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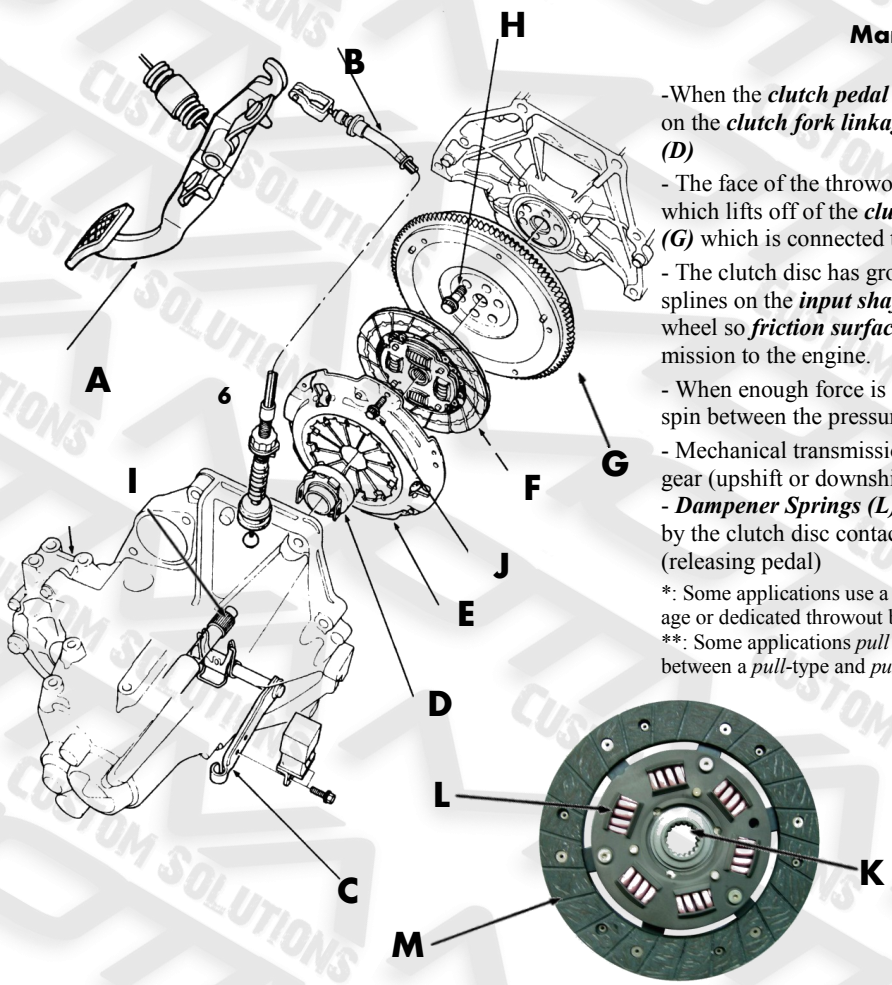


Manual Transmission Clutch Operation

-When the ***clutch pedal (A)*** is pressed it pulls on the ***clutch cable* (B)*** which pulls back on the ***clutch fork linkage* (C)*** the end of which is connected to the ***throwout bearing* (D)***

- The face of the throwout bearing presses on the fingers of the ***pressure plate** (E)*** which lifts off of the ***clutch disc (F)*** located between the pressure plate and the ***flywheel (G)*** which is connected to the engine crankshaft by ***flywheel bolts (H)***

- The clutch disc has grooves or ***"splines" (K)*** in the center that interface with the splines on the ***input shaft (I)*** of the transmission. The pressure plate is bolted to the flywheel so ***friction surface (M)*** of the clutch disc is the only direct connection of the transmission to the engine.

- When enough force is applied to the pressure plate to allow the clutch disc to freely spin between the pressure plate and flywheel the clutch is considered **disengaged**

- Mechanical transmissions require the clutch to be disengaged in order to select a new gear (upshift or downshift)

- ***Dampener Springs (L)*** in the center of the clutch disc absorb harsh vibrations created by the clutch disc contacting the pressure plate and flywheel during **engagement** (releasing pedal)

*: Some applications use a hydraulic pressure system (similar to a brake system) to actuate the linkage or dedicated throwout bearing assembly *fig 2*

**: Some applications *pull* on the fingers instead of pressing. This is the defining characteristic between a *pull*-type and *push*-type clutch assembly.

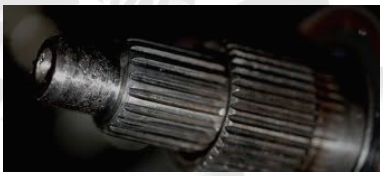
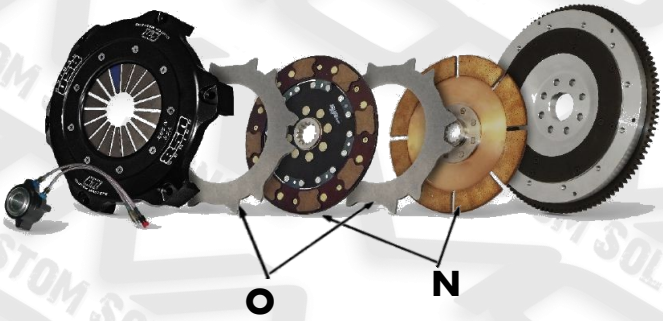


Fig 1: Splines on the input shaft

Fig 2: A Hydraulic Throw-Out Bearing Assembly: The hydraulic actuator replaces the clutch fork assembly



- A ***twin or multi-disc clutch (N)*** has ***multiple clutch discs*** that are separated by ***floaters (O)***. These floaters allow the clutch discs free motion when the clutch is engaged. In this state the discs and floaters "click and clank" as they loosely touch each other with no clamping force. This noise is normal and should dissipate when the clutch is re-engaged.

- A multi-disc clutch assembly increases the friction surface are to improve holding capability. By increasing the surface area instead of just the clamping force a twin or multi-disc clutch will require less pedal effort compared a single disc version with equivalent holding capability,

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