighten securely drawing these surfaces together.

(b) Lift front of engine slightly to allow engine mounts to normalize, and lower carefully so one mounting is not compressed more than the other.

5. Install nuts and hole reinforcements on two transmission support studs and tighten securely.

6. Tighten engine mounts to engine and frame.

7. Reassemble the exhaust system, making sure that pipes are centered in frame member holes and that the system is free from binds.

NOTE: When installing an engine and transmission assembly, the front engine mounting pad to frame bolts should be tightened last.

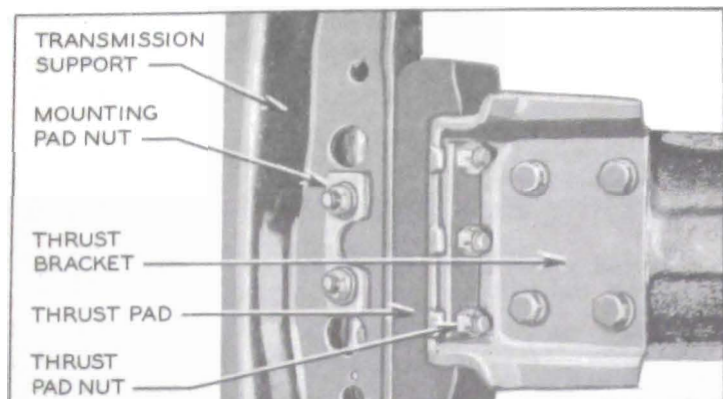


Figure 2-41—Synchromesh and Variable Pitch Dynaflow Transmission Mounting—Bottom View

2-26 FLYWHEEL REPLACEMENT

a. Replace Flywheel and Check Run-out on Dynaflow Engine

1. Remove the Dynaflow transmission then remove the flywheel from the crankshaft flange.

2. Inspect flywheel. If flywheel is cracked at crankshaft bolt holes, replace flywheel.

3. Check for burrs around drilled holes in crankshaft flange and face of flywheel to be installed; remove any burrs with a mill file, then install flywheel and tighten bolts evenly to 50-55 ft. lbs. torque.

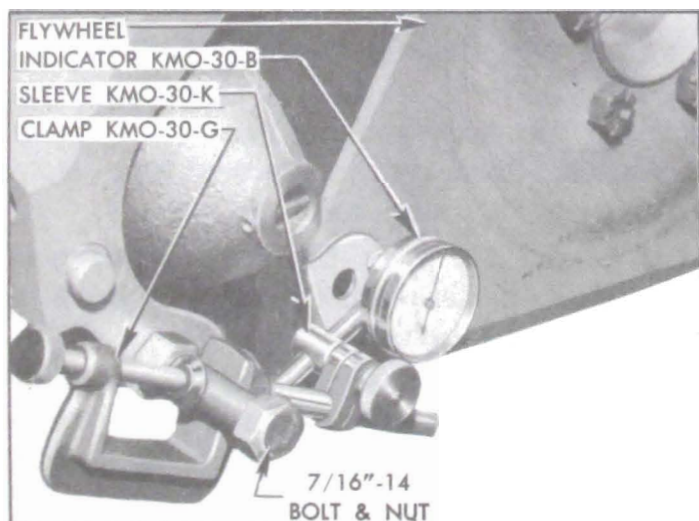


Figure 2-42—Checking Run-Out of Dynaflow Flywheel

4. Mount Dial Indicator KMO-30-B with Sleeve KMO-30-K and clamp KMO-30-G as shown in figure 2-42, so that stem of indicator bears against the flat surface of flywheel at inner side of the bolt holes.

5. Turn flywheel, making sure that crank-

shaft end thrust is held in one direction, and note run-out of flywheel face. Run-out should not exceed .015".

6. If run-out exceeds .015" attempt to correct by tapping high side of flywheel with mallet. If this does not correct run-out remove flywheel and check for burrs between flywheel and face of crankshaft flange. Remove burrs and recheck for run-out.

7. If no burrs exist install a new flywheel and recheck run-out. If run-out still exceeds .015" check run-out of rear face of crankshaft flange.

8. After installation of transmission, test for engine vibration. If vibration has been introduced by installation of new flywheel make correction as described in paragraph 2-27.

b. Replace Flywheel or Ring on Synchromesh Engine

1. Remove transmission and clutch assembly, being sure to mark clutch cover and flywheel so that the assembly can be reinstalled in its original position.

2. Remove flywheel, which is located in a definite position on the crankshaft flange by means of one dowel.

3. If the flywheel ring is to be replaced, drill a $\frac{5}{16}$ " hole in the ring between two teeth and split the ring at this point with a cold chisel. Heat and shrink the new ring in place as follows:

(a) Polish several spots on the ring with emery cloth.

(b) Use a hot plate or a slowly moving torch to uniformly heat the ring until the polished spots turn blue (approximately 600° F.).

CAUTION: Heating the ring in excess of 800 deg. F. will destroy the heat treatment given during manufacture.

(c) Quickly place ring in position against shoulder on flywheel, with beveled end of teeth away from shoulder, then allow ring to cool slowly until it is tight in place.

4. Make certain that the flywheel and the crankshaft flange are clean and free of burrs that would cause run-out, then install flywheel.

5. After installation of clutch and transmission test engine for vibration. If engine has vibration that did not exist before installation of new parts, make correction as described in paragraph 2-27.

2-27 CORRECTION OF UNBALANCED ENGINE

Individual crankshafts, flywheels, and other rotating parts are dynamically balanced to very close limits in production. Completely assembled engines are also given a running test and balanced to very close limits by drilling the flywheel or by adjusting converter balance weights as required. For this reason, a converter pump should always be marked so that it can be reinstalled in its original position on the flywheel.

Some cases of excessive vibration may result from replacement of rotating parts. An extremely unbalanced condition should always be corrected by replacing parts which are abnormally out of balance or materially different in weight from corresponding parts. The following procedures are intended only for correction of minor cases of unbalance which may occur when individually balanced parts are replaced.

a. Critical Speed of Vibration

Determine the engine speed at which the vibration is most pronounced, so that test at this critical speed may be made after corrective work is done.

1. Place car solidly on stands high enough to permit working underneath.

2. Connect a tachometer to engine. Start engine and with transmission control lever in Parking position increase speed gradually until a point is reached where the objectionable vibration is definite. Note engine RPM at this critical speed, then stop engine.

b. Correction of Unbalanced Dynaflo Engine

1. Remove bell housing cover.

2. Install one balance weight No. 1178109 (.060" thick) under the head of two converter pump cover bolts, and tighten bolts to 25-30 ft. lbs. torque.

NOTE: Do not place a weight at a flywheel to converter driving bolt because these bolts are not long enough for addition of weights.

3. Run engine at critical speed and carefully compare vibration with that obtained without the weight, then stop engine.

4. Mark location of balance weight on converter pump, remove weight and tighten bolt to 25-30 ft. lbs. torque.

5. Install the balance weight at other con-

verter pump cover bolts and compare the vibration produced at critical speed.

6. At the point where the balance weight produced the greatest improvement in vibration install weights of proper thickness to eliminate objectionable vibration. Balance weights are available under Group 4.115 in several different thicknesses.

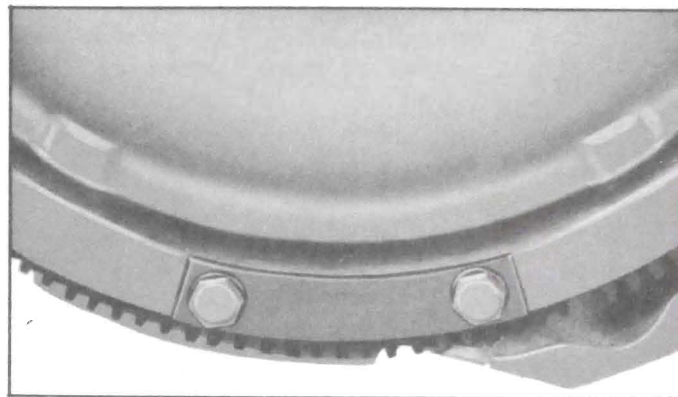


Figure 2-43—Installation of Balance Weight

NOTE: When factory balancing of converter pump is changed to balance an engine, the pump cannot be used with any other engine.

7. Install bell housing cover. Remove tachometer and car stands.

c. Correction of Unbalanced Synchronesh Engine

If the vibration developed after removal and installation of clutch assembly, check all clutch cover bolts to make sure they are of same length and that each has one lock washer. Also check marks that were made when clutch was removed and disassembled to make sure that clutch was assembled and installed according to these marks. Make any corrections indicated by this inspection and run engine at the critical speed to check results.

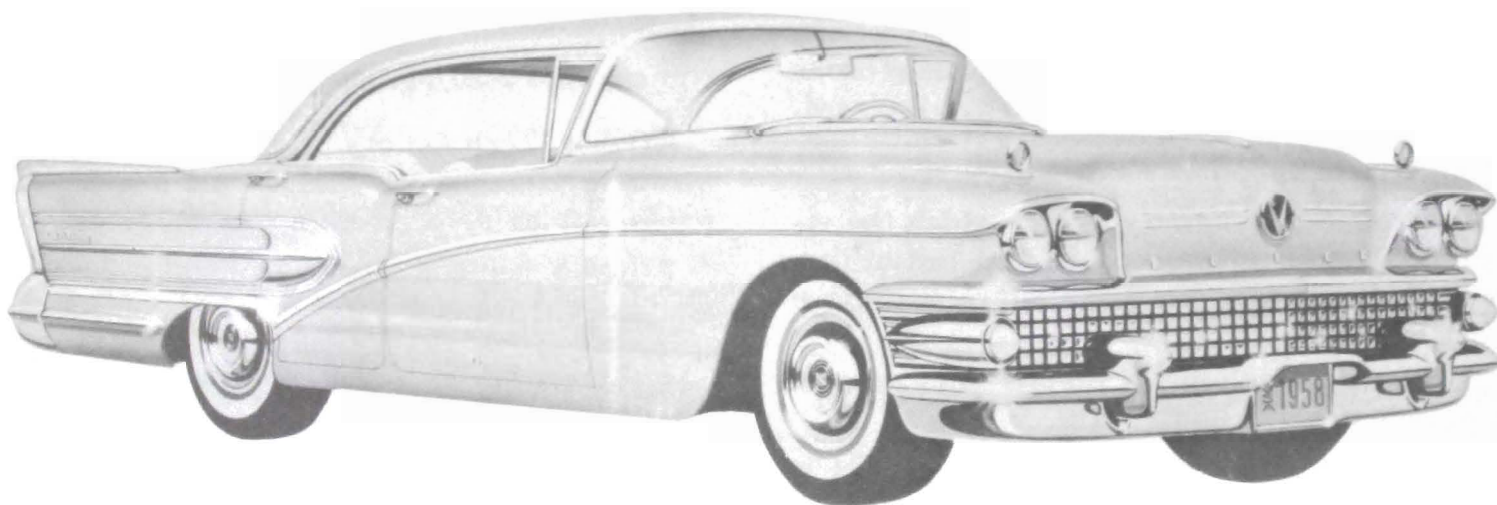
If clutch assembly and installation does not appear to be at fault, mark clutch cover and flywheel and remove clutch assembly. Run engine at critical speed and check for vibration. If vibration is eliminated, the clutch is at fault and should be balanced as described below. If vibration still exists, however, it will be necessary to balance the flywheel on the crankshaft.

To balance the flywheel, insert one clutch cover bolt successively in each hole in flywheel and check results at each position by running the engine. It may be necessary to vary the test weight by adding washers or by using a shorter bolt. When a proper weight and position has

been found to eliminate the vibration, the bolt will be on the light side of flywheel. Remove the bolt and drill shallow holes in diametrically opposite side of flywheel, until enough weight has been removed to make engine run smooth. Use a $\frac{3}{8}$ " drill and do not drill any hole more than $\frac{1}{4}$ " deep.

After making sure that engine runs smooth with clutch removed, install clutch assembly

according to marks made before removal and again check for vibration at the critical speed. If vibration exists with clutch installed, install one plain washer under the lock washer of each clutch cover bolt in turn until a location is found where the engine runs smooth. It may be necessary to place plain washers on two adjacent bolts in order to obtain enough weight at the proper location to secure balance.



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