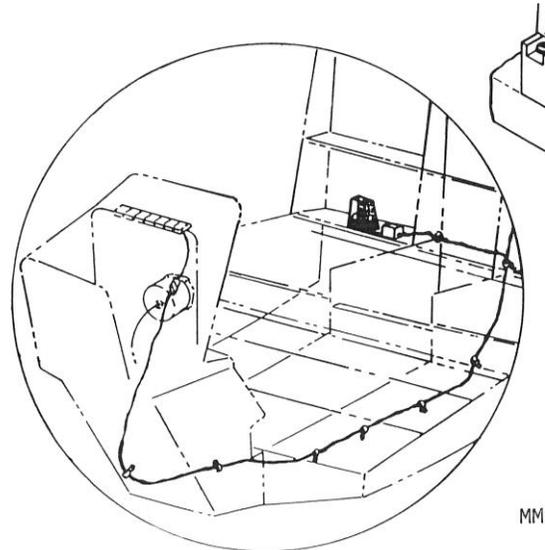


## Troubleshooting the Low Rotor Warning System



FIG 1



### Operation Basics;

There are two power sources for the Low RPM Warning system, one is from the **INSTRUMENT** circuit breaker, though the caution panel lights: and the other is from a fuse that is either an inline fuse attached to the back of the switch panel buss bar or installed in the pilot's side of the instrument panel pedestal.

The function of the Speed Amplifier (Signal Conditioner) is to regulate the ground connections for the **LOW ROTOR RPM** light and audio warning horn.

Power to the annunciator panel is supplied from the instrument circuit breaker to terminal 2 of the annunciator panel.

Power to the Low RPM warning system is supplied from:

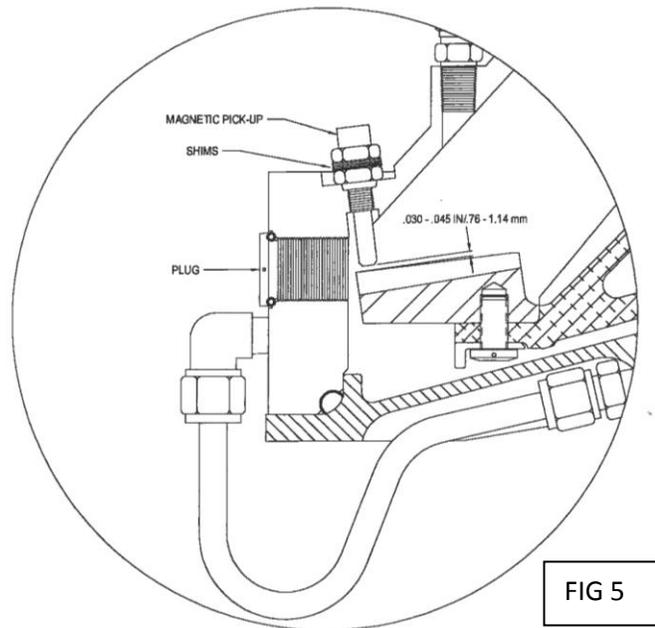
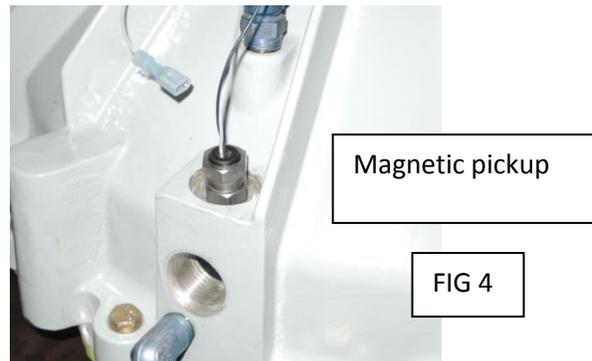
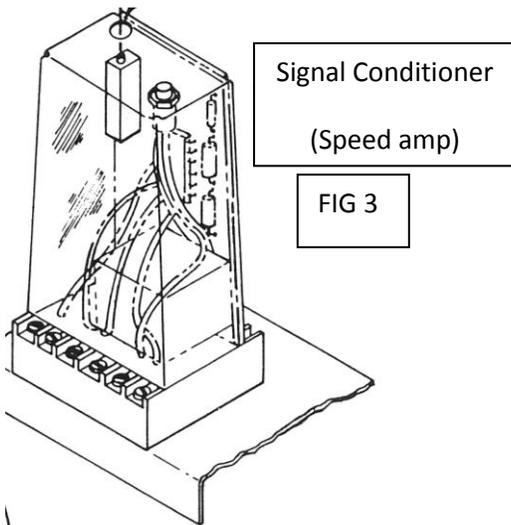
- An inline fuse at buss (or on side of pedestal) (On older helicopters it will be from an inline fuse behind the instrument panel)
- Through the annunciator panel warning lamps.

The grounds for the warning circuits are controlled by the speed amplifier internally switching on and off the connection between pins 1 and 2 on the speed amplifier.



When the rotors are not turning and the clutch is disengaged, current flows from the instrument circuit breaker, through the annunciator panel **CLUTCH DISSENGAGED** lamp, through the normally closed switch on the clutch capsule to ground, - lighting the **CLUTCH DISSENGAGED** light.

When the clutch handle is engaged, current flows from the instrument panel circuit breaker, through the **LOW ROTOR RPM** light to pin 1 of the signal conditioner; and also from the inline fuse through the audio horn and the audio tone generator to terminal 1 of the signal conditioner. The switch on the clutch capsule disconnects the **CLUTCH ENGAGE** light and connects Pin 7 to ground.



The speed amplifier uses the magnetic pick-up installed in the transmission to monitor the rotor RPM. When the rotor RPM is above the triggering RPM, the signal conditioner disconnects the ground circuit between Pin 1 and 2, and extinguishes the caution light and the audio horn.

**Troubleshooting:**

1. With the engine switched off:
  - a. Remove the signal conditioner from its base and using an ohmmeter, check between socket 7 and 8 for 270 to 330 ohms. (FIG 3)
    - i. This operation checks the condition of magnetic pick-up and the connections at the socket base.
    - ii. If the resistance is not within limits;
      1. Check across the magnetic pickup at the transmission with the wires disconnected for 270 to 330 ohms.
      2. If the resistance is not correct, replace the magnetic pickup in accordance with section 7-21 in the TH-28/480 Series Maintenance Manual. (FIG 4 & FIG 5)
  - b. Engage the clutch and check for resistance between socket pin 7 and ground. (Checks the ground connection for the magnetic pick-up.)
  - c. Switch on the battery switch and Jump across the pin 1 and pin 2 in the speed amplifier base. The **LOW ROTOR RPM** light should come on. (This procedure checks the connection between the base of the signal amplifier and ground.)
  - d. Lift the collective and the audio horn and the headset audio warning signal should sound. (This procedure checks the operation of the collective switch.) (FIG 6)

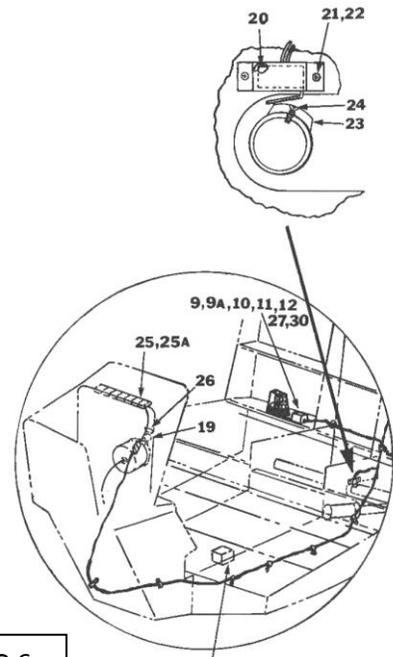


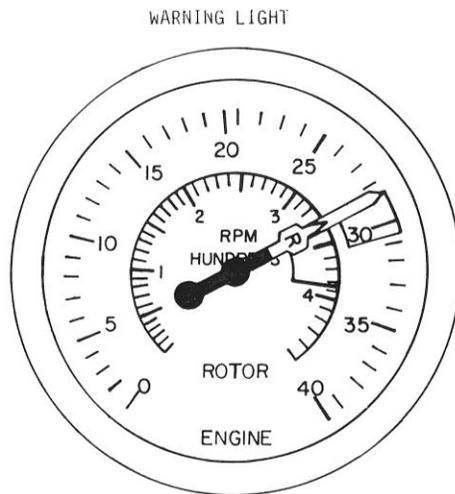
FIG 6

## 2. Additional Troubleshooting Procedures:

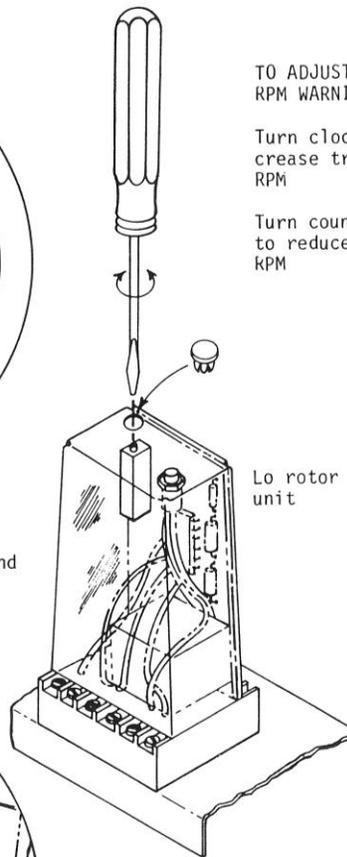
- a. Check the wire and wire terminal conditions at the speed conditioner base.
- b. Remove the speed conditioner base from the seat structure and inspect the connections on the back side.
- c. With the engine not operating, the signal conditioner installed, and the clutch disengaged:
  - i. Turn on the Battery switch, the **CLUTCH ENGAGE** light should be on.
  - ii. Engage the clutch, the **CLUTCH ENGAGE LIGHT** should go **OFF** and the **LOW RPM** light should go **ON**. The audio horns should not sound. (The collective switch (FIG 6) is open with the collective down and closed with the collective up.)
    1. If the horn sounds with the collective down:
      - a. There is a short in wire circuit 42-4A, B, or C. (FIG 2)
      - b. The micro switch under the seat is closed or shorted across the terminals or to ground. (FIG 6)
    - iii. Remove the signal conditioner from its base, the horn should be silent and the **LOW RPM** light should go **OFF**. This indicates that the circuits' 42-4A, B and C are OK. (FIG 2)
      1. Jump socket 1 and 2.
      2. Operate the collective up and down, when the collective is up the horn should sound and when it is down the horn should not sound. This tests the collective switch circuits.
      3. If one of the audio systems works and the other does not, the individual component circuit has a problem. (Horn and Audio Tone Generator)
  - d. If all of the above tests show the system is operating correctly;
    - i. Run the helicopter with the RPM in the green. If the light is on and the horn is sounding, disconnect the wire from terminal 2 of the signal conditioner.
    - ii. Use a volt meter to check between pin 1 and ground, 24 volts should be present.

- iii. Check for voltage at terminal 2.
  1. At rotor speeds less than 334, 24 volts should be present at pin 2 and at speeds above 334 there should be no voltage at pin 2.
  2. Turn the **SPEED ADJUST** screw in both directions. The **SPEED ADJUST** screw should control the rotor speed switching on and off 24 volts at pin 2.

MAINTENANCE MANUAL SUPPLEMENT



Set rotor RPM needle at 334 - warning light should come on at a decreasing RPM at 334 and lower and off at an increasing RPM above 334 RPM

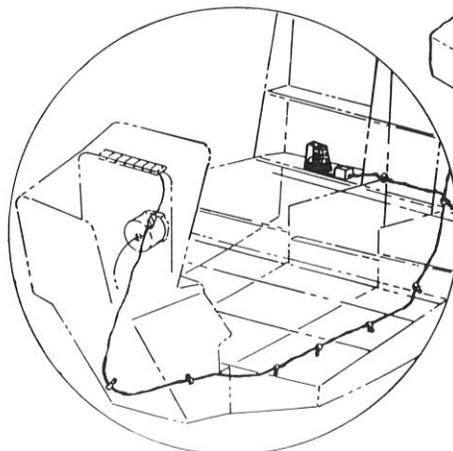


TO ADJUST LO ROTOR RPM WARNING LIGHT:

Turn clockwise to increase trip point or RPM

Turn counter clockwise to reduce trip point or RPM

Lo rotor RPM control unit



Typical locations

Lo rotor RPM indicator adjustment  
FIGURE 21-5

MM-21-8