# 28 DISTRIBUTOR

## REQUIREMENTS AND ADJUSTMENTS

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## 1. GENERAL

1.01 This section contains the requirements and adjustments for the 28 distributor. This section and the teletypewriter general requirements and adjustments section give the complete requirements and adjusting procedures for the maintenance of the 28 distributor.

1.02 This section is reissued to include the adjustment requirements for the contact timing measurements for the later design 28 distributor.

1.03 In this section, left or right, front or rear, and top or bottom apply to the apparatus in its normal operating position as viewed from the front.

1.04 In this section the figures show the adjusting tolerances, positions of moving parts, and spring tensions. The illustrations are arranged so that the adjustments are in the sequence that would be followed if a complete readjustment of the distributor were being made. Where a drawing shows interrelated parts, the sequence that should be followed in checking the requirements and making the adjustments shown on that page is indicated by the letters (A), (B), (C), etc.
2. REQUIREMENTS AND ADJUSTMENTS

A. 28 Distributor Late Design

2.01 Clutch Trip Armature Mechanism

**CLUTCH TRIP ARMATURE AIR GAP**

REQUIREMENT
AIR GAP BETWEEN ARMATURE AND MAGNET ASSEMBLY BRACKET
MIN. 0.004 INCH --- MAX. 0.008 INCH
WHEN ARMATURE IS HELD FLUSH AGAINST MAGNET CORE.

TO ADJUST
REMOVE ARMATURE EXTENSION SPRING, LOOSEN SPRING POST
AND HINGE MOUNTING SCREW AND POSITION HINGE.

**CLUTCH TRIP LEVER**

REQUIREMENT
CLEARANCE BETWEEN ARMATURE EXTENSION LEVER
AND LATCHING SURFACES OF CLUTCH TRIP LEVER
MIN. 0.020 INCH --- MAX. 0.030 INCH
WHEN CLUTCH TRIP LEVER IS ON HIGH PART OF CAM.

TO ADJUST
LOOSEN PLATE ADJUSTING SCREW AND PLATE
MOUNTING SCREW, INSERT SCREWDRIVER IN SLOT
ADJACENT TO ADJUSTING SCREW AND POSITION
PLATE FOR REQUIRED CLEARANCE.

**ARMATURE EXTENSION**

REQUIREMENT
CLEARANCE BETWEEN ARMATURE EXTENSION LEVER AND CLUTCH
TRIP LEVER
MIN. 0.030 INCH --- MAX. 0.040 INCH
WHEN CLUTCH TRIP LEVER IS ON HIGH PART OF CAM AND
ARMATURE IS FLUSH AGAINST CORE (PLAY TAKEN UP WITH SPRING).

TO ADJUST
LOOSEN BRACKET MOUNTING SCREW AND BRACKET ADJUSTING
SCREW AND INSERT SCREWDRIVER INTO SLOT BELOW ADJUSTING
SCREW, AND ADJUST BRACKET.
2.02 Clutch Stop Arm, Shoe Lever, and Cam Follower Guide

**CLUTCH STOP ARM**

**REQUIREMENT**
With Clutch Trip Lever in Latched Position, Clutch Lever Shall Fully Engage Clutch Shoe Lever.

**TO ADJUST**
With Clutch in Stop Position, Loosen Clutch Trip Clamping Screw and Adjust Clutch Stop Lever to Obtain Full Bite with Clutch Shoe Lever.

**NOTE:** When Armature is in Attracted Position, Clutch Stop Arm Shall Clear Stop Lever and Stop Lug by at Least Some Clearance.

**CLUTCH SHOE LEVER**

**REQUIREMENT**
Clearance between Clutch Shoe Lever and Extension Shall Be

- Min. 0.055 Inch
- Max. 0.085 Inch

Greater When Clutch is Engaged Than When Disengaged.

**TO ADJUST**
Loosen Two Clamp Screws in Clutch Disk, Rotate Adjusting Disk to Obtain Proper Clearance.

**NOTE:** After Above Adjustment is Made, Disengage Clutch and Rotate Drum in Normal Rotation to Make Certain It Does Not Drag on Shoes. If Drum Drags, Refine Adjustment.

**CAM FOLLOWER GUIDE**

**REQUIREMENT**
Cam Follower Guide Oriented so Center Cam Follower is Fully on Cam When Follower is Moved Sideways in Guide Slot. Others Must Have at Least 75% Bite When Moved in Either Direction, and Be Free in Their Guide Slots.

**TO ADJUST**
2.03 Distributor Block Assembly, Contact Gap, and Clutch-shoe Lever Spring

**Distributor Block Assembly**

**Requirement**

Distributor block assembly positioned on casting so that rocker levers are fully engaged with the bakelite on the follower levers.

**To Adjust**

Loosen distributor block assembly mounting screws and position block left or right to obtain requirement.

**Distributor Contact Gap**

**Requirement**

Contact gap shall be

Min. 0.020 inch -- Max. 0.030 inch

With cam follower lever on high part of cam.

**To Adjust**

Turn contact screw at socket end until desired gap is obtained. Check all contact gaps.

**Note:** Position follower on high part of cam by tripping clutch manually and rotating distributor shaft.

**Clutch Shoe Lever Spring**

**Requirement**

Clutch engaged. Clutch disk held to prevent its turning

Min. 15 ozs. -- Max. 20 ozs.

To pull shoe lever in contact with lug on clutch disk.
2.04 Clutch Shoe and Distributor Cam Follower Springs

NOTE
As it requires removal of clutch from shaft, this spring tension shall not be checked unless there is good reason to suspect that it will not meet its requirement.

CLUTCH SHOE SPRING

REQUIREMENT
Clutch drum removed. Min. 3 ozs.; max. 5 ozs.
To start primary shoe moving away from secondary shoe.

DISTRIBUTOR CAM FOLLOWER SPRING

REQUIREMENT
Distributor block removed. Min. 1/2 oz.; max. 1-1/2 ozs.
To start cam follower lever moving when lever is on high part of cam.

2.05 Distributor Rocker and Compression Springs

ROCKER SPRING

COMPRESSION SPRING

DISTRIBUTOR ROCKER SPRING

REQUIREMENT
With compression springs removed and contacts initially adjusted so contact surface is approximately 1/32 inch below outer surface of contact block. Min. 2 ozs.; max. 4 ozs.
To separate contacts.

DISTRIBUTOR ROCKER COMPRESSION SPRING

REQUIREMENT
With compression springs installed. Min. 6-1/2 ozs.; max. 9-1/2 ozs.
To just separate contacts.
2.06 Clutch Latch Lever, Trip Lever, and Magnet Armature Bail Springs

**Clutch Latch Lever Spring**

Requirement:
Clutch latch lever on low of clutch disk (but not latched)
Min. 2-1/2 ozs. --- Max. 4-1/2 ozs.
To start latch lever moving.

**Clutch Trip Lever Spring**

Requirement:
Clutch tripped and armature held against magnet core
Min. 2 ozs. --- Max. 3-1/2 ozs.
To start trip lever moving.

**Clutch Magnet Armature Bail Spring**

Requirement:
Clutch magnet tripped and shaft rotated manually until trip follower is on high part of cam
Min. 3 ozs. --- Max. 4-1/2 ozs.
To start armature extension lever moving.

2.07 Gears:
(a) Requirement: The gears shall be aligned and there shall be a barely perceptible backlash between the gears at their closest point.
(b) To Adjust: Position the unit by loosening the four mounting screws located on top of the U-shaped bracket.
2.08 Distributor Timing Contact Measurements

THE FOLLOWING TESTS REQUIRE THE USE OF A IA TELETYPewriter TEST SET. TESTS SHALL BE MADE WITH THE TEST SET CONNECTED TO THE OUTPUT OF THE DISTRIBUTOR CONTACTS WITH THE TEST SET OPERATING AT THE SAME SPEED AS THE DISTRIBUTOR.

(A) DISTRIBUTOR CONTACTS

REQUIREMENTS

1) LENGTH OF TRACE SHALL EXTEND FROM ZERO TO 142 ± 4 DIVISIONS.
   ALIGN END OF STOP PULSE IMAGE WITH 142 MARK ON STOP SEGMENT OF TEST SET.

   TO ADJUST - POSITION STOP CONTACT ADJUSTING SCREW.

2) LENGTH OF NO. 1 THROUGH NO. 5 TRANSMITTED PULSES SHALL NOT DEVIATE MORE THAN ± 4 DIVISIONS.

   TO ADJUST - POSITION NO. 1 THROUGH NO. 5 CONTACT ADJUSTING SCREWS.

(B) DISTRIBUTOR AUXILIARY CONTACTS

REQUIREMENT

WITH TEST SET CONNECTED TO AUXILIARY CONTACT "A" OR CONTACT "B", ALIGN END OF STOP PULSE IMAGE WITH 142 MARK ON STOP SEGMENT OF TEST SET SCALE.

CONTACT "A" SHALL CLOSE AT 32 ± 15 DIVISIONS IN START PULSE SEGMENT OF TEST SET SCALE AND OPEN AT 29 ± 15 DIVISIONS IN STOP PULSE SEGMENT OF TEST SET SCALE.

CONTACT "B" SHALL CLOSE AT 25 ± 15 DIVISIONS IN NO. 1 PULSE SEGMENT OF TEST SET SCALE AND OPEN AT 75 ± 15 DIVISIONS IN NO. 5 PULSE SEGMENT OF TEST SET SCALE.

TO ADJUST - POSITION CONTACT ADJUSTING SCREWS.
B. 28 Distributor Early Design

2.09 Mainshaft Mechanism

NOTE:
TO FACILITATE ITS ADJUSTMENT, UNIT SHOULD BE REMOVED FROM BASE.
THE FOLLOWING ADJUSTMENTS APPLY FOR 60, 75 AND 100
WORD PER MINUTE OPERATION UNLESS IT IS STATED
OTHERWISE IN SPECIFIC ADJUSTING INSTRUCTIONS.

CAM SLEEVE

SHIMS

LEFT SIDE PLATE BEARING

CAM SLEEVE END PLAY
REQUIREMENT
CAM SLEEVE SHOULD HAVE
SOME END PLAY:
MAX. 0.005 INCH.
TO ADJUST
ADD OR REMOVE SHIMS
AS REQUIRED.

(FRONT VIEW)
2.10 Clutch Trip Magnet Mechanism

(A) CLUTCH LATCH LEVER SPRING
REQUIREMENT
LATCH LEVER RESTING AGAINST
LUG ON CLUTCH DISK.
MIN. 1 OZ — MAX. 2 OZS.
TO START LATCH LEVER MOVING.

(B) CLUTCH TRIP LEVER SPRING
TO CHECK
DISENGAGE CLUTCH, PULL ARMATURE
FORWARD AGAINST POLE PIECES TO UNLATCH
TRIP LEVER, HOLD ARMATURE AGAINST
POLE PIECES AND MEASURE TENSION.
REQUIREMENT
MIN. 5 OZS. — MAX. 8 OZS.
TO START LEVER MOVING.

(C) MAGNET BRACKET
REQUIREMENT
ARMATURE SPRING UNHOOKED, MAGNETS
ENERGIZED.

(1) ARMATURE SHOULD CONTACT BOTH POLE
PIECES.
(2) MEASURED AT THE CLOSEST POINT, THERE
SHOULD BE SOME CLEARANCE BETWEEN ARMATURE
BAIL AND CLUTCH TRIP LEVER:
MAX. 0.006 INCH

TO ADJUST
POSITION MAGNET BRACKET WITH TWO
MOUNTING SCREWS FRICTION TIGHT.

ARMA TURE BAIL
POLE PIECE
MAGNET
MAGNET BRACKET
MOUNTING SCREWS (TWO)
2.10 Clutch Trip Magnet Mechanism (Cont)

CLUTCH TRIP LEVER AND LATCH LEVER REQUIREMENT
CLUTCH DISENGAGED,
(1) TRIP LEVER SHOULD FULLY ENGAGE SHOE LEVER,
(2) LATCH LEVER SHOULD ENGAGE FULL WIDTH OF CLUTCH DISK
TO ADJUST DISENGAGE LATCH LEVER, POSITION TRIP MECHANISM BRACKET WITH MOUNTING SCREWS LOOSENED.
(A) ARMATURE SPRING

1. REQUIREMENT
   CLUTCH TRIP LEVER UNLATCHED.
   MAGNETS DE-ENERGIZED.
   MIN. 4 1/4 OZS.—MAX. 5 1/2 OZS.
   TO START ARMATURE BAIL MOVING.

2. REQUIREMENT
   MAGNETS DE-ENERGIZED. RESET
   ROLLER ON HIGH PART OF CAM
   MIN. 4 1/4 OZS.—MAX. 5 1/2 OZS.
   TO START ARMATURE BAIL MOVING.

(B) ARMATURE SPRING

1. REQUIREMENT
   ARMATURE BAIL
   CLEARANCE BETWEEN LATCHING
   SURFACE OF ARMATURE BAIL AND
   CLUTCH TRIP LEVER:
   MIN. 0.012 INCH—MAX. 0.020 INCH
   TO ADJUST
   POSITION TRIP LEVER ON RESET LEVER
   WITH CLAMP SCREW LOOSENED.

NOTE:
IF ANY CHANGE IS MADE IN THIS
ADJUSTMENT, RECHECK CLUTCH
TRIP LEVER AND LATCH LEVER
ADJUSTMENT.
2.11 Clutch and Trip Mechanism

(A) CLUTCH SHOE LEVER REQUIREMENT
CLEARANCE BETWEEN SHOE LEVER AND LUG ON CLUTCH DISK SHOULD BE:
MIN. 0.055 INCH—MAX. 0.085 INCH
GREATER WHEN CLUTCH IS ENGAGED THAN WHEN IT IS DISENGAGED.
TO ADJUST LOOSEN TWO CLAMP SCREWS, ENGAGE A WRENCH ON ADJUSTING DISK LUG AND ROTATE DISK.

NOTE AFTER MAKING THIS ADJUSTMENT, DISENGAGE CLUTCH AND ROTATE SHAFT. IF THERE IS ANY DRAG ON CLUTCH DRUM, REFINISH ADJUSTMENT.

(B) TRIP LEVER SHAFT SPRING REQUIREMENT
SPRING SHOULD HOLD LATCH LEVER FIRMLY AGAINST BUSHING IN TRIP LEVER WITHOUT AFFECTING LATCH LEVER SPRING TENSION REQUIREMENT.

CLUTCH LATCH LEVER — CLUTCH DISENGAGED
2.12 Clutch

(A) Clutch Shoe Lever Spring Requirement
Clutch engaged. Clutch disk held to prevent its turning.
Min. 16 ozs—Max. 20 ozs.
To pull shoe lever in contact with lug on clutch disk.

(Right Side View)

(B) Clutch Shoe Spring Requirement
Clutch drum removed.
Min. 3 ozs—Max. 5 ozs.
To start primary shoe moving away from secondary shoe.

Note: As it requires removal of clutch from shaft, this spring tension should not be checked unless there is good reason to suspect that it will not meet its requirement.
2.13 Contact Mechanism

(A) CONTACT BRACKET
REQUIREMENT
EACH CONTACT LEVER SHOULD FULLY ENGAGE ITS CAM TO ADJUST POSITION CONTACT BRACKET WITH MOUNTING SCREWS LOOSENED.

(B) CONTACT LEVER SHAFT SPRING
REQUIREMENT
SPRING SHOULD HOLD CONTACT LEVERS FIRMLY AGAINST SPACERS WITHOUT AFFECTING CONTACT GAP ADJUSTMENT AND LONG CONTACT SPRING ADJUSTMENT. TO ADJUST TO ELIMINATE SIDE PLAY ADD SHIMS. TO ELIMINATE BINDING REMOVE SHIMS AND LUBRICATE SPRING AND CONTACT LEVERS.
(A) CONTACT GAP AND SHORT CONTACT SPRING

(1) REQUIREMENT
SHORT CONTACT SPRING SHOULD REST AGAINST ITS STOP SCREW WITH PRESSURE OF:
MIN. 4 OZS. — MAX. 8 OZS.

(2) REQUIREMENT
CONTACT LEVER ON HIGH PART OF CAM ASSOCIATED CONTACT GAP SHOULD BE:
MIN. 0.017 INCH — MAX. 0.023 INCH
START-STOP CONTACT GAP SHOULD BE:
MIN. 0.015 INCH — MAX. 0.025 INCH

TO ADJUST
BACK OFF STOP SCREW ALL THE WAY. BEND SHORT CONTACT SPRING SO THAT IT MEETS REQUIREMENT (1). POSITION STOP SCREW SO THAT GAP MEETS REQUIREMENT (2). RECHECK SHORT SPRING PRESSURE. REFINE ADJUSTMENT IF NECESSARY.

(LEFT SIDE VIEW)

(B) LONG CONTACT SPRING (PRELIMINARY — CONTINUED ON NEXT PAGE).

REQUIREMENT
CONTACT LEVER ON HIGH PART OF CAM.
7 OZS.
TO START SPRING MOVING.
2.13 Contact Mechanism (Cont)

NOTE
THESE ADJUSTMENTS SHOULD BE MADE FOR EACH OF THE CONTACTS ON THE DISTRIBUTOR.

TO ADJUST
BACK OFF STOP SCREW ALL THE WAY. ROTATE CAM SLEEVE UNTIL ASSOCIATED CONTACT LEVER IS ON LOW PART OF CAM. FACE REAR OF UNIT.

1. TO INCREASE SPRING PRESSURE:
   FROM RIGHT SIDE, INSERT CONTACT SPRING BENDER WITH PROJECTION DOWNWARD BETWEEN CONTACT BRACKET AND SPRING STIFFENER. ROTATE SPRING BENDER CLOCKWISE TO BEND SPRING AND SPRING STIFFENER.

2. TO DECREASE SPRING PRESSURE:
   FROM RIGHT SIDE, INSERT SPRING BENDER WITH PROJECTION UPWARD BETWEEN LONG AND SHORT CONTACT SPRINGS. ROTATE SPRING BENDER CLOCKWISE TO BEND SPRING AND SPRING STIFFENER.

LONG CONTACT SPRING (FINAL)
REQUIREMENT
CONTACT LEVER ON LOW PART OF CAM
MIN. 5 OZS—MAX. 6 OZS
TO OPEN ASSOCIATED CONTACT.

TO ADJUST
REFINE PRELIMINARY LONG CONTACT SPRING ADJUSTMENT.
RECHECK CONTACT GAP AND SHORT CONTACT SPRING ADJUSTMENT, READJUST IF NECESSARY.