

SETTING UP YOUR RAM CLUTCH USING FACTORY HYDRAULICS

These vehicles utilize a concentric hydraulic slave/release bearing that mounts on the front of the transmission to actuate the clutch system. It is imperative that you understand how these systems work when installing a replacement or aftermarket clutch system.

The factory concentric slave utilizes a spring to keep the bearing positioned constantly on the clutch release fingers. When the transmission is removed the spring will push the bearing out further to the maximum extended position. The distance from the bearing when it is contacting the clutch fingers to the fully extended position described above is typically .500-.600 inches. This distance can be described as 'preload' and is the main factor in setting up the factory concentric slave with an aftermarket clutch system. The bearing can only achieve forward movement equal to the amount of preload. .500" can be considered the minimum amount for your install. **TAKING THE EXTRA 10 MINUTES NOW TO MEASURE MAY SAVE YOU HOURS OF WORK!**

Below is the most common method for determining fit.

TOOLS REQUIRED

6 inch vernier dial calipers and a metal straightedge

BEARING TOTAL AVAILABLE TRAVEL

Measurements 'B' and 'D' on the setup diagram will determine total travel of the slave/bearing. Attach the bellhousing to the transmission if is not already. Measurement 'B' is the compressed bearing height. Push the bearing all the way back on the slave to take this measurement. Allow the bearing to return to its free height to measure dimension 'D'. Subtracting measurement 'D' from measurement 'B' will tell you the total travel of the slave/bearing. **WHY IS THIS IMPORTANT?** When the clutch is installed, we want to have adequate preload for the clutch to disengage (minimum .500"), yet enough remaining distance to allow the clutch fingers to move out as the unit wears (minimum .175 for single disc clutches, minimum .200" for dual disc clutches). Additionally, dimension 'D' will be used later to determine the preload on the clutch fingers.

EXAMPLE: $B (3.850") - D (2.860") = \text{AVAILABLE TRAVEL } (.990")$

TOTAL CLUTCH HEIGHT

Total clutch height is the first important component to determine bearing/slave preload. First we must determine the crank flange protrusion from the back of the block, or bellhousing

mounting surface. *It is critical to have any block or engine plates in place when you take this measurement, as this will affect the overall computation.* This is dimension 'A' on the setup drawing. Measure from the face of the crank flange to the block or engine plate.

The clutch height (Dimension 'C') is measured by bolting the entire assembly to the flywheel, just like it will be installed in the vehicle.

EXAMPLE: $A (.250") + C (.3.150") = \text{TOTAL CLUTCH HEIGHT } (3.400")$

LAST STEP: DETERMINING THE PRELOAD OF THE SLAVE/BEARING

Now we have the info we need to determine the preload. By subtracting the bellhousing face to slave/bearing measurement uncompressed (Dimension 'D') from the clutch height measurement determined above ('A' + 'C'), the preload can be determined.

EXAMPLE: $\text{CLUTCH HEIGHT } (A+C) (3.400") - D (2.860") = -.540" \text{ PRELOAD}$

Since this number meets our requirement of minimum .500 preload, we are exactly where we need to be and this install can be completed.

IF the preload number is under .500", a shim behind the bearing/slave will be required to achieve the proper preload.

EXAMPLE: If the dimension 'D' number is 2.960"

$\text{CLUTCH HEIGHT } (A + C) (3.400") - D (2.960") = .440"$

In this case, a .100" shim is required behind the bearing slave to increase the preload to the minimum .500" number.

IF the preload number does not allow for the minimum extra clearance for clutch wear, changing to an aftermarket slave cylinder will be required.

EXAMPLE: If the dimension 'D' number is 2.450"

$\text{CLUTCH HEIGHT } (A+C) (3.400") - D (2.450") = .950" \text{ PRELOAD}$

Since we know from our initial measurement that the total travel available for the slave/bearing is .990", this preload number only allows for a maximum of .040" wear before the bearing is bottomed out on the slave. This is not adequate room for the clutch to wear based on our spec of .175" (single disc) or .200" (dual disc clutch).

FITTING YOUR NEW CLUTCH WITH A FACTORY INTERNAL SLAVE/BEARING

TWO EASY STEPS TO SUCCESS

1. Determine the space required for the clutch system

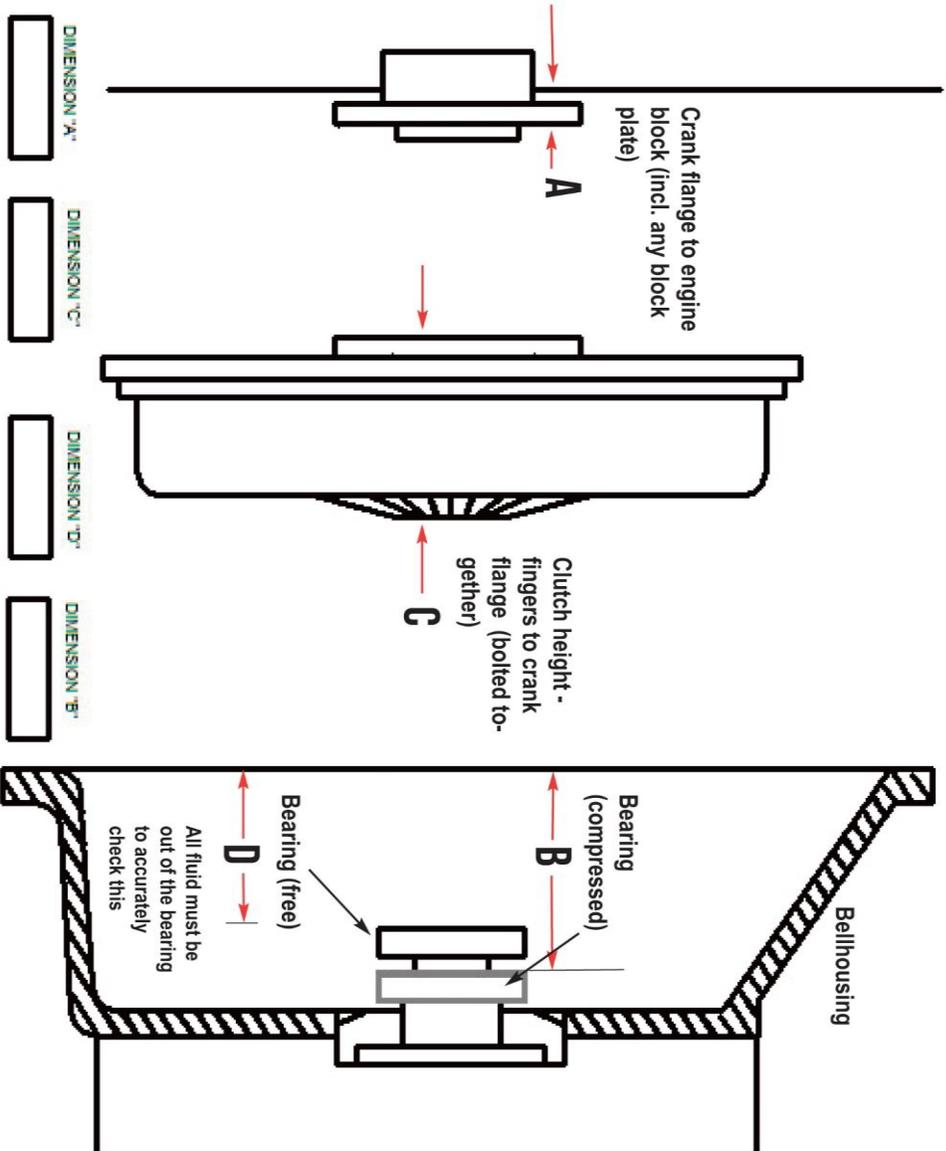
- Measure and record in boxes 'A' and 'C', then 'B' and 'D'.
- Add dimensions 'A' + 'C'. This sum is the clutch installed height.
- Subtract the clutch installed height 'A + C' from the bearing compressed height 'B'. This result is the bearing clearance available, or, remaining room for wear.

THE MINIMUM RECOMMENDED CLEARANCE IS .200" TO ALLOW FOR CLUTCH WEAR. IF CLEARANCE IS LESS THAN .200", A RAM SLAVE MAY BE REQUIRED FOR PROPER FIT.

2. Establish the correct bearing preload

- Subtract dimension 'D' bearing free from total clutch installed height 'A+C'. The result is the bearing preload.

THE MINIMUM PRELOAD IS .700". IF PRELOAD IS LESS THAN .700", AN APPROPRIATE SIZED SLAVE SPACER SHIM MUST BE USED TO ACHIEVE THE MINIMUM PRELOAD.



B	<input type="text"/>	A + C	<input type="text"/>	=	<input type="text"/>	CLEARANCE
	Bearing compressed		Total clutch inst. height			
A + C	<input type="text"/>	-	D	<input type="text"/>	=	<input type="text"/>
	Total clutch inst. height		Bearing free			PRELOAD

A VIDEO GUIDE TO COMPLETING THIS PROCEDURE IS AVAILABLE AT https://youtu.be/o-rKqvrb_o9