No.: 14 TL-7Rev
April 10, 2015

TO: Service Locations

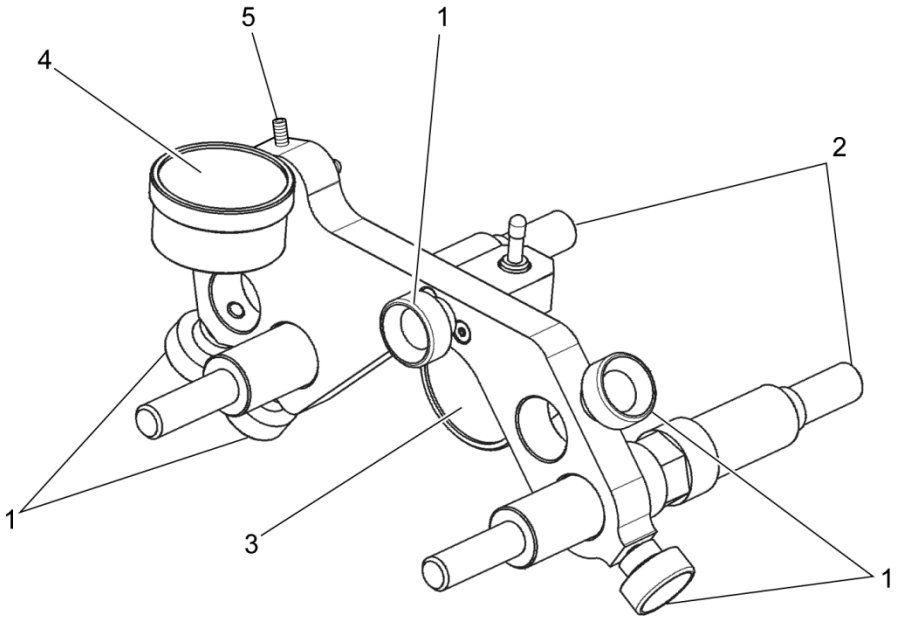
FROM: Service Systems Development

SUBJECT: **DD Platform Flywheel Housing Runout Tool W470589032100**

GENERAL INFORMATION

The Detroit™ special tool group has developed a runout tool to measure the bore and rear flatness on the flywheel housing. The tool is compatible with most manual transmission flywheels as well as the flywheel used for the Detroit™ DT12™ transmission.

TOOL USAGE INSTRUCTIONS



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1. Tightening knobs
2. Fixture mounts
3. Bore runout dial indicator
4. Flatness runout dial indicator
5. Pin Screw (MUST be used to secure flatness dial indicator)

WARNING: **PERSONAL INJURY**
To avoid injury from hot surfaces, wear protective gloves, or allow engine to cool before removing any component.

Figure 1. Flywheel Housing Runout Tool

In order to measure the runout, refer to OEM instructions for the removal of the vehicle's transmission.

To record the measurements and determine if the runout calculations are correct, log into DDCSN.com. Use the link below:

https://extranet-ddc.freightliner.com/FlywheelHousingRunoutCalculator/

Bore Runout is recorded in figure 3, Face Runout is recorded in figure 4.

Install and measure the flywheel housing runout as follows:

1. Install the engine barring tool (P/N: J-46392 or W904589046300).
2. Install the fixture mounts at the six o'clock position into the flywheel by matching the respective threads.
3. Install the fixture to the mounts; hand-tighten the knobs.

Note: When installing the dial indicators, ensure the measurement stems are not bottomed out.

4. Install the bore dial indicator onto the fixture; hand-tighten the knobs.
5. Adjust the dial indicator to read zero.
6. Rotate the engine until the dial indicator reaches the 3 o'clock position.
    a. Enter the value for the bore runout in the "A" box.
7. Rotate the engine until the dial indicator reaches the 12 o'clock position.
    a. Enter the value for the bore runout in the "B" box.
8. Rotate the engine until the dial indicator reaches the 9 o'clock position.
    a. Enter the value for the bore runout in the "C" box.

Note: If the dial indicator does not read zero, reinstall the indicator and measure the entire flywheel housing bore again.

9. Rotate the engine until the dial indicator reaches the 6 o'clock position. Ensure dial indicator reads zero.
10. Rotate the engine until the dial indicator reaches the 12 o'clock position.
11. Adjust the dial indicator to read zero.

12. Using a pry bar, apply upwards pressure on the bottom of the flywheel against the inside of the flywheel housing. See Figure 2.

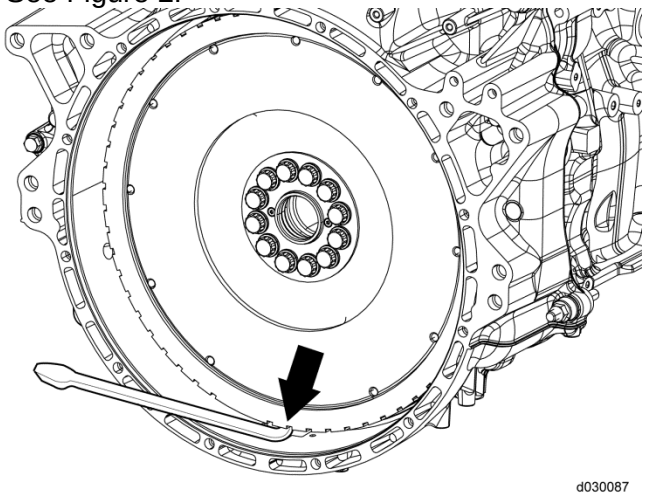

Figure 2. Using Pry Bar on the Flywheel Housing

13. While pressure is applied on the flywheel, record the reading on the dial indicator in the "D" box.
14. Remove the pry bar and ensure the dial indicator reading returns to zero.

Total Bore runout will auto populate in box "E".

Bore Runout		
Set Measurement at 6 O'Clock to 0	0	
Measurement at 3 O'Clock*		A
Measurement at 12 O'Clock*		B
Measurement at 9 O'Clock*		C
Measurement at 6 O'Clock again, (make sure it is still 0)	0	
Set Measurement at 12 O'Clock to 0	0	
Measurement at 12 O'Clock with crankshaft raised to upper limit*		D
Measurement at 12 O'Clock at original position, (make sure it is still 0)	0	
Total Bore Runout	0 — E	

Figure 3. Bore Runout

15. Remove the dial indicator and install it to measure the face runout.
16. Rotate the engine to the 6 o'clock position.
17. Adjust the dial indicator to read zero.
18. Rotate the engine until the dial indicator reaches the 3 o'clock position.
    a. Enter the value for the bore runout in the "F" box.
19. Rotate the engine until the dial indicator reaches the 12 o'clock position.
    a. Enter the value for the bore runout in the "G" box.
20. Rotate the engine until the dial indicator reaches the 9 o'clock position.

a. Enter the value for the bore runout in the “H” box.

Note: The maximum or minimum reading can also be a negative number.

21. Record the maximum indicator reading from steps 18-20 in the “I” box.
22. Record the minimum indicator reading from steps 18-20 in the “J” box.
23. Rotate the engine to the 6 o’clock position. Ensure the dial indicator reading returns to zero.
24. Rotate the engine to the position recorded from step 22.
25. Adjust the dial indicator to read zero.
26. Rotate the engine until the dial indicator reaches the 6 o’clock position.
    a. Enter the value for the bore runout in the “K” box.
27. Rotate the engine until the dial indicator reaches the 3 o’clock position.
    a. Enter the value for the bore runout in the “L” box.
28. Rotate the engine until the dial indicator reaches the 12 o’clock position.
    a. Enter the value for the bore runout in the “M” box.
29. Rotate the engine until the dial indicator reaches the 9 o’clock position.
    a. Enter the value for the bore runout in the “N” box.
30. Record the maximum indicator reading from steps 26-29 in the “P” box.
31. If the reading in box “Q” turns red, conduct the measurements again.

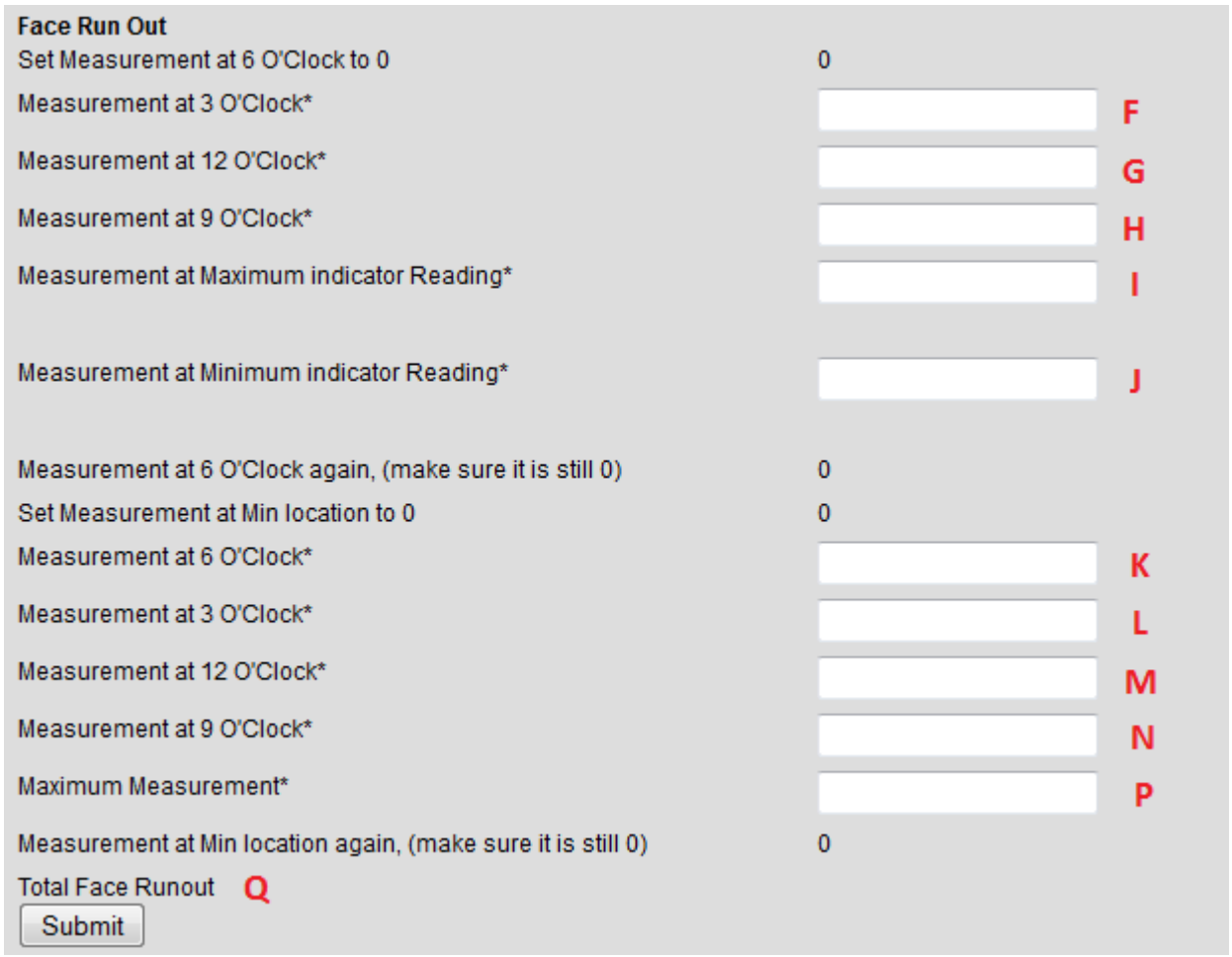

Figure 4. Face Runout

The figure below will auto-populate as the measurements are entered.

Bore Runout Dial Indicator Location	Line #	**6 O'Clock**	**3 O'Clock**	**12 O'Clock**	**9 O'Clock**
Observed Indicator Reading	1	0	0	0	0
Adjustment for Bearing Clearance	2	X	0	0	0
Corrected Readings	3	0	0	0	0
Total Horizontal Runout	4	0			
Resulting Total Bore Runout	5	0			
Face Runout Dial Indicator Location	**Line #**	**6 O'Clock**	**3 O'Clock**	**12 O'Clock**	**9 O'Clock**
Observed Indicator Reading with Dial at '0' at 6 O'Clock	6	0	0	0	0
Observed Indicator Reading at Min and Max location	6	Max	0	Min	0
Observed Indicator Reading with Dial at '0' at 6 Min Location	7	0	0	0	0
Difference to check measurements (All should read True, otherwise repeat)		N/A	N/A	N/A	N/A
Max Face Runout		Calculate		Measure	

Figure 5. Bore and Face Runout Report

The **Maximum** runout allowable on the bore and/or face is .012” to be SAE compliant.

- If the runout exceeds this specification, the flywheel housing must be replaced in order to prevent damage to the pilot bearing, flywheel, or transmission.

CONTACT INFORMATION

Please contact the Detroit™ tool specialist located on DDCSN.com if you have any questions.