



FOR DYNA II RAMP GENERATOR — DYN2-90000 AND DYNA II DUAL RAMP GENERATOR — DYN2-90006

DYN2-90000 SYSTEM OPERATION and CALIBRATION PROCEDURE

Wire the DYN2-90000 into the circuit in accordance with the proper wiring diagram. The ramp generator wiring has a ramp switch which causes the engine to operate at a low speed (idle) with the switch in the open position. When the ramp switch is in the closed (run) position, the engine speed (RPM) is allowed to ramp up at a controlled rate until it reaches the commanded speed set into the DYNA governor controller.

The "idle speed" is set by a potentiometer on the ramp generator module after the desired operating (run) speed is set into the DYN1 governor controller by adjusting the internal "speed" potentiometer and the remote speed potentiometer if one is used. This "idle speed" is set with the ramp switch in the open position.

The time of the ramp function can be adjusted from 0.5 to 10 seconds by setting the "ramp time" potentiometer on the ramp generator. By adding a 180 mfd. capacitor of the proper type [Barber-Colman part number E13-13-1 (sprague type 137D, G.E. type 69F, CDE type TX67 or equivalent)] the time can be increased to 20 seconds.

Calibration Procedure

Completely wire the system in accordance with the proper wiring diagram. Observe proper shielding practices.

1. Turn the ramp time, idle speed adjustments fully clockwise.
2. Close the Ramp Switch between terminals 4 and 5 on the DYN2-90000.
3. Carefully start the engine and adjust the governor "speed" potentiometer in the DYN1 controller to obtain the maximum desired engine RPM.

4. Calibrate the governor in accordance with the Barber-Colman Calibration Procedure.
5. Run the engine over the entire speed and load range to confirm that it is stable under all conditions.

Note: The IDLE SPEED as set on the DYN2-90000 will vary with the speed setting of the governor.

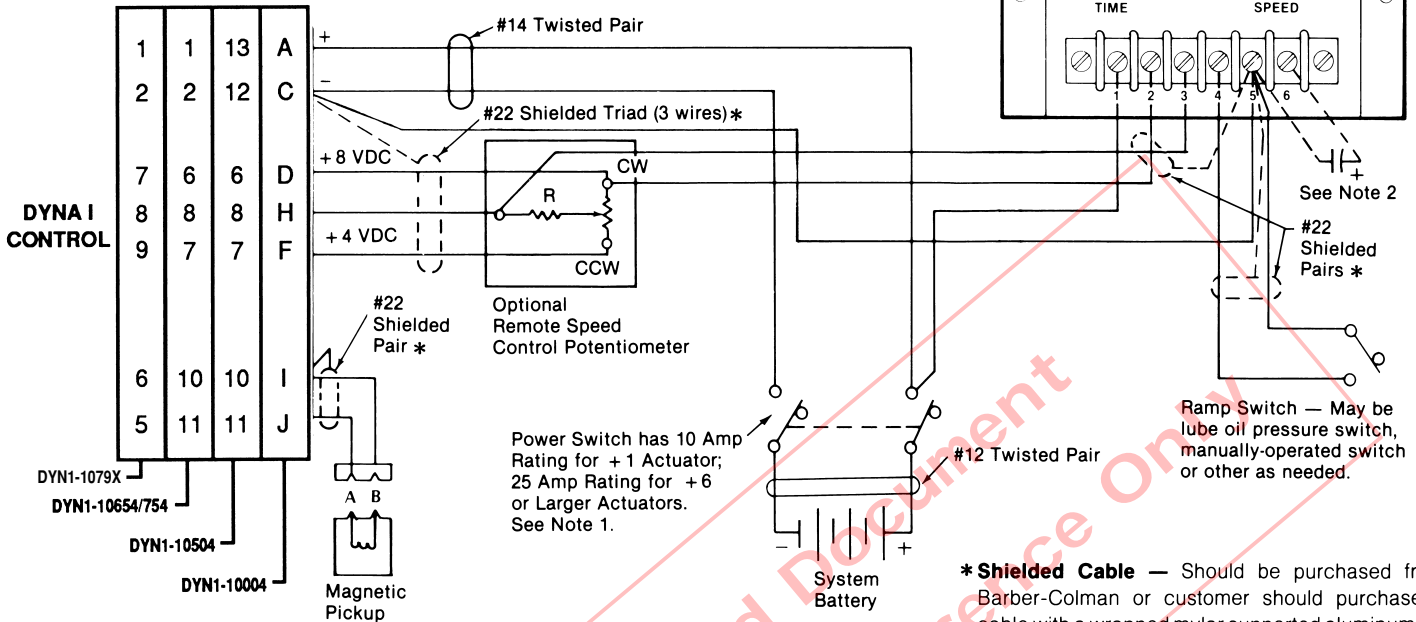
6. Open the RAMP SWITCH between terminals 4 and 5 of the DYN2-90006.
7. Slowly turn the IDLE SPEED potentiometer, on the DYN2-90000, counterclockwise until the engine is operating at the desired IDLE SPEED.
8. Close the ramp switch. The engine should slowly accelerate up to the RUN speed.
9. If a shorter ramp time is desired, turn the RAMP TIME adjustment counterclockwise slightly and test the ramp time. Without an external capacitor, the ramp time will be approximately 0.5 seconds when the RAMP TIME adjustment is fully counterclockwise and 10 seconds when it is fully clockwise.
10. When the desired ramp time is obtained, turn the engine off.
11. With the ramp switch in the open (IDLE) position, start the engine. The engine should start and come to the Idle speed with a minimum of overshoot.
12. The Ramp Generator is now properly calibrated.

Electrical Connections — DYN2-90000

Typical Connections Between DYNA II Ramp Generator and DYNA I Governor

NOTES:

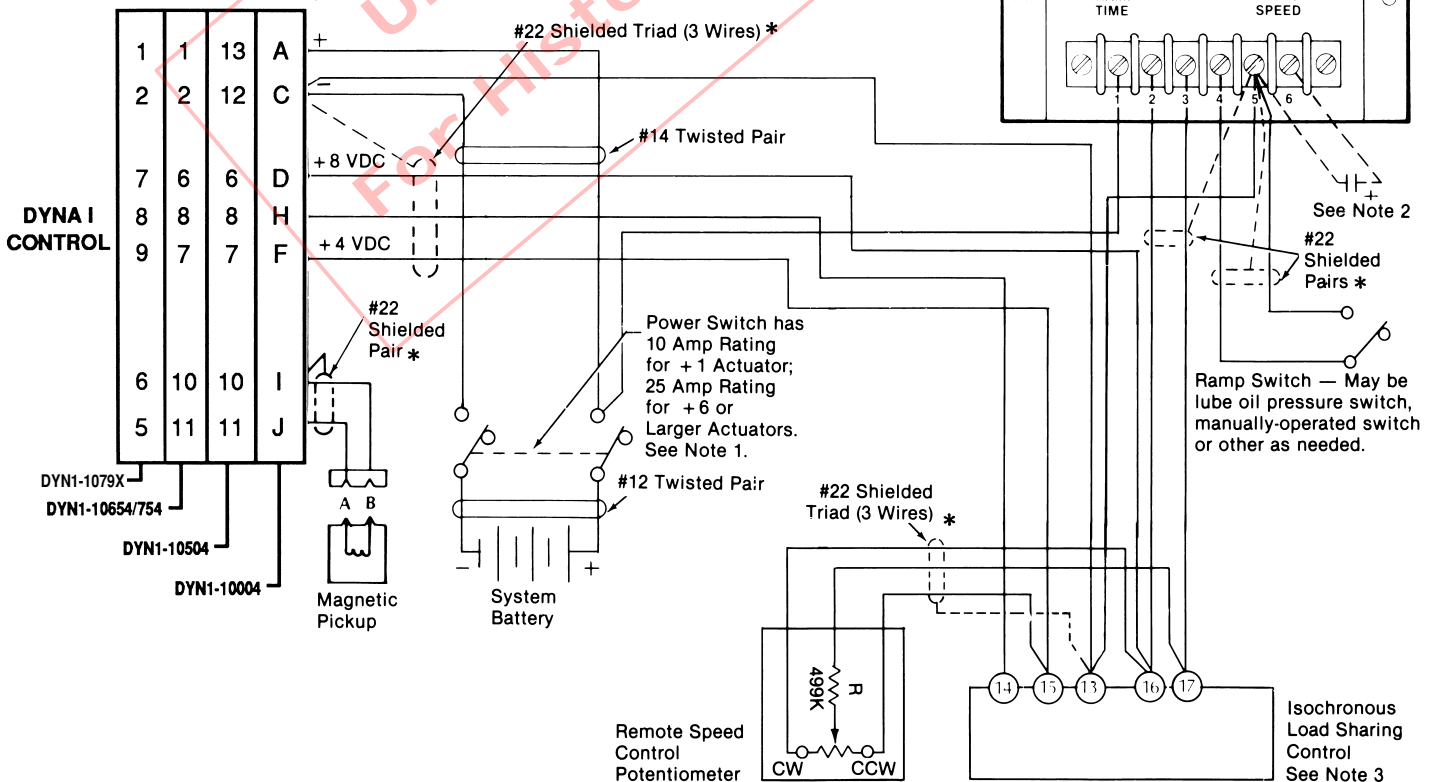
1. Twisted No. 12 pair and connector required for connection of power from power switch to +6 or larger actuators.
2. Connecting a 180 MFD (25 vdc) capacitor to terminals 5 and 6 increases ramp time adjustment range to 20 seconds.



Typical Connections to DYNA II Ramp Generator When Isochronous Load Sharing Control Is Used.

NOTES:

1. Twisted No. 12 pair and connector required for connection of power from power switch to +6 or larger actuators.
2. Connecting a 180 MFD (25 vdc) capacitor to terminals 5 and 6 increases ramp time adjustment range to 20 seconds.
3. Only wiring between ILS terminals 13, 14, 15, 16, 17 and ramp generator is illustrated. Other system wiring not shown.



DYN2-90006 SYSTEM OPERATION and CALIBRATION PROCEDURE

System Operation

Wire the DYN2-90006 into the circuit in accordance with the proper wiring diagram. The Dual Ramp Generator is normally wired as an addition to a standard system. It can be wired as a dual ramp generator or a starting lag module. A dual ramp generator is a system where there is an idle/run switch. As with a standard speed ramp generator it causes the engine to operate at a low speed (IDLE) with the switch in the open position. When the switch is placed in the closed (RUN) position, the speed of the engine ramps up at a controlled rate to a higher speed. The IDLE speed is set by a potentiometer on the ramp generator module after the RUN speed is set by the DYN1 governor control box (in combination with a remote speed adjustment if one is used). The time of the ramp function can be adjusted from 0.5 to 10 seconds by setting the RAMP TIME adjustment. By adding a 180 mfd capacitor of the proper type [Barber-Colman Part Number E 13-13-1 (Sprague Type 137D, G.E. Type 69F, CDE Type TX67 or equivalent)] the time can be increased to 20 seconds.

The Dual Ramp Generator operates the same as the standard Ramp Generator except that it has an additional function. It also provides a limit with a time ramp which works into the Least Selector of the Barber-Colman DYN1 electronic governor. This limits the stroke of the actuator. This is useful for providing a smooth start and ramp to speed on engines where it is not desirable to quickly open or fully open the fuel control during a start or speed change. This is generally required on natural gas engines where there is a relatively long lag in the intake manifold.

A Lag Module is basically the same as a Dual Ramp Circuit except there is no IDLE/RUN switch. Once the unit is energized it starts to ramp up to set speed. This is used for natural gas engines that must immediately go to a speed set by some external adjustment upon start.

Calibration Procedure

Completely wire the system in accordance with the proper wiring diagram. Observe proper shielding practices.

1. Turn the Ramp Time, Idle Speed and Fuel Limit adjustments on the DYN2-90006 fully clockwise.
2. Close the RAMP SWITCH between terminals 4 and 5 on the DYN2-90006.
3. Carefully start the engine and bring it to speed. This may require manually operating the actuator output. To do this, the actuator would be held to minimum as the engine is cranked over. It is gradually opened until the engine is running with the governor in control.

4. The engine speed should be set at minimum with as light a load as possible applied.
5. Calibrate the governor in accordance with the Barber-Colman Calibration Procedure.

6. Run the engine over the entire speed and load range to confirm that it is stable under all conditions.

Note: The IDLE SPEED as set on the DYN2-90006 will vary with the speed setting of the governor.

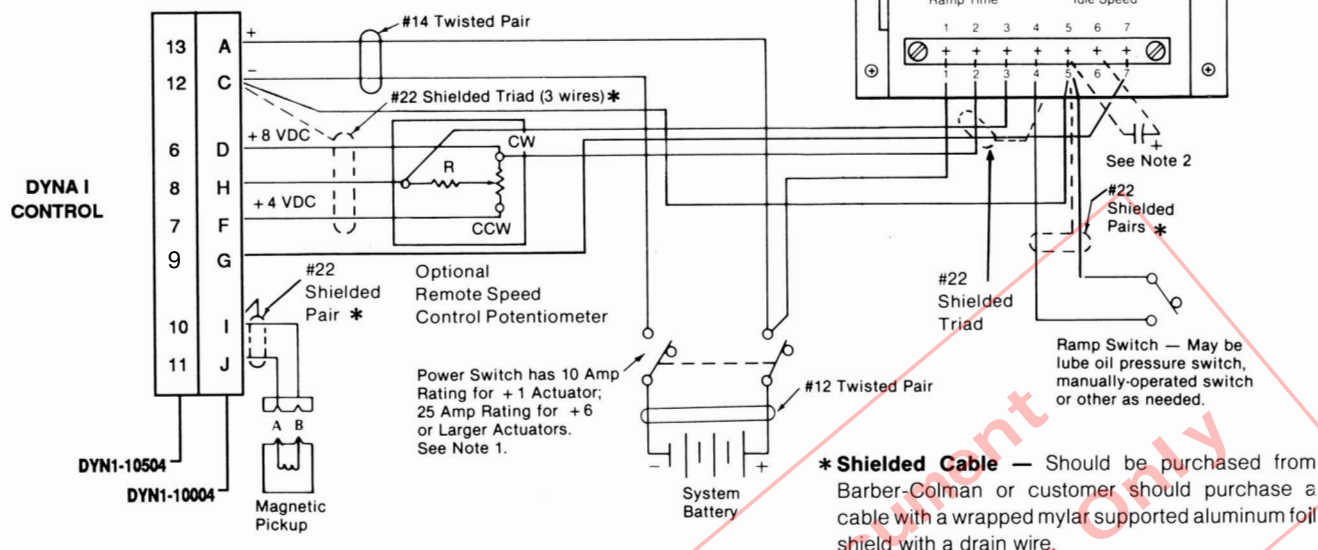
7. Set the governor speed to the lowest speed desired for adjustment or the normal running speed.
8. Open the RAMP SWITCH between terminals 4 and 5 of the DYN2-90006.
9. Slowly turn the IDLE SPEED potentiometer counterclockwise until the engine is operating at the desired IDLE SPEED.
10. With the normal load on the engine for the IDLE SPEED, slowly turn the FUEL LIMIT counterclockwise. Turn it counterclockwise until the engine speed starts to reduce. One can observe the actuator lever and watch for it to start to reduce. Carefully turn the FUEL LIMIT slightly clockwise until the engine is again operating at the proper IDLE speed. Turn the FUEL LIMIT an additional one-half hour turn clockwise.
11. Close the ramp switch. The engine should slowly accelerate up to the RUN speed.
12. If a shorter ramp time is desired, turn the RAMP TIME adjustment counterclockwise slightly and test the ramp time. Without an external capacitor, the ramp time will be approximately 0.5 seconds when the RAMP TIME adjustment is fully counterclockwise and 10 seconds when it is fully clockwise.
13. When the desired ramp time is obtained, turn the engine off.
14. As an added means of protection, have somebody ready to manually close the fuel control if needed.
15. With the ramp switch in the open (IDLE) position, start the engine. The engine should start and come to the Idle speed with a minimum of overshoot. If there seems to be too much overshoot, carefully turn the Fuel Limit adjustment slightly counterclockwise. One must be careful to not turn the Fuel Limit too far counterclockwise because there might not be adequate fuel to start and run the engine when it is cold.
16. The Dual Ramp Generator is now properly calibrated.

Electrical Connections — DYN2-90006

Typical Connections Between DYNA II Ramp Generator and DYNA I Governor

NOTES:

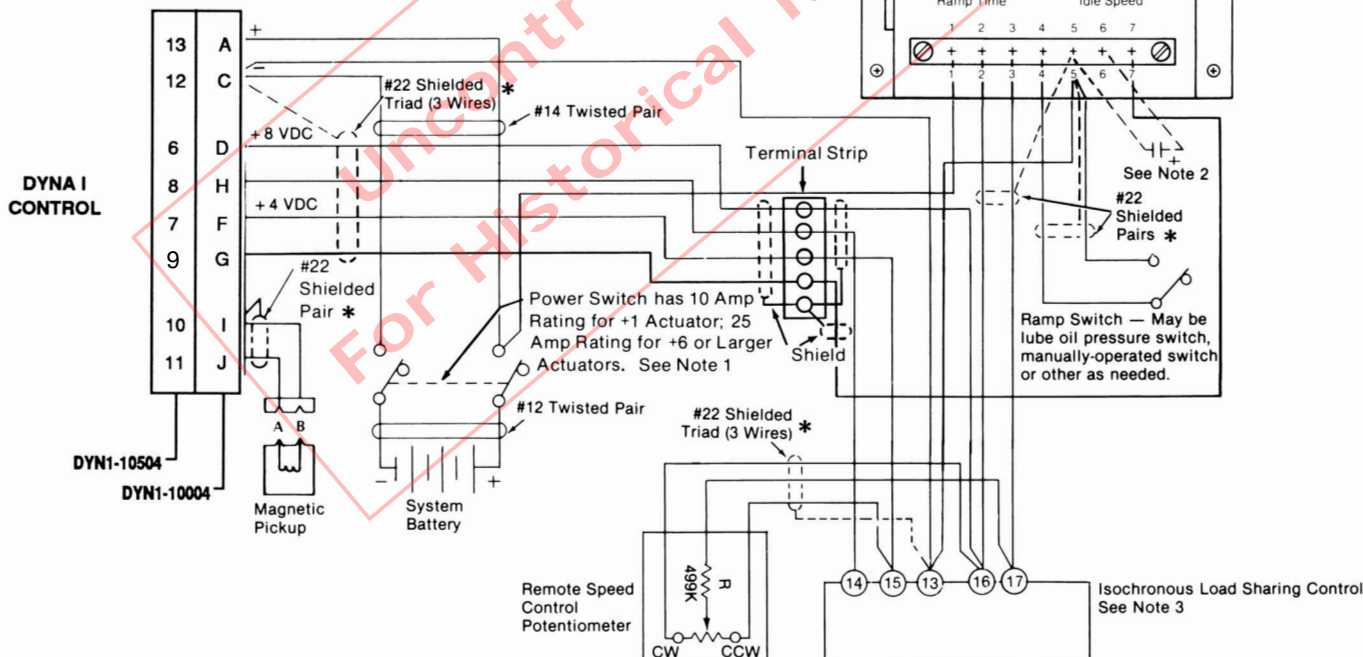
1. Twisted No. 12 pair and connector required for connection of power from power switch to +6 or larger actuators.
2. Connecting a 180 MFD (25 vdc) capacitor to terminals 5 and 6 increases ramp time adjustment range to 20 seconds.



Typical Connections to DYNA II Ramp Generator When Isochronous Load Sharing Control Is Used.

NOTES:

1. Twisted No. 12 pair and connector required for connection of power from power switch to +6 or larger actuators.
2. Connecting a 180 MFD (25 vdc) capacitor to terminals 5 and 6 increases ramp time adjustment range to 20 seconds.
3. Only wiring between ILS terminals 13, 14, 15, 16, 17 and ramp generator is illustrated. Other system wiring not shown.



NOTE

Barber-Colman believes that all information provided herein is correct and reliable and reserves the right to update at any time. Barber-Colman does not assume any responsibility for its use unless otherwise expressly undertaken.

Barber-Colman DYNA Products

1354 Clifford Avenue (Zip 61111)
P.O. Box 2940
Loves Park, IL 61132-2940
United States of America

Telephone (815) 637-3000
Facsimile (815) 877-0150
www.dynaproducts.com

In Europe contact: Barber-Colman GmbH

Am Neuen Rheinhafen 4, D-67346 Speyer, Germany
Telephone (49) 6232 29903, Facsimile (49) 6232 299155

In Japan contact: Ranco Japan Ltd.

Shiozaki Bldg. 7-1, 2-chome, Hirakawa-Cho, Chiyoda-Ku
Tokyo 102, Japan
Telephone (81) 3 3261 4293, Facsimile (81) 3 3264 4691