

ORDNANCE MAINTENANCE -- POWER TRAINS AND INTERCHANGES:
MILITARY/ CIVILIAN TRUCKS 1941 TO 1971 (DODGE)

2) Input flanges.

- a) Early "Detroit" type -- used on 3/4-ton WC, 1-1/2-ton WC, M601, PW series trucks
- b) Square four-bolt pattern -- used on M37 series trucks
- c) Civilian "Detroit" type -- not used on military trucks

3) Locking differentials. In WWII, 6x6 Dodges were having problems getting traction in the heavy mud of several European theaters. The military ordered about 500 "Detroit Lockers" (model KS-22A) from the Detroit Automotive Company to alleviate these problems. They can be identified by the large springs inside the differential carrier, and were designed for use only on the rear wheels. These units have not been available from the company for years, and most of their prints and records on it were destroyed by fire.

5.3 INTERCHANGEABILITY

a) 8-3/4 third members in 8-3/4 housings. All of these third members are interchangeable between the various trucks using them, provided that the differential case and side gears match the axle shaft splines and the axle housings have not been modified as explained in paragraph 6.1 (c) (spacer ring welded on). Also, items 2,3,4,6,8,9 in table 5-1 are third members with 7/16 (instead of 3/8) mounting holes. These complete units will fit right in, but the studs should be modified as explained in paragraph 5.3 (c) below.

b) 8-3/4 third members in 9-5/8 housings. 8-3/4 third members should not be used in 9-5/8 rear housings that use only one gasket (modified 3/4-ton WC, 1-1/2-ton WC, M, PW series trucks) without modifying the differential carrier as explained in 1) below and then doing items 2) through 6). This is because the axle centerline of the 8-3/4 unit is 1/16 closer to the mounting surface than is the centerline of the original 9-5/8 unit (see paragraph 6.1 (c)). If such an installation is made, the spline end of the axle will be pulled off-axis by 1/16 and it will flex as it rotates, producing stress where it joins the flange.

8-3/4 third members can be used in 9-5/8 front housings because the 1/16 offset is compensated for by clearances in the splines and inner axle shaft bushing and by the steering knuckle U-joint.

THIRD MEMBERS

8-3/4 third members can be used in 9-5/8 housings that normally use three gaskets (middle production 3/4-ton WC series trucks) by doing **only** items 2) through 6) below.

Also remember that the 8-3/4 gears are weaker than 9-5/8 gears and break more easily.

1) **Differential carrier.** The carrier should be modified by machining 1/16 off of the mounting surface. This will then allow the axle centerline to be moved 1/16 further in to match the original 9-5/8 location.

2) **Stud holes.** the 3/8 stud holes must be drilled out to 7/16 to match the 9-5/8 housing 7/16 studs.

3) **Input flange.** All of the input flanges are interchangeable. Simply change to the one that is required for the drive shaft involved.

4) **Differential case.** The axle shaft holes in the case and cap are smaller in the 1/2-ton truck unit than in the 3/4-ton unit. Thus, a 3/4-ton axle will not fit into a 1/2-ton case, but a 1/2-ton axle will fit into a 3/4-ton case. The correct case must therefore be selected.

5) **Differential side gears.** Side gears are interchangeable between 1/2-ton truck and 3/4-ton truck cases, and must match the axle shafts involved. Rather than change the side gears, however, an easier method is to change the whole differential case assembly and install the ring and pinion gears desired. Remember, though, that the two-pinion case is weaker than the four-pinion case and plan accordingly.

6) **Gasket.** Use only one third member mounting gasket.

c) 9-5/8 third members in 8-3/4 housings.

1) **Studs.** For additional strength and to prevent movement, the axle housing stud diameter should be 7/16 (instead of 3/8) when using a 9-5/8 third member. Rather than drill out and re-tap the holes, the problem can be solved by having special stepped studs made, 3/8-16 x 3/8 on one end and 7/16-20 x 1-1/4 on the other end. They should be hardened to grade 8 for additional strength, and will cost about \$3 each. This sounds expensive, but is much better than ruining the axle housing. Remember, the studs must be pointing **exactly** 90° out from the ring surface, and a fixture is needed to do this properly.

2) **Cover.** The 8-3/4 axle housing cover will interfere with the 9-5/8 ring gear. The easiest solution is to use a bolt-on 9-5/8 cover from a 3/4-ton or 1-1/2-ton WC series truck (they are directly inter-