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• **Brakes - Availability Of Hub-Mount Brake Rotor Machining Equipment** • **Brake Rotor Machining - Availability Of Hub-Mount Brake Rotor Machining Equipment**	**Article No. 98-5A-5**

FORD:
1993 FESTIVA
1993-94 TEMPO
1993-97 PROBE, THUNDERBIRD
1993-98 CROWN VICTORIA, ESCORT, MUSTANG, TAURUS
1994-97 ASPIRE
1995-98 CONTOUR

LINCOLN-MERCURY:
1993-94 TOPAZ
1993-97 COUGAR
1993-98 CONTINENTAL, GRAND MARQUIS, MARK VIII, SABLE, TOWN CAR, TRACER
1995-98 MYSTIQUE

LIGHT TRUCK:
1993-96 BRONCO
1993-97 AEROSTAR, F SUPER DUTY, F-250 HD, F-350
1993-98 ECONOLINE, EXPLORER, F-150, F-250 LD, RANGER, VILLAGER
1995-98 WINDSTAR
1997-98 EXPEDITION, MOUNTAINEER
1998 NAVIGATOR
1999 SUPER DUTY F SERIES

ISSUE:
Hub-mount brake rotor machining equipment from Rotunda is now approved for warranty and service use. Brake roughness consists of one or more of the following symptoms while braking:

- Steering wheel vibration/nibble
- Seat vibration
- Brake pedal pulsation

Brake roughness is caused by:

- Uneven rotor wear known as Disc Thickness Variation (DTV). DTV is caused by excessive Lateral Run-Out (LRO) or overtorqued wheel lug nuts
- Non-uniform lining transfer

ACTION:
Use Rotunda Hub-Mount Lathe / Pro-Cut (201-00002) to service vehicles with brake roughness. The hub-mount lathe removes DTV, lining transfer, and on-vehicle rotor LRO. The hub-mount lathe has the following advantages over caliper-mount lathes:

- Improved rotor LRO and "dishing" tolerances

- Ability to machine rear rotors on live axles, except for trucks with dual rear wheels
- Easier set-up

Refer to the following Service Procedure for details.

SERVICE PROCEDURE

1. Verify concern.
2. Pre-checks to include:
   - Check OASIS and TSBs for vehicle-specific brake/vibration concerns
   - Visually inspect suspension bushings/ball joints
   - Visually inspect tire conditions and pressure
   - Check wheel bearing end-play
3. Remove wheel/tire.
4. Remove caliper.
5. For vehicles with two-piece hub/rotor:
   a. Mark rotor and wheel stud for proper indexing during reassembly.
   b. Remove rotor.

   NOTE:
   THE ROTOR MUST HAVE SUFFICIENT THICKNESS AFTER MACHINING TO BE OVER THE MINIMUM THICKNESS SPECIFICATION CAST IN THE ROTOR. OTHERWISE, THE ROTOR SHOULD BE REPLACED. DO NOT MACHINE NEW ROTORS, PERFORM THE REMAINING STEPS EXCEPT FOR THOSE THAT REFERENCE MACHINING AND CHIP REMOVAL.

6. Measure rotor thickness and record measurement. Replace rotor if below the minimum thickness specification cast in the rotor.

   CAUTION:
   DO NOT USE ABRASIVE SANDING DISC SINCE IT WILL REMOVE METAL FROM MOUNTING SURFACES AND ADVERSELY AFFECT ROTOR LATERAL RUNOUT.

7. Remove corrosion from wheel mounting surface, both rotor mounting surfaces, and hub mounting surface. A die grinder with a Scotchbrite® surface conditioning disc is recommended.
8. For vehicles with two-piece hub/rotor, reinstall rotor onto hub, aligning with marks from Step 5a.

   NOTE:
   READ THE ENTIRE OPERATING MANUAL AND VIEW THE VIDEO SHIPPED WITH THE LATHE BEFORE INSTALLING, OPERATING, OR SERVICING THE LATHE.

9. Machine rotors using the Rotunda Hub-Mount Brake Lathe / Pro-Cut (201-00002).
   a. Install hub adapter and silencer belt (where applicable).

b. Install cutting lathe.

NOTE:
TOTAL INDICATED READING (TIR) TARGET IS 0.000mm, MAXIMUM IS 0.08mm (0.003").

c. Adjust lathe oscillation using a dial indicator.

NOTE:
DEPTH OF CUT SHOULD BE BETWEEN 0.10 AND 0.20mm (0.004 AND 0.008"). LIGHTER CUTS WILL CAUSE THE BIT TO HEAT UP AND WEAR FASTER. HEAVIER CUTS WILL CAUSE POOR ROTOR SURFACE FINISH.

d. Center cutting head, adjust cutting bits, install chip deflector.

e. Machine rotor.

f. Measure and record rotor thickness.

NOTE:
TARGET LRO IS 0.000mm, MAXIMUM IS 0.05mm (0.002").

g. Install dial indicator, measure and record rotor LRO. Remove dial indicator.

h. Remove lathe and silencer belt.

10. Remove metal shavings.

11. Remove the adapter.

12. For vehicles with two-piece hub/rotors:

    a. Remove rotor from hub.

    b. Remove metal shavings from hub and rotor mounting surfaces and from ABS sensors.

    c. Apply High Temperature Nickel Anti-Seize Lubricant (F6AZ-9L494-AA) to hub mounting surface to prevent future corrosion.

    d. Match marks on rotor and hub and assemble rotor to hub.

13. Install pads and calipers.

NOTE:
USING AN IMPACT TOOL WITHOUT AN ACCUTORQ® SOCKET WILL LEAD TO UNEVENLY TORQUED LUG NUTS. THIS CAUSES ROTOR ON-VEHICLE LRO AND EVENTUALLY DTV AND BRAKE ROUGHNESS.

14. Install wheels using impact guns equipped with Rotunda AccuTorq® sockets. Use a torque wrench on locking lug nuts.

15. Check brake operation before returning to customer.

SUPPORT TELEPHONE NUMBERS

1. Lathe Administration Support: (800) 768-8632

2. Pro-Cut Technical Support: (800) 543-6618

Reference list for Pro-Cut car labor operations:

- A = Aspire
- B = Escort/Tracer
- C = Probe
- D = Contour/Mystique
- E = Mustang
- F = Taurus/Sable
- G = Thunderbird/Cougar
- H = Crown Victoria/Grand Marquis
- I = Continental
- J = Mark VIII
- K = Town Car
- L = Festiva
- M = Tempo/Topaz

ROTUNDA PRO-CUT LABOR OPERATIONS AND TIMES - CAR									
Operation Number	**A**	**B**	**C**	**D**	**E**	**F**	**G**	**H**	**I**
1102FP (one)	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
1102FPT (both)	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1
1102GP (one)	N/A	0.7	0.7	0.7	0.7	0.7	0.7	0.6	0.7
1102GPT (both)	N/A	1.0	1.0	1.0	1.1	1.1	1.1	1.0	1.1
2001A25P (one)	0.3	0.3	0.3	0.3	0.3	0.4	0.3	0.4	0.4
2001A25PT (both)	0.6	0.6	0.6	0.6	0.6	0.7	0.6	0.7	0.7
2001A26P (one)	N/A	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
2001A26PT (both)	N/A	0.6	0.6	0.6	0.6	0.6	0.6	0.5	0.6

ROTUNDA PRO-CUT LABOR OPERATIONS AND TIMES - CAR				
Operation Number	**J**	**K**	**L**	**M**
1102FP (one)	0.7	0.7	0.7	0.7
1102FPT (both)	1.1	1.1	1.1	1.1
1102GP (one)	0.7	0.6	N/A	N/A
1102GPT (both)	1.1	1.0	N/A	N/A
2001A25P (one)	0.3	0.4	0.3	0.3
2001A25PT (both)	0.6	0.7	0.6	0.6
2001A26P (one)	0.3	0.3	N/A	N/A
2001A26PT (both)	0.6	0.5	N/A	N/A

Reference list for Pro-Cut light truck labor operations:

- AA = Villager
- AB = Windstar
- AC = Aerostar 4X2
- AD = Aerostar 4X4
- AE = Ranger 4X2
- AF = Ranger 4X4
- AG = Explorer/Mountaineer 4X2
- AH = Explorer/Mountaineer 4X4
- AI = Econoline
- AJ = F-250 HD/F-350 4X2
- AK = F-250 HD/F-350 4X4
- AL = F-Super Duty
- AM = F-150/F-250 LD 4X2
- AN = F-150/F-250 LD 4X4 And Bronco
- AO = Expedition/Navigator 4X2
- AP = Expedition/Navigator 4X4
- AQ = Super Duty F Series

ROTUNDA PRO-CUT LABOR OPERATIONS AND TIMES - LIGHT TRUCK											
Operation Number	**AA**	**AB**	**AC**	**AD**	**AE**	**AF**	**AG**	**AH**	**AI**	**AJ**	**AK**
1102FP (one)	0.7	0.7	0.7	0.7	0.7	0.7	0.6	0.6	0.7	0.7	0.8
1102FPT (both)	1.1	1.1	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.2	1.4
1102GP (one)	N/A	0.7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
1102GPT (both)	N/A	1.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
2001A25P (one)	0.4	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.4
2001A25PT (both)	0.7	0.7	0.6	0.6	0.6	0.6	0.5	0.5	0.6	0.7	0.8
2001A26P (one)	N/A	0.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
2001A26PT (both)	N/A	0.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

ROTUNDA PRO-CUT LABOR OPERATIONS AND TIMES - LIGHT TRUCK						
Operation Number	**AL**	**AM**	**AN**	**AO**	**AP**	**AQ**
1102FP (one)	N/A	0.7	0.6	0.7	0.6	N/A
1102FPT (both)	N/A	1.0	1.0	1.0	1.0	N/A
1102GP (one)	N/A	N/A	N/A	N/A	N/A	N/A
1102GPT (both)	N/A	N/A	N/A	N/A	N/A	N/A
2001A25P (one)	N/A	0.3	0.3	0.3	0.3	N/A
2001A25PT (both)	N/A	0.6	0.5	0.6	0.5	N/A
2001A26P (one)	N/A	N/A	N/A	N/A	N/A	N/A
2001A26PT (both)	N/A	N/A	N/A	N/A	N/A	N/A

PART NUMBER	PART NAME
F6AZ-9L494-AA	High Temperature Nickel Anti-Seize Lubricant

OTHER APPLICABLE ARTICLES: NONE

SUPERSEDES: 98-4-5

WARRANTY STATUS: INFORMATION ONLY

OASIS CODES: 301000, 702300, 703000, 703400